No. 8

タイ・モンクット王工科大学
計画打合せチーム報告書

昭和56年11月

国際協力事業団

はじめに

本プロジェクトは，モンクット王工科大学（ラートクラバン校舎）工学部拡充のために，わが国が昭和 53 年 12 月以来データ処理工学，半導体工学，電力工学の 3 分野においてプロジェクト方式の技術協力を実施しているものである。

モンクット王工科大学に対するわが国の協力は，昭和 36 年ノンプリー電気通信訓練センターに対するものに始まり，今日に至っている。この間同センターは拡大発展を遂げ，電気通信専門学校を経て，5 年制の大学へと成長した。

現行R／Dに基づく協力期間は昭和 57 年 12 月をもって終了するが，昭和 53 年 12 月の協力開始以来，現在までの協力実施状況を調査し，今後のプロジェクト運営のあり方を協議するため，今般当事業団は計画打合せチームを現地に派遣した。

本報告書は，同チームの現地における調査結果をまとめたものである。

最後に，本チームの派遣にご協力いただいた外務省，郵政省，日本電信電話公社，東海大学ならびに在タイ日本大使館の関係各位に対し，この機会を借りて深甚の謝意を表したい。

国際協力事業団
理事　中澤弐仁

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1. チームの構成，日程，面会者

1. 1　チームの構成

氏　名	担　当	現　職
福田　滋	総　括	郵政省大臣官房国際協力課国際協力調査官
小沢　斉	データ処理工学	日本電信電話公社海外連絡室調査役
山口　功	電力工学，半導体工学	東海大学工学部電気工学科助教授
青木利道	業務調整	国際協力事業団社会開発協力部海外センター課職員

1. 2　調査日程

月　日	移　動	調査内容
8月13日(木)	東京－バンコク (JL475)	
14日(金)		午前　JICAバンコク事務所表敬。 午後　KMIT表敬。 KMIT側に対し質問書提出。 施設見学(データ処理工学棟，半導体工学棟)。
15日(土)	バンコク	午前 午後　KMIT派遣専門家との協議
16日(日)	バンコク	資料整理
17日(月)	バンコク	午前　KMIT側との協議。 施設見学(電力工学棟，新コンピュータ棟)。 午後　DTEC表敬。 大使館表敬。
18日(火)	バンコク	午前　KMIT側との協議 午後　施設見学(電気通信棟)。
19日(水)	バンコク	午前 午後　KMIT側との協議。
20日(木)	バンコク	午前 午後　KMITにて，調査資料整理及び報告書作成。
21日(金)	バンコク	午前　大使館，JICA事務所に報告。
22日(土)	バンコク－東京 (CX712－CX500)	

1.3 主な面会者

DTEC (Department of Technical Economic Cooperation)

Mr. Kasem Unahasuvan	Deputy Director-general
Mr. Pracha Chaowasilp	Director of Colombo Plan Sub-Division
Mr. Surayuth Kungsadan	Member of Colombo Plan Sub-Division

KMIT (King Mongkut's Institute of Technology)

Prof. Boonyasak Jaijongkit	Rector
Prof. Prasom Rangsirochana	Vice Rector
Dr. Kosol Pethsuwan	Dean, Faculty of Engineering
Dr. Pairash Tajchayapong	Director, Computer Center
Mr. Chom Kimpan	Acting Head, Department of Computer and Control
Dr. Sitthichai Pookaiyaudom	Associate Dean, Faculty of Engineering, Head, Department of Electronics Engineering
Mr. Somkiat Supadech	Head, Electronics Research Center
Dr. Birasak Varasundharosoth	Head, Department of Electrical Engineering
Mr. Somchet Thiemmuang	Head, High Voltage and Power System Section

KMIT派遣 日本人専門家

加来億一	リーダー兼データ処理工学
佐藤和紀	半導体工学
内海達見	電力工学
木下一郎	業務調整

日本大使館

稲村公望 二等書記官

JICAバンコク事務所

河西 明 所長

川上兼弘 所員

2. プロジェクトの経緯とチーム派遣の目的

モンクット王工科大学ラートクラバン校舎（King Mongkut's Institule of Technology, Ladkrabang Campus, 以下KMITと略す）は，1960年日・タイ両国政府間で調印された電気通信訓練センター設置に関する協定に基づいて翌1961年に開設されたノンブリー電気通信訓練センターを前身とし，日本の技術協力を受けて電気通信分野（マイクロ・ウェーブ，搬送，線路，電信，電話，無線及び放送）における技術者，技能者の訓練，教育を行ってきた。1970年，5年制の工科大学に昇格，1975年には大学院修士課程が開設された。この間，1972年には日本の協力分野として新たにコンピュータ，制御及び電子回路の3分野が加えられた。

このように着実な発展を遂げたKMITは1976年，なお一層の拡充発展を目指して日本政府に対し，データ処理工学，半導体工学，電力工学の3分野における技術協力を要請してきた。

このタイ側からの要請を受けて，わが国は1978年8月事前調査チームを派遣して協力の実現可能性について調査，その結果を踏まえて同年12月派遣した実施協議チームがKMIT側との間でR/Dに署名し，上記3分野において4年間にわたる協力を開始した。

本計画打合せチームは，上記R/Dに基づく協力開始以後初めてKMITを訪れるチームであり，主な目的は協力開始から現在に至るまでの協力実施状況の調査，R/D期間内における協力を一層効率的なものとするための方策の検討であった。

本チームは調査方法として，本プロジェクトのこれまでの実績と現状とを把握し得ると思われる内容を盛り込んだ質問書を作成，これをKMIT側に提示し，KMIT側の回答をもとに質疑応答を行うとともに，派遣中の専門家から協力の現状等について聴取した。

3. 調 査 内 容

3.1 教育及び研究活動の現状

3.1.1 教育の現状

KMIT は3年までがテクニシャン課程で，1年は全員が共通の講義（社会，人文科学関係の講義は選択）を受け，2年，3年が機械科，電気科に分かれ，4年，5年の学士課程に進級して電気通信，電子，電気，コンピュータ制御，機械，産業の6工学科に分かれるようになっている。本プロジェクトが対象とする専門3分野（データ処理工学,半導体工学，電力工学）は広く工学部各学科学生の受講科目として，正規の講座に取り入れられている。最初の3ケ年間に受講すべき科目数は42科目（124単位）で，この内3分野の履修科目に占める率は26科目（72単位）である。3分野共，次の2ケ年間に受講すべき科目数は24科目（68単位）であり，履修科目に占める率は18科目（52単位）である。工学部学生が卒業するまでの5ケ年間に取得すべき単位数は190単位であるが，本プロジェクト協力に関連している開講科目の単位数は3分野共，126単位であるから教育活動の協力内容としては十分であると認められる。また，講義の受講者数は45名以下であり，きめ細かい教育が行なわれている。

次に，学生はその属する学科の何れであるかを問わず,興味ある分野の科目を受講し得る（例えば，通信工学科学生がコンピュータ関連の科目を履修できる）ことになっており，広汎な知識を身に付けることが出来るので，KMITの卒業生は就職上も有利であり，3分野共，100%の就職率を示している。特に，半導体工学分野では，近来KMITの声望が高く，タイ国半導体産業分野へは，その人材の80%をKMITが供給しているとの報告を受けた。

対象とする3分野は修士コース学生の受講科目としても大部分正規の講座に取り入れられており，工学部と同様，大学院生もまた属する専攻の何れであるかを問わず，興味ある他専攻科目を受講し得るようになっている。3分野全体で開講しているのは45科目（134単位）である。

3.1.2 教育に関する問題点

(1) KMITでは科目は画一的に半期講義で終了するようになっている。また，専門科目においては細分化された科目が多い。系統立った知識を与える面から見れば，科目を細分化せず，ある程度科目をまとめて通年講義にした方が良いと思われる。

(2) KMITの対応を見て，カリキュラム作成に対して日本人専門家が指導，助言を行なうことが望ましいと思われる。

以上の2点について問題はあるが，本プロジェクトが対象とする専門3分野共，教育活動に対する協力としては十分な貢献度が認められる。

3.1.3　研究活動の現状

3分野における研究発表件数は表1の通りである。データ処理工学及び半導体工学の分野

表1

	1978年	1979年	1980年	1981年8月
データ処理工学	8	7	9	8
半導体工学	3	2	1	4
電力工学	0	0	5	13

ではＩＥＥＥに論文を採択された程の力のあるものもある。次に，現在の研究テーマ数はデータ処理工学では１７テーマ，半導体工学では９テーマ，電力工学では１８テーマとなっている。各分野のテーマはバラエティに富んでいるが，中には，先進国においては研究の名に値しないものもある。しかし，タイ国においては初めて着手するテーマであり，初歩的なテーマと言えども，将来研究の力を養うという意味では意義があると認められる。

各分野の研究テーマの選定には，特に明確な理由はなく，ＫＭＩＴスタッフ（特に学科責任者クラス）が与えられた環境（自分の専攻，与えられた研究設備，予算，スタッフの数やレベル等）と世界の技術的動向から，可能な目ぼしいトピックスを随時取り上げている。また，研究の進め方としては，特に定期的な打合せは行なわず，必要の都度集まってディスカッションを行なっている。特定の者は多数の研究テーマに関与しているが，テーマ自体が期限付きである訳ではなく，ある時期はあるテーマに，またある時期には他のテーマに比重をかけるという具合に研究を進めているのが現状である。

(1)　データ処理工学での研究活動ではＫＭＩＴと協議した議事録に記された項目（ソフトウェアに関するものとして，タイ国におけるコンピュータの応用及びタイ国で必要なシステムの開発等，ハードウェアに関するものとして，データ通信，コンピュータ・ネットワーク，マイクロコンピュータの開発，ローカル通信のためのインターフェイス等，その他として，パターン認識）について取り組んでいる。マイクロプロセッサを利用したシングルボードマイクロコーピュータ，アナログ・ディジタル変換器等の開発，コンピュータによるランドサットのデータ解析，タイ文字のパターン認識の研究を行っており，今後，患者の病歴管理システム，音声パターン認識等の開発を行ないたいとしている。

(2)　半導体工学の研究活動では，派遣専門家の着任時点（１９７９．９）電気炉，純水製造装置が一部破損して使用不能の状態にあり，また，素材不足の為研究活動が行えず，カウンターパートのトレーニングを兼ねて，その時点で出来る小面積の太陽電池の予備実験から開始した。現在，上記装置も整備され，かつ，５５年度供与された純水製造装置も最近設備終了したので反射防止膜利用による太陽電池の高効率化及びフォトダイオードの試作に主力を注いでいる。

今後，バイポーラ形トランジスタ及びシリコン集積回路の製作技術も順次可能となろう。

なお，半導体関係の研究においては材料の入手が問題である。ＲＤ期間中は所要数確保されているものの，ＲＤ終了後の入手先については今後検討を要する問題である。

(3) 電力工学での研究活動ではその対象とする範囲が極めて広い為，電気機械，高電圧，パワーエレクトロニクス，照明，送配電に絞って研究を進めている。電気機械ではモータの制御，風力発電機，リニアモータに関する研究を行なっている。リニアモータは修士コースの研究指導の為，取り上げている。高電圧では，絶縁破壊に関する研究を行なっているが，電力棟のスペースとがい子の安全性の面から６００KV 直流高電圧試験装置がその機能を十分発揮していない（新超高圧棟は１９８２年５月に完成予定）。パワーエレクトロニクスでは未だ初歩的であり，研究はこれからという段階である。送配電では他大学においても余り研究されていないがＫＭＩＴでは現在，理論的研究を進めている。

エネルギー変換については風力エネルギーに関する研究を進めており，２５Ｗ発電機の基礎研究は終り，１KW発電機の設計も終了しているが，内貨予算不足で完成まで至っていない。

3.1.4 研究に関する問題点

(1) １人で多数のテーマを持っており（データ処理工学ではDr．Pairashが１２テーマ，半導体工学ではＳ．Supadechが８テーマ，電力工学ではＢ．Varasundhavosothが１０テーマ），力を集中できないと思われる。テーマは絞った方が良いと思われる。

(2) テーマの選定についてはアットランダムな面がある。テーマ選定に関してもう少し絞った方が良いと思われる。今後，長期的展望を立てて逐次計画に基づいて選定する方向にもって行くのが良いと思われる。

(3) 研究の進め方としてはグループで研究する体制を確立し，若手スタッフの育成が望まれる。

3.1.5 研究協力の評価測定

研究協力に対する評価は非常に困難な問題である。研究成果，つまり論文発表をもって成功とみなすか，または研究手法の移転をもって成功とみなすかについても議論の多いところである。論文発表をもって評価するならば，表１に見る通り，年を追って発表件数が増加しつつあり，また５５年度供与機材の設置が完了すれば研究活動がさらに促進され発表論文数も増加するものと思われる。短期間に成果が得がたいテーマ，特にＲＤ期間中に成果を望めないものに対しては研究手法の技術移転が進展しつつある状況から見て，研究活動に対する協力についても効果が上っていると思われる。

3.2 建物・供与機材の稼動状況

3.2.1 建物の状況

(1) 半導体工学，データ処理棟はR／Dの定めるところによりタイ側予算で建築することになっており1980年4月には完成する筈であった。しかしながら当初予算1,500万バーツ（1.5億円）を大幅に超えた設計がなされたため着工ができず，次年度（タイの会計年度は10月1日に始まる1年間）まわしになり，予算額約4,000万バーツ（約4億円）をもって1979年漸く着工に漕ぎつけることができた。

1981年8月の調査時点では外観は整い，データ処理機器室内装も完了し機器搬入が可能の状態と見受けられた。

ＪＩＣＡ55年度購送機材である半導体マスク製造装置，拡散炉，純水製造装置等は現地到着後永らく保管されたままとなっていたが8月下旬に据付けを開始した。

コンピュータ関係諸施設も狭隘をかこっていた現校舎から新築の棟内に移装される予定であり設備の環境条件は格段に改善されることが期待される。

(2) 電力工学棟は57年度購送予定の1,500KVインパルス発生装置の据付けを機会に新築が考えられており，既存の600KV直流高圧発生装置もそこへ移設される。600KV直流高圧発生装置は，現実験棟が十分な天井高にないため性能どおりのはたらきが叶わないでいるが，新実験棟は高さ17 m×横24 m×縦26 mの大きさとなる予定であり，この点も改善されよう。

3.2.2 機器の保守

コンピュータの保守についてはＫＭＩＴスタッフが予防保全を行なっており，通常の運転に支障はない。不時の故障についてはバンコク市内のデータマット社とOn call basisによる保守契約を結んであり，同社にはシンガポールの親会社，更には東京からのバックアップがある模様である。過去1年間に3回この社から出動して貰い1万バーツ（10万円）を支払った。コンピュータ保守については，ＫＭＩＴスタッフの技量が向上してきたこともあり今後ともこの体制でゆけるものと思われる。

保守用部品や消耗品，特に半導体工学で用いる薬品類についてはR／D期間中の所要量は確保されている。R／D期間終了後は，少量・多種類の薬品を円滑に入手するについて，その実現に一抹の懸念もあるが，その方法については検討中である。

なお，現在までにタイ側では本プロジェクトを進めてゆくために若干の支出をしており，その額はデータ処理工学で30万バーツ，半導体工学で20万バーツ，電力工学で40万バーツ合計90万バーツ（900万円）程である。

3.2.3　供与機材の稼動状況

日本政府からの供与機材は，５４年度に約１億3,800万円，５５年度約１億1,000万円，合計約２億4,800万円分が到着し，据付未了のものを除き工学部長もしくは学科主任クラスの管理下で丁寧に扱われ，利用されていた。

主要機材についてその稼動状況をみると下記のとおりである。

(1)　データ処理工学関係の機器は殆んどフル稼動の状態であった。但し全てが教育，研究用途であるというわけではなく，学生の事務管理資料やランドサットの図形解析のための所謂本来目的以外の用に供されているものも含まれている。

NEC SYSTEM 300	週５日使用
DATA ENTRY	週５日使用
HITAC SYSTEM 10	週４日使用

(2)　電力工学関係では主要計測器が日常使用されているが，なかには余り使用されていないものがあった。

各種計測器（鉄損，磁束　，回転，較正，ディジタル電力オシログラフ等）	週３日程度
自動捲線機	週３日程度
温度集録装置	殆んど使わない
600kV高圧発生装置	時に使用
50ｔ加圧機	殆んど使わない
直流磁気ヒステリシス曲線トレーサ	余り使わない

600KV高圧発生装置は設置場所の天井高不十分のため（前掲3.2.1(2)関連）500 KV以下で働らかせていた。５０ｔ強力プレスはモータ用の各種鉄心となる珪素鋼板を打抜くために供与されたものであるが，現地側では打抜く型を発注する費用の捻出が思うようにゆかず，折角の機械が遊休している。

磁気ヒステリシス曲線トレーサも同様に実験に供試する素材の用意が十分でなく利用度が低いようである。

この場合の素材といいプレスの場合の抜き型といい大学側が真に必要とするものはたとえ財源が乏しくともその中から優先的にこれを捻出する筈であると考えられることから，機材供与に際しては必要性，利用度，据付後の維持方法（費用を含む）などをよく検討して決めることがのぞましい。特にプレスの類は抜型を設計し市内業者に打抜きを外注する方法もあったのではなかろうか。

(3)　半導体工学で使用するマスク製造装置，純水製造装置及び拡散炉（５５年度供与機材）は3.2.1(1)で述べたようにタイ側でこれを収容する建物の建築が遅延したために調査時点では運転状態になかった。

3.3 カウンタパートの現状

3.3.1 人　数

ラートクラバン校舎工学部の構成は学士課程として，電気通信，電気，電子，機械，コンピュータ制御および産業の6学科，並びに大学院修士課程となっていて工学部教官の総数は約80名である。

プロジェクトのカウンターパートは，派遣専門家と常時接触を保ちながら技術移転を授かり専門家がその任を離れた後これにとってかわることができる者を云うのであるが，本プロジェクトの場合，大学側ではＫＭＩＴ教官で技術協力対象の3分野に関係がある者全員をカウンターパートとしてR／D当初から計上していたので同じ考えで整理すると調査時点でのカウンターパート総数は42名である。

カウンターパート数

	56年8月	R/D開始時
データ処理工学	18	20
半導体工学	9	16
電力工学	15	11
合計	42	47

工学部が抱える教官の総数は約80名であるからその過半数がカウンターパートということになり，人数だけは多い。しかしながら現在日本の大学へ長期留学中の者（2名）や，KMITに置席しているがＫＭＩＴの仕事をしていない者（2名），更には学部卒業直後の者多数がこの数値の中に含まれているので，プロジェクトを推進する力のある，真の意味でのカウンターパートは上記42名の1/3程度になってしまう。

3.3.2 質的構成

ＫＭＩＴでは学長と副学長（学長室と3キャンパス各1名の計4名）の職にある者だけが教授であり，工学部長と以下各学科主任は助教授の肩書きである。各学科主任は博士もしくは修士号を持つ30才台の研究者であるが概して若い人が多く，今年のＫＭＩＴ学士課程卒業生が多数居ることから，カウンターパートの平均年令は下がり28才になる。

カウンターパートの学歴

分　野　別	D	M	B以下	計
データ処理工学	2	4	12	18
半導体工学	1	2	6	9
電　力　工　学	2	5	8	15
合　　計	5	11	26	42

ここで目につくことは若年層カウンターパートの定着率が低いことである。昨年，一昨年の卒業者が殆んどいないことから卒業後暫時腰かけ的に大学に残り，比較的高給の得られる民間企業へ脱け出してゆく者がかなりあるとみられる。今年卒業の新カウンターパートからも若干の目減りは当然あるものと考えなければならない。

技術移転を満足に行なうためには優れたカウンターパートを多数揃えることが望まれ，派遣専門家側からその増員を強く申し入れている模様であり，大学側も来年度8名増員したいといっているが，将来大学の教官たらんとする優れた卒業生を精選し，定着率をあげて質の確保に努める必要があろう。

カウンターパートの年令構成

年令層	人　数	比　率（%）
40才以上	2名	4.8
35	4	9.5
30	10	23.8
25	11	26.2
20	15	35.7
計	42	100.0

またベテラン教官と若年層カウンターパートとの間に数年の断層がある。知識経験と指導力を要求される大学教官は年令構成上からも平準化されるような育成が肝要と思われる。

3.3.3　教育・研究時間

カウンターパート各人は教官として学生への講義や実習指導を行なっているが，その状況をみると次表のとおりであり，多くの時間数をこれに充てている。

週あたり平均の講義，実習指導時間数

分野別	講　義	実　習	合　計
データ処理工学	8	7	15
半導体工学	5	23	28
電力工学	3	16	19

若年層カウンターパートの中には殆んど教壇に立たない者が多いから，ベテラン層のカウンターパートの負担はかなり高く，週30時間を超える者も多く，これでは腰を落ちつけて研究することが難しいと思われるものが少なくない。研究活動を充実させるためには一段とスタッフ増員の要がある。

3.3.4　日本における研修

(1)　カウンターパートについてはＪＩＣＡ研修員として日本での研修に便宜をはかっており，ＫＭＩＴ教官の中には日本の大学で修士号を受けた者がかなりの数にのぼる。その殆んどはR/D署名以前ではあるが，東海大学で7名，日本大学で1名の8名であり，このうち東海大の修士2名は現在日本の文部省留学生としてパターン認識（広島大学）及び制御工学（東北大学）を履修中で，Ph．D. を目指している。

現在のところＫＭＩＴでは工学博士号を持つ研究者は3分野あわせて5名（データ処理工学電力工学各2名，半導体工学1名）だけであり，履修国別が英国3名，オーストラリア2名となっている。

工学部内の指導者層はこれら博士号取得者だけのグループで占められており，学内運営の重要事項や研究の方向はこの博士グループが決めていることから，今後日本で学位を得る者が台頭し，学内で指導者陣に加わり，研究推進の原動力になりうれば，その活動は刮目して期待されるところである。

(2)　カウンターパートの日本における研修は概ね成果をあげていると認められるが，中には大学側における対象者の選定に難があり，結果的に期待どおりにゆかなかった例があった。すなわち，半導体工学の東海大学における研修員は3年間の予定であったところ1カ月程で帰国してしまった場合があった。原因はノイローゼともいわれているが，若い既婚者の場合，余程意志強固且つ意欲的な者でないと異国の研修に支障があると思われる。

また，データ処理工学のあるカウンターパートの場合，ＡＣＯＳ－4ソフトウェアの3カ月研修修了し6カ月（義務期間）経過後，高給が得られる民間会社へ移った。教官の待遇が悪く民間企業に魅力を感ずるような状態は好ましくない。さりとて職業選択の自由もまた存在を否定し得ないし教官処遇の改善がのぞまれる。

さらに，半導体工学研修で受入れた筈のあるカウンターパートの場合，受入れ先のメーカーとの話し合いで勝手にテーマを変更して，Bio Medical の勉強をして帰国した。この場合，受入れ先が安易に日本人の希望を容れたものか；半導体のノウハウ流出を懸念した結果であるかは不明であるが，とりきめられたテーマである半導体から逸脱して別の研修を行なったことは問題がある。

以上のようにカウンターパートには未だ，意識，定着性など改善を要する問題点がある。良質のカウンターパートを得るためには何といっても処遇がよくならなければ困難があろう。長い目でみて優れた教官が育成されるためには大学教官として研究の熱意に燃える者を厳選し，比較的長期にわたって修士，博士課程で研修させるようにし，従って研修後の義務年限も長くなり定着が図れるようにもってゆくことがのぞましいと考える。

ＪＩＣＡ研修員として日本で研修を受けたＫＭＩＴ教官

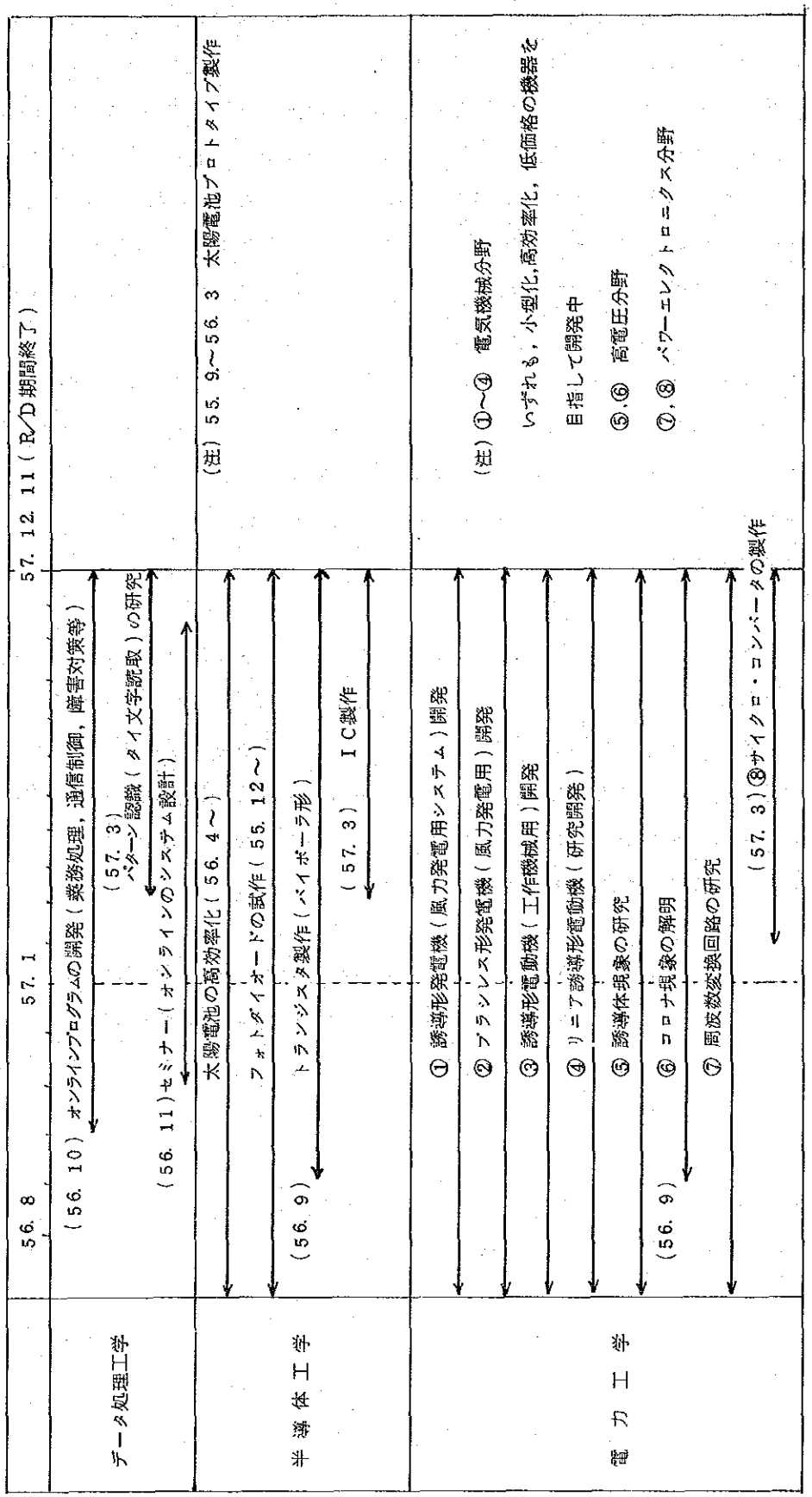
（56年8月調べ）

項目 / 分野別	修士課程卒業	短期の研修
データ処理工学	＊Mr. Chom ＊Mr. Pratheep ＊Mr. Kanchit 1) ＊Mr. Paison 2)	Mr. Chom Mr. Chom Mr. Boomwat ＊Dr. Kosol Dr. Pairash (Mr. Vorannwoot) (Mr. Sinchai)
	4名	7名
半導体工学	＊Mr. Somkiat ＊Mr. Manas	Mr. Manas 3) Mr. Itthichai
	2名	2名
電力工学	＊Mr. Somchet ＊Mr. Hok	＊Mr. Nithad Miss Wandee
	2名	2名
合計	8名	11名

＊　R/D調印以前に研修を受けた者

1）現在広島大学博士課程留学中である。
2）現在東北大学博士課程留学中である。
3）指定されたテーマを変更し異なった研修をした。

4. R／D 期間終了時までの研究教育指導計画



5 結 論

ＫＭＩＴは，特にコンピュータや半導体製造諸装置，その他日本からの機材供与を得て，タイ有数の大学に成長しつつある。しかし，R/D 締結の際に予定した３分野に対する技術協力スケジュールについては，発展途上国にありがちな内貨予算の不足に因る建物の建設の遅れやカウンターパートの不足があり，約１年間の遅れで実施されている状況である。ただし，その遅延はＫＭＩＴ関係者の懸命な予算獲得の努力にかかわらず避けられなかったものと認められた。

従って，十分な技術移転を図るためには，上記の事情に加えてこの３分野が最先端技術に関連するものであってタイの学界にとっては未知の技術分野に属することも考慮し，センター協力期間を１～２年延長し，協力の実をあげることが望ましいと考えられる。

今回の相互打合せにおいて調査団が本プロジェクトの実施上考慮すべきであると考えさせられた事項を次に掲げる。

(1) 本プロジェクトによる技術協力は，単に３分野に対する教育のみならずその研究開発をも含むものとしている。しかし，後者に関する成果については先進国においても容易に達成されるものではなく，まして開発途上国においては目ざましい成果を早急に期待できるものでなく，長い目で見るべき性質のものであろう。また，開発途上国における研究開発の実施について，関係技術が先端的なものであればあるほどインフラの未成熟及び周辺産業の不存在が研究成果に影響を及ぼさないよう配慮すべきものと考える。

(2) R/D による電気通信分野における協力という趣旨の下に，技術協力の内容に電力工学のような対象の広いものを取込む場合には，対象とするテーマ，供与する機材，派遣専門家の人選及びプロジェクトの狙い等の相互間に一貫性を持たすことが重要であろう。これがないと，現地での指導は困難となり十分な効果を挙げ難いと考える。

(3) すでに技術移転が成功裡に終了したとして 1965 年（昭和 40 年）にセンター協定を打ち切られＫＭＩＴの母体となっている電気通信工学部には，経年により時代遅れとなったＳＸＳ交換機，メカニカルテレプリンターなどが主力機器となっている。

大学は原理的研究で足りるとの原則論はあるとしても，全く異なる原理によって作成された最新の電気通信機器が大宗を占めるに至った現在，実務教育に伝統的強みを持つKMITの特色を活かさせるためには，電気通信機器の補充も考慮すべきと考える。

今回の相互打合せにおいて，調査団は，資料収集のため約 30 項目にわたる質問事項を一定のフォーマットにより回答させる方式をとった。これに対し，ＫＭＩＴ側はKosol工学部長を先頭に全面的に協力を行ない，短期間にすべての回答を作成した。このような迅速な対応は通常期待できないものと思われ，改めて積年の技術協力に対するＫＭＩＴ側の謝意の表われと感銘を受けた。

付属資料（Ｉ）

計画打合せチーム提出のＫＭＩＴに
対する質問書

To Dr. Kosol Petchsuwan
Dean, Faculty of Engineering,
King Mongkit's Institute of Technology

14, Aug. 1981

From Shigeru Fukuda
Mutual Consultation Team, JICA

As the Mutual Consultation Team for the Technical Cooperation Project of King Mongkut's Institute of Technology, we would like you to fill in this series of questions. Please refer to the attached tables.

Since we are leaving Thailand on 22nd of this month, we would appreciate it if you could have the questionnaire back to us at the earliest possible date so that we may discuss any subject they reveal.

Q-1 In regard to the implementation of Master Plan of the Project, please reply to the following questions;

Q-1-1; How many lectures and credits related to Data Processing Technology, Solid-state Technology, and Electrical Engineering, did the students take in the 1981 academic year? Table 1.

Q-1-2; What are the research themes at this moment? Please list them on Table 2.

Q-1-3; List the papers submitted to third institutions on your convenient format. If there are any themes connected with the Project, please indicate them.

Q-1-4; List the number of graduates from the Faculty of Engineering in each year. Does KMIT have plans for expansion in the future? If so, estimate their number on Table 3.

Q-2 As for the counterpart staff, please reply to the following questions;

Q-2-1; List the counterpart staff on Table 4.

Q-2-2; Describe the research and educational activities for each member of the counterpart staff on Table 5.

Q-2-3; List the number of counterpart staff who have studied in Japan since 1978, on Table 6.

Q-2-4; List the former counterpart staff members with the reasons for leaving the job, on Table 7.

Q-2-5; List the number of counterpart staff each year since 1978, on Table 8.

Q-3 Your comment please, to the following six items about the buildings.

Q-3-1; According to item 1.1 of the minutes, the building for Solid-states and Data Processing Technology should have been finished about April 1980. However, we understand there have been delay. Has the building been completed? Can the installation of equipment be started?

Q-3-2; Does the new computer room satisfactorily meet the humidity requirements for computers?

Q-3-3; The minutes (item 1.1) also state that electrical engineering building has been completed. Does this building meet the size and safety requirements of the 600 KV D.C. high voltage generator, as well as the 1500 KV impulse generator? If the building does not now meet these requirements, can KMIT modify the building?

Q-3-4; Can KMIT get 3ϕ 200 volt and single phase 100 volt commercial power?

Q-3-5; Is the space for air conditioning units in the Solid states laboratory available?

Q-3-6; Please draw the layout of the Solid-states Laboratory where new articles are to be installed soon.

Q-4 As to operation and maintenance, please reply to the followings.

Q-4-1; How does KMIT manage computer maintenance? Do staff do preventive maintenance on their own? What are the maintenance expenses? Do you have a maintenance contract?

Q-4-2; Please list the mechanical problems you have had with the computer system on Table 9.

Q-4-3; Is the computer system exclusively used for research and educational purposes? How does KMIT control this? Please give us a list of computer use on Table 10.

Q-4-4; Is the commercial power supply stable? How often does power failure occur? Please list all power failures you have experienced in each month for the past year on Table 11.

Q-5; As for the expenditures borne by the Thai government in running this Project, are they increasing year by year? Please reply on the Table 12 and 13.

Q-6; How often does KMIT use the equipment we have supplied? Please list these answers in Table 15 and 16. Part of these questions are related to Q-3.

Q-7; In connection with the topic of Research;

Q-7-1; In item 5.1 (4) of the minutes, under Solid-state technology, what does the phrase" to cooperate with industries" mean? Does it mean by which KMIT can promote its research activity, or an ultimate objective? What is the aim of this article?

Q-7-2; Research and development activities of Pattern Recognition require considerable manpower. Does KMIT have any plans for increasing the number of the counterpart staff in this field upon implementing the Project?

Q-7-3; Can KMIT procure its own consumables for researches in Solid-states Technology after the period of cooperation is over?

Q-8; Others

Q-8-1; Does KMIT have any mutual cooperation agreements with other technological institutions either domestic or abroad?
This cooperation does not necessarily to be limited to the three fields covered in the Project.

Q-8-2; Does KMIT have any request for the Japanese experts?

QUESTIONNAIRE

Item	No.	Contents	Table No.
1. Implementation of Master Plan	Q.1-1	Lecture and Credit taken by Students	1
	Q.1-2	List of Research Theme	2
	Q.1-3	List of Papers or Reports	
	Q.1-4	Number of Students in the Faculty of Engineering	3
2. Counterpart Staff	Q.2-1	List of Counterpart Staff	4
	Q.2-2	Research & Educational Activities for each Counterpart	5
	Q.2-3	List of Staff who have studied in Japan	6
	Q.2-4	Ex-Counterpart Staff	7
	Q.2-5	Number of Counterpart Staff	8
3. Building and Incidental Facilities	Q.3-1	Solid-state & Data Processing Bldg.	
	Q.3-2	New Computer Bldg.	
	Q.3-3	Modification of Electrical E. Bldg.	
	Q.3-4	Provision of 3ø 200 volt, 1ø 100 volt	
	Q.3-5	Room Space for Air Conditioning in Solid-state Laboratory	
	Q.3-6	Installation Layout of Solid-state Laboratory	
4. Operation and Maintenance	Q.4-1	Maintenance Condition of Computer	
	Q.4-2	Trouble Record of Computer	9
	Q.4-3	Calculation Time by Each Personnel	10
	Q.4-4	Stability of Commercial Power Supply	11
5. Expenditure, Spare Parts, etc.	Q.5-1	Expenditure Borne by the Thai Government	12
	Q.5-2	Consumables Purchased for the Project	13
6. Utilization of the Equipments	Q.6-1	Utilization of the Equipments	14
	Q.6-2	Use of DISC Memory	15
	Q.6-3	Reasons for Poor Utilization of the Equipments	
7. Topics of Study	Q.7-1	What is the Aim of Cooperation with Industries?	
	Q.7-2	Does KMIT have the Idea of Increasing the Number of Counterpart?	
	Q.7-3	Prospect of Purchasing Consumables	
8. Others	Q.8-1	Mutual Cooperation with Other Technological Institutions	
	Q.8-2	Request for the Japanese Counterparts	

付属資料（Ⅱ）

質問書に対するＫＭＩＴ側の回答

Report on the Results of Implementation

of the Cooperation Project to KMIT

between 1978 - mid 1981

Faculty of Engineering

KMIT Ladkrabang

August 20, 1981

Contents

Attached Drawing

1. Layout of the HV building
2. Layout of the SS Laboratory

(Table 1) A-1 The Implementation of the Master Plan of the Project

A-1-1 Lecture and Credit

Academic Year of 1981

Field	Title of Lecture	Credit	Number of students taking lecture						
			Telecom-munications	Electrical E.	Electronics	Computer & Control	Mechanical E.	Industrial Tech.	Total
Data Processing Tech.	Bacheler of Engineering								
	FORTRAN Programming	1	40	40	45	45	15	15	200
	COBOL Programming	1	40	40	45	45	15	15	200
	Engineering Laboratory I	2	40	40	45	45	15	15	200
	Numerical Computation and Programming	3	35	35	40	40	15	15	180
	Degital Logic Design	3	35	35	40	40	-	15	165
	Engineering Laboratory II	2	35	35	40	40	-	15	165
	Microprocessors	3	35	35	40	40	-	15	165
	Switching Theory	3	10	10	10	40	-	-	70
	Programming Languages	3	10	10	10	40	-	-	70
	Data Communication	3	35	10	10	40	-	-	95
	Engineering Laboratory II	2	35	35	40	40	-	15	165
	Operating Systems	3	10	5	5	40	-	-	60
	Operations Research	3	15	15	15	40	-	-	85
	Assembler Languages	3	5	5	5	25	-	-	40
	Applied Microprocessors	3	20	20	20	40	-	-	100

(Table 1)

Lecture and Credit

Academic Year of 1981

Field	Title of Lecture	Credit	Number of students taking lecture						
			Telecommunications	Electrical E.	Electronics	Computer & Control	Mechanical E.	Industrial Tech.	Total
Data Processing Tech.	Database Management	3	5	5	5	20	-	-	35
	Compliers	3	5	5	5	15	-	-	30
	Remote Sensing	3	15	10	10	40	-	-	75
	Microprogramming	3	5	5	5	25	-	-	40
	Graduation Projects	3	-	-	-	40	-	-	40
	Master of Engineering								
	Graduate Seminar	3	-	-	-	5	-	-	5
	Experimentation and Seminar I	3	-	-	-	5	-	-	5
	Experimentation and Seminar II	3	-	-	-	5	-	-	5
	Master Thesis	3	-	-	-	5	-	-	5
	Computational Methods	3	5	5	5	5	-	-	20
	Mathematical Analysis	3	-	-	-	5	-	-	5
	Applied Mathematics	3	-	-	-	5	-	-	5
	Orthogonal Transforms for Digital Signal Processing	3	5	-	5	5	-	-	15
	Digital Image Processing	3	5	-	-	5	-	-	10
	Automata Theory	3	-	-	-	5	-	-	5

(Table 1)

Lecture and Credit

Academic Year of 1981

Field	Title of Lecture	Credit	Number of students taking lecture						
			Telecom-munications	Electrical E.	Electronics	Computer & Control	Mechanical E.	Industrial Tech.	Total
Data Processing Tech.	Modern Control Theory	3	–	5	–	5	–	–	10
	Discrete Signal Processing I	3	5	–	–	5	–	–	10
	Discrete Signal Processing II	3	5	–	–	5	–	–	10
	Random Variables and Processes	3	–	–	–	5	–	–	5
	Microcomputer-Based Design	3	5	5	5	5	–	–	20
	Information Theory	3	5	–	–	5	–	–	10
	Pattern Recognition	3	–	–	–	5	–	–	5
	Learning Machine	3	–	–	–	5	–	–	5
Solid-state Tech.	Bachelor of Engineering								
	Electronic Circuits I	4	35	35	40	40	–	15	165
	Electronic Circuits II	4	35	35	40	40	–	15	165
	Eng. Lab. I	2	35	35	40	40	–	15	165
	Eng. Lab. II	2	35	35	40	40	–	15	165
	Semiconductor Theory	3	5	5	30	5	–	–	45
	Semiconductor Devices I	3	5	5	30	5	–	–	45

(Table 1)

Lecture and Credit

Academic Year of 1981

Field	Title of Lecture	Credit	Number of students taking lecture						
			Telecommunications	Electrical E.	Electronics	Computer & Control	Mechanical E.	Industrial Tech.	Total
Solid-state Tech.	MOS IC Design	3	–	–	30	–	–	–	30
	Laboratory I	2	35	35	40	40	–	–	150
	Pulse Engineering	3	5	5	25	5	–	–	40
	Solid State Motor Control	3	5	5	10	10	–	–	30
	Electrical and Magnetic Materials I	3	5	5	15	5	–	–	30
	Electrical and Magnetic Materials II	3	5	5	15	5	–	–	30
	Integrated Circuits I	3	5	5	30	5	–	–	45
	Semiconductor Devices II	3	–	–	30	–	–	–	30
	Graduation Projects	6	–	–	30	–	–	–	30
	Master of Engineering								
	Graduate Seminar	3	–	–	5	–	–	–	5
	Experimentation & Seminar I	3	–	–	5	–	–	–	5
	Experimentation & Seminar II	3	–	–	5	–	–	–	5
	Basic Semiconductor Devices	3	3	3	5	4	–	–	15
	Integrated Circuit Techniques	3	3	3	5	4	–	–	15

(Table 1)

Lecture and Credit

Academic Year of 1981

Field	Title of Lecture	Credit	Number of students taking lecture						
			Telecom-municat-ions	Electric-cal E.	Electro-nics	Computer & Control	Mechani-cal E.	Industri-al Tech.	Total
Solid-state Tech.	Integrated Circuit Device Theory & Fabrication	3	3	3	5	4	–	–	15
	Semiconductor Physics	3	3	3	5	4	–	–	15
	MOS Devices	3	3	3	5	4	–	–	15
	MOS IC	3	3	3	5	4	–	–	15
	Quantum Electronics	3	3	3	5	4	–	–	15
	Advanced Semi-conductor Devices	3	3	3	5	4	–	–	15
	Opto-Electronics	3	3	3	5	4	–	–	15
Electrical E.	Mathematics I, II, III, IV	4	40	40	45	45	15	15	200
	Physics I, II	5	40	40	45	45	15	15	200
	Chemistry I, II, III	3	40	40	45	45	15	15	200
	Engineering Workshop I, II	2	40	40	45	45	15	15	200
	Engineering Drawing	2	40	40	45	45	15	15	200
	Engineering Mechanics	3	40	40	45	45	15	15	200
	Thermodynamics	3	40	40	45	45	15	15	200
	Fluid Mechanics	3	40	40	45	45	15	15	200
	Mechanic of Solids	3	40	40	45	45	15	15	200

(Table 1)

Lecture and Credit

Academic Year of 1981

Field	Title of Lecture	Credit	Number of students taking lecture						
			Telecom-munications	Electri-Cal E.	Electro-nics	Computer & Control	Mechani-cal E.	Industri-al Tech.	Total
Electrical E.	Electrical Engineering I, II	4	40	40	45	45	15	15	200
	Electromagnetics	3	40	40	45	45	15	15	200
	Electrical Machines I, II	4	40	40	45	45	15	15	200
	Numerical Computation and Programming	3	35	35	40	40	15	15	180
	Network Theory	3	35	35	40	40	–	15	165
	Electronic Circuit	4	35	35	40	40	–	15	165
	Lighting and Electrical System Design	3	15	40	15	15	–	–	85
	Power System I, II	3	15	40	15	15	–	–	85
	Transformers	3	15	40	15	15	–	–	85
	Generalized Theory of Electrical Machine	3	15	40	15	15	–	–	85
	Power Electronics	3	15	40	15	15	–	–	85
	High Voltage Technology	3	15	40	10	10	10	–	85
	Electrical Power Plants and Substation	3	15	40	10	10	10	10	95
	Material Sciences	3	15	40	–	–	–	15	70
	Switch Gears	3	5	40	5	5	5	5	65

(Table 1)

Lecture and Credit

Field	Title of Lecture	Credit	Telecom-munications	Electrical E.	Electronics	Computer & Control	Mechanical E.	Industrial Tech.	Total
Electrical E.	Electrical Estimation and Design	3	10	40	10	10	10	10	90
	Electrochemical Engineering	3	–	40	5	–	10	10	65
	Electrical Machine Design	3	5	40	5	5	10	10	75
	Introduction to Linear Electrical Machines	3	5	40	5	5	10	10	75
	Energy Conversion and Environmental Technology	3	5	40	5	5	10	10	75
	Nuclear Power Engineering	3	5	40	5	5	10	10	75
	Theory of Dielectric Phenomena	3	5	40	5	5	10	10	75
	Laboratory I, II	3	5	40	35	35	15	15	175
	Project, I, II	3	–	40	–	–	–	–	40
	Master of Engineering								
	Graduate Seminar	3	–	5	–	–	–	–	5
	Experimentation & Seminar I	3	–	5	–	–	–	–	5
	Experimentation & Seminar II	3	–	5	–	–	–	–	5
	Master Thesis	3	–	5	–	–	–	–	5

(Table 1)

Lecture and Credit

Academic Year of 1981

Field	Title of Lecture	Credit	Number of students taking lecture						
			Telecom-municat-ions	Electri-cal E.	Electro-nics	Computer & Control	Mechani-cal E.	Industri-al Tech.	Total
Electrical E.	Unified Theory of Electromagnetic Machines	3	-	5	-	-	-	-	5
	Induction Machines	3	-	5	-	-	-	-	5
	Selected Topics of Electrical Machines	3	-	5	-	-	-	-	5
	Electromechanical Energy Conversion Discharge	3	-	5	-	-	-	-	5
	Simulation and Modelization	3	-	5	-	-	-	-	5
	Advanced High Voltage Technology	3	-	5	-	-	-	-	5
	Advanced Power Electronics	3	-	5	-	-	-	-	5
	Advanced Linear Machines	3	-	5	-	-	-	-	5

(Table 2)

A-1-2 List of Research Theme

Field		Name of Topic	Period	Name of Staff
Data Processing Tech.		Pattern Recognition		
	1)	LANDSAT Pattern Recognition with Applications	1980	Dr. Kosol Dr. Pairash Mr. Kanchit Mr. Warawoot Mr. Supachoke
	2)	LANDSAT Data Reduction with Applications to Efficient Storage and Transmission	1980	Dr. Kosol Dr. Pairash Mr. Chom
	3)	LANDSAT Image Enhancement using Orthogonal Transforms	1980	Dr. Pairash Dr. Kosol Mr. Kanchit
	4)	Thai Character Pattern Recognition	1979	Mr. Chom
	5)	Two-Dimensional Digital Filters for Image Processing	1976	Dr. Pairash
		Computer Network		
	6)	In-house Computer Network	1979	Dr. Kosol Mr. Prateep
	7)	Inter-University Computer Network	1980	Dr. Kosol Mr. Boonwat
		Digital Signal Processing		
	8)	One-Dimensional Digital Filters	1976	Dr. Pairash
	9)	Image Reconstruction	1980	Dr. Pairash
		Administration Applications		
	10)	KMIT/REGIS-I Student Registration Package	1980-1981	Dr. Pairash Mr. Wootichai Miss Kittima

(Table 2)

List of Research Theme

	Field	Name of Topic	Period	Name of Staff
Data Processing Tech.	11)	Library Applications	1980	Mr. Prateep
	12)	Development of In-Patiant Statistical Package for Hospitals	1981	Dr. Pairash Mr. Wootichai Miss Kittima
		Microprocessor Research		
	13)	Development of Signal Board Microcomputer using Z-80 Microprocessors	1978	Dr. Pairash Mr. Manoon Mr. Puttaporn Mr. Paisan
	14)	Microprocessor-based Data Acquisition Systems	1978	Dr. Pairash Mr. Manoon Mr. Somkial
	15)	Microprocessor-based Controller	1978	Dr. Pairash Mr. Thanachai Mr. Paibool
	16)	Traffic Light Controller	1978	Mr. Chom Mr. Paisan
	17)	Language Interpreter	1978	Dr. Pairash Mr. Puttaporn

(Table 2)

List of Research Theme

Field		Name of Topic	Period	Name of Staff
Solid-state Tech.	1)	Research, Design, Fabrication and Development of Silicon Solar Cells	1978	S. Supadech S. Wongmetta M. Sangworasit
	2)	Effect of Contact Grid Pattern on Silicon Solar Cells Performance	1978	S. Supadech S. Wongmetta S. Atchareeworakul
	3)	Breakdown Phenomena in Silicon p.n. Junction"	1978	S. Supadech W. Titiroongruang
	4)	Design and Fabrication of Silicon Photo Diodes	1978	K. Sato S. Supadech I. Arunsrisangchai J. Suppatvech
	5)	Design and Fabrication of Avalance Photo Diodes	1978	S. Supadech I. Arunsrisangchai
	6)	Measurement of Junction Depth	1978	S. Supadech S. Cheairsirikul B. Wongwatananura
	7)	Design and Fabrication of Bipolar Transister	1978	S. Supadech I. Arunsrisangchai K. Chitsakul
	8)	Design and Fabrication of MOS Transistor	1978	S. Supadech P. Kusirivanischayakorn M. Sangworasil

(Table 2)

List of Research Theme

Field		Name of Topic	Period	Name of Staff
Electrical E.	1)	Suboptimum Load Frequency Control	1978	C. Pooripawyawanich
	2)	Arc Discharge in Air	1978	N. Sukhum N. Nualnom S. Leartsupakul and A. Rantanakarn
	3)	Light Distribution Measurement Equipment	1978	W. Wuthiwatana S. Guyai A. Ploysanwan C. Sae-yas
	4)	The Single-phase Travelling Wave Linear Induction Machine-An Introduction	1978	B. Varasundharosoth
	5)	The Single-phase Travelling Wave Linear Induction Machine Design Criteria	1978	B. Varasundharosoth
	6)	Variable-Speed Single-phase Induction Motor Using Capacitors	1978	K. Masratana
	7)	Linknet-A Structure for Computer Representation of Network	1978	S. Prapai C. Pooripanyawanich
	8)	Characteristics of Annular Linear Induction Pump	1978	Prof. T. Utsumi
	9)	A Voltage and Motor Protector	1978	R. Pukdurong P. Petchjatuporn S. Pookaiudom B. Varasundharosoth
	10)	A Controller for Power Factor System's Correction	1978	N. Amornkul P. Petchjatuporn B. Varasundharosoth S. Pookaiudom
	11)	Variable Speed Linear Induction Motor	1978	B. Varasunolharosoth

(Table 2)

List of Research Theme

Field		Name of Topic	Period	Name of Staff
Electrical E.	12)	An Induction Generator System for Wind Turbine	1978	B. Varasundharosoth T. Atasaet N. Amornkul P. Prisuwanna
	13)	Faraday's Disc Motor-A Prototype	1978	B. Varasundharosoth P. Prisuwanna
	14)	Experimental Characteristies of a Self-Excited Brushless Single-phase Alternator	1978	P. Prisuwanna M. Srisom-on P. Srisurangkul B. Varasundharosoth
	15)	Line Voltage Regulator	1978	P. Prisuwanna B. Varasundharosoth
	16)	Self-Oscillating Linear Induction Motors	1978	M. Saelee P. Viriyawatana B. Varasundharosoth
	17)	Glow Discharge	1978	N. Sukhum
	18)	Streamer Propagation in Compressed Gases	1978	S. Thiemmuang

A-1-3 List of the papers submitted to third institutions

Published Papers on Data Processing Technology

1) K. Petchsuwan, P. Thajchayapong, K. Maitree "Landsat Image Processing by NEC ACOS-4" Presented at - 1st ASEAN Remote sensing Conf., Oct. 1980 Bangkok, Thailand.

2) K. Petchsuwan, P. Thajchayapong, Varavoot, Supachoke, "Landsat Image Processing of Chumporn Campus, submitted to 2nd ASEAN Remote sensing Conf. at Beijing, Oct. 1981.

3) P. THAJCHAYAPONG, I. ENDO and SUWATANAPANKUL, "Transitional Butterworth-Chebyshev filters: further design study. INT. J. Electronics, 1980, VOL. 49 NO. 2, 161-166.

4) P. THAJCHAYAPONG, M. PUANGPOOL, and S. BANJONGJIT, "A Chebyshev IIR lowpass digital filter with adjustable cut-off rate INT. J. ELECTRONICS, 1980, VOL. 49, NO. 4, 301-305.

5) P. THAJCHAYAPONG and F. CHEEV ASUVIT, "FILTER Coefficients of high-pass and band-elimination recursive digital filters with a maximally flat group delay, INT. J. ELECTRONICS, 1979, VOL. 47, NO. 4, 365-371.

6) P. THAJCHAYAPONG and P. LOMTONG, "Transition between a flat magnitude and a sharp cut-off lowpass filter. INT. J. ELECTRONICS, 1979, VOL. 46, NO. 1, 91-95.

7) P. THAJCHAYAPONG and P. LOMTONG, A Maximally Flat Group Delay Recursive Digital Filter with Controllable Magnitude, IEEE TRANS. Circuits and Systems VOL. CAS-25, NO. 1, JANUARY 1978.

8) P. THAJCHAYAPONG and P. LOMTONG, A Maximally Flat Group Delay Recursive Digital Filter with Chebyshev Stopband Attenuation. Proc. IEEE, VOL. 66, NO. 2, FEBRUARY 1978.

9) P. THAJCHAYAPONG and P. LOMTONG, Flat Magnitude Low-Pass Filters with a Pair of Imaginary-Axis Zeros Proc. IEEE, VOL. 66, NO. 5, MAY 1978.

10) P. THAJCHAYAPONG, Flat Magnitude LOW-PASS Filters with Multiple Pairs of Imaginary-Axis Zeros. Proc. IEEE, VOL. 66, NO. 10, OCTOBER 1978.

11) P. THAJCHAYAPONG, F. CHEEVASUVIT, and P. KARNCHANAWADEE, An Alternative Simultaneous Maximally Flat Approximation for a LOW-PASS Recursive Digital Filter, Proc. IEEE, VOL. 67, NO. 3, MARCH 1979.

12) P. THAJCHAYAPONG, P. KARNCHANAWADEE, and P. CHEEVASUVIT, A Recursive Digital Filter with Simultaneous Maximally Flat Magnitude and Group Delay at an Arbitrary Specified Frequency. Proc. IEEE, VOL. 67, NO. 5, MAY 1979.

13) P. THAJCHAYAPONG, F. CHEEVASUVIT, and V. SUWATANAPANKUL, A Design Technique for Transitional Butterworth-Chebyshev Filters, Proc. IEEE, VOL. 67, NO. 6, JUNE 1979.

14) P. THAJCHAYAPONG and F. CHEEVASUVIT, A Maximally Flat Group Delay Recursive Digital Filter with Improved Passband Magnitude Response, Proc. IEEE, VOL. 67, NO. 12, DECEMBER 1979.

15) P. THAJCHAYAPONG, V. SUWATANAPANKUL, and F. CHEEVASUVIT, An Equiripple Bandpass Recursive Digital Filter with Adjustable Skirt Selectivities, Proc. IEEE, VOL. 68, NO. 2, FEBRUARY 1980.

16) P. THAJCHAYAPONG, V. SUWATANAPANKUL, and F. CHEEVASUVIT, An Equiripple Bandpass Recursive Digital Filter with Adjustable Skirt Selectivities, Proc. IEEE, VOL. 68, NO. 2, FEBRUARY 1980.

17) P. THAJCHAYAPONG, V. SUWATANAPANKUL, and F. CHEEVASUVIT, Transitional MURROMAF-MURROER Filters with Addition Members, Proc. IEEE, VOL. 68, NO. 3, MARCH 1980.

18) P. THAJCHAYAPONG, M. PUANGPOOL, S. BANJONGJIT, MAXIMALLY FLAT F.I.R. FILTER WITH PRESCRIBED CUTOFF FREQUENCY, 19th June 1980, Proc. IEEE, VOL. 16, NO. 13, pp. 514-515.

19) P. THAJCHAYAPONG, F. CHEEVASUVIT, SINE-COSINE SQUARED-MAGNITUDE FUNCTION FOR MAXIMALLY FLAT DIGITAL BANDPASS FILTERS WITH ADJUSTABLE SKIRT SELECTIVITIES, Proc. IEEE, 7th June 1979, VOL. 15, NO. 12, pp. 345-346.

20) P. THAJCHAYAPONG, F. CHEEVASUVIT, S. MANAPEE, TRANSITIONAL BUTTERWORTH-CHEBYSHEV FILTERS, Proc. IEEE, 28th September 1978 VOL. 14, NO. 20, pp. 680-681.

21) C. KIMPAN, "Recognition of Handprinted Characters by-Nonlinear Elastic Matching", Ladkrabang Engineering Journal, 1980, VOL. 3, NO. 1.

22) K. MAITREE, "Computation of Upper and Lower Content", Ladkrabang Engineering Journal, 1980, VOL. 3, NO. 1.

23) C. KIMPAN, "Fail-Safe System", Ladkrabang Engineering Journal 1978, VOL. 1, NO. 1.

24) K. MAITREE, "The Use of Topological Properties in Character Recognition", Ladkrabang Engineering Journal 1978, VOL. 1, NO. 1.

25) K. MAITREE, "Elimination of Redundancy", Proc. IEEE, VOL. 67, NO. 8, 1978.

Papers presented at the 4th National Conference of Electrical Engineering, Bangkok, 1981.

26) C. KIMPAN, P. ASAWAWIMAL, "Fail Safe in Microprocessor based Traffic Light Controller", Presented at 4th Electrical Engineering Department of 8-University Conf. August 1981, Ladkrabang Bangkok Thailand.

27) J. AIMCHALAM, T. SURARATTANARANGSRI, "8080 cross Assembler".

28) K. MEKABANCHAKIT, W. RUJIRAPRAPA, P. THAJCHAYAPONG, "KMIT/RERIS I Student Registration Package".

29) M. CHINAKARN, P. MANASMONGKOL, P. ASAWAWIMOL, P. THAJCHAYAPONG, "KMIT/Super Kit Z-80 Single board Computer".

30) V. SUPPARATTANADOM, S. CHAIYAPON, P. THAJCHAYAPONG, K. PETCHSUWAN, "LANDSAT Image Processing of Chumporn Campus.

31) S. BANJONGCHIT, P. THAJCHAYAPONG, "IIR filter with adjustable Selectivity".

32) M. PUNGPOON, P. THAJCHAYAPONG, "FIR filter design with Specific cut-off".

Published Papers on Solid State Technology

1. S. Supadech, P. Vacharapibul, "Control of Threshold Voltage ib Si MOS-p^+- i - n^+ Diode by Gate Biased". Proceedings of 1st Electrical and Electronic Conference, Bangkok 1978.

2. S. Supadech, I. Arunsrisangchai, "Transistor Design and Fabrication at Landkrabang" Proceedings of 1st Electronic Conference, Bangkok 1978.

3. S. Supadech, "The Characteristics of the p^+- i - n^+ Diodes with a narrow i - region". Proceedings of 1st Electrical and Electronic Conference Bangkok 1978.

4. S. Supadech, "Negative Resistance Phenomena of Si p^+- i - n^+ Diodes" Ladkrabang Engineering Journal Vol. 1 No. 1 June, 1978.

5. S. Supadech, "Measurement of Series Resistance of p - n Junction Diode" Ladkrabang Engineering Journal Vol. 2 No. 1 March, 1979.

6. S. Supadech, I. Arunsrisangchai, "Switching Phenomena in Reversed Biased Gold Diffused Si p^+- i - n^+ Diode" Proceedings of Institute of Electronics and Electrical Engineers, Vol. 67, No. 3, 1979.

7. S. Supadech, P. Vacharapibul, "Transfer of on state between closed space Negative Resistance." Solid State and Electron Devices (SSED) IEE, January, 1980.

8. S. Supadech, M. Sangworasil, I. Arunsrisangchai, S. Wongmetta, "Research, Design, Fabrication and Development of Si Solar Cells" Proceeding of 4th Electrical and Electronic Conference Bangkok, 1981.

9. S. Supadech, S. Wongmetta, "Effect of Temperature on Silicon Solar Cells Performance" Proceeding of 4th Electrical and Electronic Conference Bangkok, 1981.

10. S. Supadech, W. Titiroongruang, "Controlling the Breakdown in Silicon p - p Junction" Proceeding of 4th Electrical and Electronic Conference Bangkok, 1981.

11. K. Sato, "Silicon Photo Diode" Proceeding of 4th Electrical and Electronic Conference Bangkok, 1981.

Published Papers on Electrical Engineering
In the Proceedings of 3rd National Conference of Electrical Engineering, Bangkok, 1980

1. Suboptimum Load Frequency Control by C. Pooripanyawanich[+]

2. Arc Discharge in Air by N. Sukhum[+], N. Nualnom, S. Leartsupakul, and A. Rantanakarn.

3. Light Distribution Measurement Equipment, by W. Wuthiwatana, S. Guyai, A. Ploysawan, C. Sae-Yao.

4. The Single Travelling Wave Linear Induction Machine - An Introduction by B. Varasundharosoth[+].

5. The Single Phase Travelling Wave Linear Induction Machine - Design Criteria by B. Varasundharosoth[+].

6. Variable - Speed Single-phase Induction Motor Using Capacitors — by K. Masratana[+]

7. Linknet- A Structure for Computer Representation of Network — by S. Prapai[+o], C. Pooripanyawai

8. Characteristics of Annular Linear Induction Pump — by Prof. T. Utsumi[*]

9. A Voltage and Motor Protector — by R. Pukdurong[o], P. Petchjatuporn[o], S. Pookaiudom, B. Varasundharosoth[+]

10. A Controller for Power Factor System's Correction — by N. Amornkul[o], P. Petchjatuporn[o], B. Varasundharosoth[+], S. Pookaiudom

11. Variable Speed Linear Induction Motor — by B. Varasundharosoth[+]

12.	An Induction Generator System for Wind Turbine	by B. Varasundharosoth[+] T. Atasaet[+] N. Amornkul[o] P. Prisuwanna[+ o]
13.	Faraday's Disc Motor-A Prototype	by B. Varasundharosoth[+] P. Prisuwanna[+ o]
14.	Experimental Characteristics of a Self-Excited Brushless Single-phase Alternator	by P. Prisuwanna[+ o] M. Srisom-on P. Srisurangkul B. Varasundharosoth
15.	Line Voltage Regulator	by P. Prisuwanna[+ o] B. Varasundharosoth[+]
16.	Self Oscillating Linear Induction Motors	by M. Saelee[+ o] P. Viriyawatana B. Varasundharosoth[+]
17.	Glow Discharge	by N. Sukhum[+]
18.	Streamer Propagation in Compressed Gases	by S. Tieammuang[+]

+ Staff of Electrical Engineering Department

o Postgraduate Student

* JICA Expert to the Department

Undergraduate Student

(Table 3)

A-1-4 Estimation of Number of Graduates from Faculty of Engineering, KMIT LADKRABANG

(Academic Year)

Dept.	1978	1979	1980	1981	1982	1983	1984	1985
Telecommunication E	30	30	30	30	30	30	30	45
Electronics E	30	30	30	30	30	30	30	45
Electrical E	30	30	30	30	30	30	30	45
Computer & Control E	30	30	30	45	60	60	60	80
Mechanical E.	-	-	10	15	15	15	15	15
Industrial Tech.	20	30	30	30	50	50	50	50
Post Graduate Course	3	4	5	8	10	15	15	15
Total	143	154	165	188	225	230	230	275

(Table 4)

A-2 The Counterpart Staff

A-2-1 List of the Counterpart Staff

Data Processing Technology

Name and Sur-name	Age	Final academic career (year)	Speciality	Date of Assign-ment to KMIT	History of Study Abroad (Period of CP)	Remarks
1. Dr. Kosol Petchsuwan	42	Ph. D. (1967)	Automatic Control	1967	10 (England)	Dean of Faculty of Eng.
2. Dr. Pairash Thajchayapong	37	Ph. D. (1975)	Digital Signal Processing	1975	10 (England)	Associate & Director of Computer Center
3. Mr. Chom Kimpan	37	MS. EE. (1975)	Computer Memory	1975	3 years (Japan)	Acting Head of Dept. of Computer
4. Mr. Pratheep Bunyatnoparat	33	M. Eng. (1977)	Automata	1977	$3\frac{1}{2}$ years (Japan)	
5. Mr. Kanchit Maitree	30	M. Eng. (1978)	Pattern Recognition	1978	3 years (Japan)	Studying Ph.D. at Hiroshima Univ.
6. Mr. Boonwat Atachoo	26	B. Eng. (1979)	Microprocessor	1979	-	-
7. Mr. Paisan Lomthong	27	M. Eng. (1980)	Computer Network	1981	3 years (Japan)	Studying Ph.D. at Tohoku Univ.
8. Mr. Wuthichai Rujiraprapa	23	B. Eng. (1981)	Computer Programming	1981	-	-
9. Miss Kittima Mekabanchakit	23	B. Eng. (1981)	Computer Programming	1981	-	-
10. Mr. Anusak Jinapan	23	B. Eng. (1981)	Digital Logic Design	1981	-	-
11. Mr. Manoon Chinakarn	23	B. Eng. (1981)	Microprocessor	1981	-	-

Data Processing Technology

Name and Sur-name	Age	Final academic career (year)	Speciality	Date of Assign-ment to KMIT	History of Study Abroad (Period of CP)	Remarks
12. Mr. Putaporn Manasmongkol	23	B. Eng. (1981)	Micropro-cessor	1981	-	-
13. Mr. Paisarn Asawawimol	23	B. Eng. (1981)	Micropro-cessor	1981	-	-
14. Mr. Padet Dokechan	23	B. Eng. (1981)	Computer Programming	1981	-	-
15. Miss Duang-porn Sriratana	24	B. Sc. (1981)	Computer Programming	1980	-	-
16. Mr. Ruttikorn Varakulsi-riputh	28	B. Eng. (1978)	Electronics	1978	5 years (Japan)	Studying M. Eng. at Tohoku Univ.
17. Mr. Somchai Wongmetta	22	Dipl. (1981)	Electronics	1978	5 years (Japan)	
18. Mr. Pallop Laochareon	37	M. Eng. (1978)	Control	1974	7 years (Japan)	Studying Ph. D. at Osaka Univ.

Solid State Technology

Name and Sur-name	Age	Final academic career (year)	Speciality	Date of Assign-ment to KMIT	History of Study Abroad (Period of CP)	Remarks
1. Dr. Sithichai Pookaiyaudom	32	Ph. D. (1976)	Electronics	1976	7 years (Aust.)	Associate Dean & Head of Dept. Electro-nics
2. Mr. Somkiat Supadech	31	M. Eng. (1977)	Solid State Electronics	1977	3 years (Japan)	Head of Electronics Research Center
3. Mr. Manas Sangworasit	30	M. Eng. (1977)	Bio-Medical Eng.	1977	3 years (Japan)	-
4. Mr. Itthichai Arunsri-sangchai	25	B. Eng. (1979)	Solid State Electronics	1977	-	-
5. Mr. Somchai Wongmetta	22	B. Eng. (1979)	Solid State Electronics	1979	-	-
6. Mr. Wisut Titiroongruang	22	B. Eng. (1980)	"	1980	-	-
7. Mr. Somsak Atcharee-worakul	26	B. Eng. (1977)	"	1980	-	-
8. Mr. Somsak Chaisirikul	24	B. Sc. (1974)	Solid State Physics	1979	-	-
9. Miss Jindarat Suppatvech	23	B. Sc. (1980)	Chemistry	1980	-	-

Electrical Engineering

Name and Sur-name	Age	Final academic career (year)	Speciality	Date of Assign-ment to KMIT	History of Study Abroad (Period of CP)	Remarks
1. Dr. Birasak Varasund-harosoth	33	Ph. D. (1979)	Electrical Machine, Energy Conversion	1975	1969-1973 (N.S.W. Aust.) 1977-1979 (Cant. N.Z.)	Head of Department, Assistant Professor
2. Somchet Thiemmuang	32	M. Eng. (1977)	High Voltage Technology, Power System	1977	1974-1977 (Tokai, Japan)	Head of High Voltage and Power System Section
3. Viriya Pichetcham-rean	32	M. Eng. (1978)	Power	1978	1975-1978 (Tokai, Japan)	Head of Electrical Machines and Power Electro-nic Section
4. Teerasilp Tumawipart	28	B. Eng. (1978)	Power Systems & Power Electronics	1978	-	Head of Equip-ment Mainte-nances and Installations Section
5. Dr. Nipon Sukhum	43	Ph. D. (1965)	High Voltage Technology	1965	1958-1964 (England)	Assistant Professor
6. Nithad Krisnachinda	35	Advanced Profes-sional Degree in E. E. (1975)	Power - System	1971	1971-1974 (U.S.A.)	On Study Leave (1980-1981)
7. Chamnarn Pooripanya-wanich	27	M. E. (1980)	Power System	1978	1974-1978 1979-1980 (Cant. N.Z.)	-
8. Sulee Banjongjit	29	M. Eng. (1981)	Electrical Machine	1977	-	-
9. Kovit Masratana	26	M. Eng. (1981)	Electrical Machine	1981	-	-

Electrical Engineering

Name and Sur-name	Age	Final academic career (year)	Speciality	Date of Assign-ment to KMIT	History of Study Abroad (Period of CP)	Remarks
10. Thongbai Ataset	31	B. Eng. (1976)	Solar Energy Illumina-tion	1976	-	-
11. Wandee Wuthiwatana	32	B. Eng. (1975)	Illumina-tion	1973	1979 (Japan)	-
12. Veerasak Vongwiwat	29	B. Eng. (1978)	Energy Conversion	1980	-	-
13. Prapass Prisuwanna	25	B. Eng. (1981)	Energy Conversion & Electri-cal Machine	1981	-	-
14. Sompoch Prapai	24	B. Eng. (1981)	Power System	1981	-	-
15. Monton Sae-Lee	24	B. Eng. (1981)	High Voltage Technology	1981	-	-

(Table 5)

A-2-2 Research and educational activities of each member of the counterpart staff.
Data Processing Technology

Dr. Kosol Petchsuwan

	Duration	Title of Lecture	Hour/ week	Experiment	Hour/ week	Research Theme	Presentation of Papers
Past (since 1978)	1978 - 80	Control Theory	3	-	-	Computer Applications	3
	1978 - 80	Operations Research	3	-	-		
	1978 - 80	Mathematical Analysis	3	-	-		
Present	1981	Control Theory	3	-	-	Computer Applications	4
	1981	Operations Research	3	-	-		
	1981	Mathematical Analysis	3	-	-		
Future		Control Theory	3	-	-	Computer Application	
		Operations Research	3	-	-		
		Math. Analysis	3	-	-		

Dr. Pairash Thajchayapong

Duration		Title of Lecture	Hour/ week	Experiment	Hour/ week	Research Theme	Presentation of Papers
Past (since 1978)	1978, 1979	Electric Circuit I	3	-	-		
	1978, 1979	Discreti Signal Processing I	3	-	-		
	1978, 1979	Project	9	-	-	Discreti	
	1978, 1979	Master Thesis	9	-	-	Signal Processing	
Present	1980, 1981	Digital Image	3	-	-		
		Processing Discreti Signal Processing I,II	3	-	-		
		Data Management	3	-	-		
		Master Thesis	9	-	-	Disital Filters	
		Project	9	-	-	Image Processing	
Future	1982, -	Electronic Circuits I	3	-	-		
		Discreti Signal Processing I,II	3				
		Master Thesis	9	-	-	Data Processing Digital Filters	
		Project	9	-	-	Image Processing	

Mr. Chom Kimpan

Duration		Title of Lecture	hour/ week	Experiment	hour/ week	Research Theme	Presentation of Papers
Past (since 1978)	1978-1979	Computer System	3	Laboratory I	6	Digital TTL Traffic light controller	1
		Numerical Computation and Programming	3	Programing lab.	4		
				Graduation Project	9		
	1979-1980	Computer System	3			Microprocessor based-	
		Numerical Computation and Programming	3	Same as above		Traffic light controller	1
		FORTRAN Programming	1				
Present	1980-1981	Computer System	3				
		Numerical computation and Programming	3	Same as above		Thai character pattern Recognition	1
		Computer Programming	3				
		FORTRAN Programming	1				
Future	1981-1982	Same as above		Same as above		Thai character pattern Recongnition Computer Network	

Mr. Pratheep Bunyatnoparat

Duration		Title of Lecture	hour/ week	Experiment	hour/ week	Research Theme	Presentation of Papers
Past (since 1978)	1975-1980	Digital Logic Design	6	Digital Laboratory	6	-Traffic Light control	1
	1978-1980	Switching Theory	3			-Assembler Language (1979)	
	1979	Microprecessor	3				
	1978-1980	Computer Engineering	3			-Vending Machine (1980)	
Present		Digital Logic Design	3	Digital Laboratory	6	-Application of Computer in Education	
		Assembler languages	3			-CAD of Logic Circuit	
		Computer Engineering	3				
		Microprocessor in Instrumentation	3				
		Introduction to Computer	3				
		Switching Theory	3				
Future		Same as above					

Mr. Kanchit Maitree

Duration		Title of Lecture	hour/ week	Experiment	hour/ week	Research Theme	Presentation of Papers
Past (since 1978)	1978-1979	Numerical Computation and Programming	3	Laboratory	6		
				Programming Languages (lab.)	4	Pattern Recognition	1
		Programming language	3				
		Information Theory	3	Graduation Project	9		
		Pattern Recognition	3				
		Learning Machine	3				
	1979-1980	Same as above		Same as above		Pattern Recognition	1
Present	1980-1981	Studying in Japan (PH.D.)					
Future							

Mr. Boonwat Attachoo

Duration		Title of Lecture	hour/ week	Experiment	hour/ week	Research Theme	Presentation of Papers
Past (since 1978)	1978-1979	Microprocessor	3	Laboratory	6	Digital TTL	
				Programming Languages (lab)	4	Traffic light Controller	
				Graduation Project	9		
	1979-1980	-		Same as above		Microprocessor based-traffic light controller Microprocessor application	
Present	1980-1981	Digital Logic Design	3	Laboratory	6	Microprocessor application	
				Programming Languages (lab.)	4	Digital IC-Tester	
		Microprocessor	3	Graduation Project	9	Modifier-N6300 M50 (Software)	
Future	1981-1982	Same as 1980 - 1981		Same as above		Microprocessor application Computer Network	

Mr. Paisan Lomtong

Duration		Title of Lecture	hour/ week	Experiment	hour/ week	Research Theme	Presentation of Papers
Past(since 1978)							
Present						KMIT Computer Network Planing and Developing	
Future		Computer Network Architecture and Protocol	3			Inter University Computer Network	

Mr. Wuttichai Rujirabrapa

Duration		Title of Lecture	hour/ week	Experiment	hour/ week	Research Theme	Presentation of Papers
Past (since 1978)							
Present	1980-1981	-COBOL Programming -FORTRAN Programming	1 1	Data.-Entry Data-Entry	1 1	-NEC/300 Development -RPG Education -Registration packages	Registration packages
Future	1981-1982	-RPG Programming -Cataloged -System Management					

Miss. Kittima Mekhabunchakij

Duration		Title of Lecture	hour/ week	Experiment	hour/ week	Research Theme	Presentation Papers
Past (since 1978)							
Present		COBOL Programming FORTRAN Programming	2 2	Data-Entry Data-Entry	2 2	-NEC/300 Development -HPL & PL/I Education -Registration of student packages	-Student Record processing packages
Future		-PL/I Programming -HPL Programming -NEC/300 Development -Using the packages					

Mr. Anusakdi Jinaphant

Duration		Title of Lecture	hour/ week	Experiment	hour/ week	Research Theme	Presentation of Papers
Past (since 1978)							
Present	1981-1982	Numerical Computation and Programming	2	FORTRAN	8	Multipragramming	
				COBOL programming	4	Bio-slice Microprocessor	
		Introduction to FORTRAN programming	2				
		Digital logic design	3	Electronic Lab.	18	Modified Data Entry	
		Introduction to COBOL programming	1				
Future	1982-1983	Microprocessor	3			Operating Systems	
		Multi Micro-programming	3			I/O channel	
		Operating Systems	3				

Mr. Manoon Chinakarn

	Duration	Title of Lecture	hour/ week	Experiment	hour/ week	Research Theme	Presentation of Papers
Past (since 1978)							
Present	1980-1981	Engineering Laboratory II (4th Years)	6				
		Project	9			Microprocessors	
Future	1982	Engineering Lab. II	6				
		Project	9			Microprocessors	

Mr. Padet Dorkjun

	Duration	Title of Lecture	hour/ week	Experiment	hour/ week	Research Theme	Presentation of Papers
Past (since 1978)							
Present	1981-1982	-Programming Language	3	COBOL programming	3	Thai character Recognition	
		-Introduction to FORTRAN programming	2	FORTRAN programming	3		
				Electronic lab.	18		
Future	1982-1983	Micro-processor Data-	3			Data-Base Compilers	
		Data-base	3				

Miss. Duangporn Sriwatana

	Duration	Title of Lecture	hour/ week	Experiment	hour/ week	Research Theme	Presentation of Papers
Past (since 1978)							
Present	1980-1981	-COBOL Programming	1	-Data-Entry	1		
		-FORTRAN Programming	1	-Data-Entry	1		
Future	1981-1982	Same as above					

Mr. Somchai Deemak

Duration		Title of Lecture	hour/ week	Experiment	hour/ week	Research Theme	Presentation of Papers
Past (since 1978)							
Present		-Operation	-	Data-Entry	1		
Future							

Solid State Technology

Mr. Somkiat Supadach

Duration		Title of Lecture	hour/ week	Experiment	hour/ week	Research Theme	Presentation of Papers
Past (since 1978)		Semiconductor Theory	2	Semiconductor Measurement	6	"Switching Phenomena in Reversed Biased Gold Diffused Si P"	1
		Semiconductor Devices I	3				
		Semiconductor Devices II	3	Experimentation and Seminar I	9	"Transfer of on state between closed space N R p^+ i - n^+ Diodes"	1
		MOS Devices	3	Experimentation and Seminar II	3		
		Basic Semiconductor Devices	3				
		IC Design Fabrication	3				
Present		Semiconductor Theory	3	Semiconductor Measurement	6	"Research, Design Fabrication and Development of Si Solar Cells"	2
		Semiconductor Devices I	3	Graduate Project	9		
		Semiconductor Devices II	3	Experimentation and seminar I	3	"Bipolar Transistor Design Fabrication"	1
		MOS Devices	3	Experimentation and seminar II	3		
		Basic Semiconductor Devices	3			"Breakdown Phenomena in Si p - n junction"	1
		IC Design Fabrication	3				
Future		Semiconductor Theory	3	Semiconductor Measurement	6	Unipellar Transistor Design Fabrication"	
		Semiconductor Devices I	3	Graduate seminar	9		
		Semiconductor Devices II	3				
		MOS Devices	3	Experimentation and seminar I	3	Digital IC Design Fabrication	
		Basic Semiconductor Devices	3				

Mr. Manas Sangworasil

Duration		Title of Lecture	hour/ week	Experiment	hour/ week	Research Theme	Presentation of Papers
Past (since 1978)		Bio-Electronic	3	Electronic Lab.	6	"Cell Communication"	1
		Electronic-Circuit	3	Graduate Project	9	Differential Transfermer for blood flows measurement	1
		Pulse Engineering	3	Experimentations and Seminar I	3		
		MOS IC Design	3				
		Digital Engineering	3	Experimentations and Seminar II	3	"Ultra-sound for Respirator"	1
Present	1981	Bio-Electronic	3	Electronic Lab.	6	"Ultrasound Stethoscope"	1
		Electronic Circuit	3	Graduate	9	"Constant current for bone healing"	1
		Pulse Engineering	3	Experimentation and Seminar I	3		
		MOS IC Design	3				
		Degital Engineering	3	Experimentation and Seminar II	3	"Semiconductor Sensor Devices"	-
Future		Same as above		Same as above		"Semiconductor Senor Devices"	
				Master thesis	3	"Digital IC Design & Fabrication	

Mr. Ittichai Arunsrisangchai

Duration		Title of Lecture	hour/ week	Experiment	hour/ week	Research Theme	Presentation of Papers
Past (since 1978)				Electronic Lab. I Semiconductor Measurement Graduate Project Electronic Lab. II	6 6 9 6	"Switching Phenomena in Reversed Biased Fold Diffused Si p^+-i-n^+ Diodes" "Bipolar Transistor Design & Fabrication"	1
Present				Electronic Lab. I Electronic Lab. II Graduate Project Semiconductor Measurement	6 6 9 6	"Si Solar Cells Design & Fabrication" "Bipolar Transistor Design & Fabrication"	1
Future		Semiconductor theory Semiconductor Devices I Semiconductor Devices II	3 3 3	Electronic Lab. I Electronic Lab. II Graduate Project Semiconductor Measurement Experimentation and Seminar I " II	6 6 9 6 3 3	"Digital IC: Design & Fabrication" "Bipolar, Transistor Design & Fabrication"	

Mr. Somchai Wongmetta

Duration		Title of Lecture	hour/ week	Experiment	hour/ week	Research Theme	Presentation of Papers
Past (since 1978)				Electronic Lab I	6	"Si Solar Cells Design & Fabrication"	
				Electronic Lab II	6		
				Graduate Project	9		
				Semiconductor Measurement	6		
Present				Electronic Lab I	6	"Si Solar Cells Design & Fabrication"	
				Electronic Lab II	6		
				Graduate Project	9	"MOS FET"	
				Semiconductor Measurement	6		
Future		Semiconductor Theory	3	Electronic Lab I	6	"Si Solar Cells Design & Fabrication"	
		Semiconductor Devices I	3	Electronic Lab II	6		
		Semiconductor Devices II	3	Graduate Project	9	"Digital IC" Design Fabrication"	
				Semiconductor Measurement	6		
				Experimentation & Seminar I	3		
				" II	3		

Mr. Wisut Titivoongruang

Duration		Title of Lecture	hour/ week	Experiment	hour/ week	Research Theme	Presentation of Papers
Past (since 1978)		-		-		-	-
Present				Electronic Lab. I	6	"Breakdown-Phenomena in Si p.n junction"	1
				Electronic Lab. II	6		
				Graduate Project	9	"Si Solar Cells"	1
				Semiconductor Measurement	6		
Future		Semiconductor Theory	3	Electronic Lab. I	6	"Digital IC	
		Semiconductor Devices I	3	Electronic Lab. II	6		
		Semiconductor Devices II	3	Semiconductor Measurement	6	Design & Fabrication" "MOSFET"	
				Graduate Project	9		

Mr. Somsak Cheairsirikul

Duration		Title of Lecture	hour/ week	Experiment	hour/ week	Research Theme	Presentation of Papers
Past (since 1978)		-		-			-
Present				Electronic Lab. I Electronic Lab. II Semiconductor Measurement Graduate Project	6 6 6 9	"Breakdown Phenomena in Si p.n junction" "Si Solar Cells" "Bipolar Transistor"	1 1
Future		"Physic Semiconductor" "Quantum Electronic"	3 3	Electronic Lab. I Electronic Lab. II Semiconductor Measurement Graduate Project	6 6 6 9	"Digital IC" "MOS IC"	

Mr. Somsak Audchrevorakul

Duration		Title of Lecture	hour/ week	Experiment	hour/ week	Research Theme	Presentation of Papers
Past (since 1978)							
Present	(TUE) 10:50-12:30 13:30-15:10	Electrical Engineering (2nd. Year.)	4	Electronics Circuits	20	Electronic Instrumentation	
Future							

Electrical Engineering

Dr. Birasak Varasundharosoth

	Duration	Title of Lecture	hour/ week	Experiment	hour/ week	Research Theme	Presentation of Papers
Past (since 1978)	2nd Semester 1978	Electrical Machine II Electrical Engineering II	6 1	Projects Supervision,	9	Research and Development in Electrical Machine and related fields	5 papers published included 3 intention
	1980	Electrical Machine I Electrical Machine II Electrical Engineering II Generalized theory of Electrical Machine	6 6 4 3	Projects Supervision both Postgraduate and Under graduate	15	Same as above supervise 1 master Student of Chulalongkorn University	3 papers published in Electrical Machine field
Present	1st Semester	Induction Machine Selected Topics in Electrical Machine (master)	3 3	Projects Supervisor both Undergraduate & Postgraduate No. of Projects=13	21	Research & Development in Electrical Machine Energy Conversion & Others	9 papers to be present in the 4th National Conference in Electrical Engineering
Future	Generalized	Generalized Theory of Electrical Machine Induction Machines Design of Electrical Machines Unified Theory of Electromagnetic Machines(Master) Selected Topics in Electrical Machines(Master) Linear Machines (Master)(about 2 Subjects per Semester)	3 3 3 3 3 3	Projects Supervisor both Undergraduate Postgraduate	12	Continue Research in the Same field	about 5-10 papers per years Average

Mr. Somchet Thiemmuang

	Duration	Title of Lecture	hour/week	Experiment	hour/week	Research Theme	Presentation of Papers
Past (since 1978)	First Semester 1978	High Voltage Technology	3	Laboratory and Project Supervision	18	Analysis of Discharge and Breakdown Mechanism in Air	
		Power System I	3				
	Second Semester 1978	Power System II	3	Laboratory and Project Supervision	18		
		Electrical Engineering II	3				
	First Semester 1979	High Voltage Technology	3	Laboratory and Project Supervision	18		
	Second Semester 1979	Energy Conversion and Environmental	3	Laboratory and Project Supervision	18		
		Electrical Engineering II	3				
	First Semester 1980	High Voltage Technology	3	Laboratory and Project Supervision	18	Streamer Propagation in Compressed Gases	
	Second Semester 1980	Theory of Dielectric Phenomena	3	Laboratory and Project Supervision	18		
Present	First Semester 1981	High Voltage Technology	3	Laboratory and Project Supervision	18		
	Second Semester 1981	Theory of Dielectric Phenomena	3	Laboratory and Project Supervision	18		
		Electrical Mechine(for Industrial Technology Students)	3				
Future		High Voltage Technology	3	Laboratory Project and Post-Graduate Student Supervision		Corona Phenomena	
		Theory of Dielectric Phenomena	3				
		Energy Conversion Technology	3				

Mr. Viriya Pichetjamroen

	Duration	Title of Lecture	hour/ week	Experiment	hour/ week	Research Theme	Presentation of Papers
Past (since 1978)	2nd Semester 1978	Power Electronics	3	Laboratory and Project Supervision	15		
	1st Semester 1979	Power Electronics	6	Laboratory and Project Supervision	18	Linear Electrical M/C (T F M)	
	2nd Semester 1979	Introduction to Linear Electrical M/C	3	Laboratory and Project Supervision	18	"	
	1st Semester 1980	Power Electronics	6	Laboratory and Project Supervision	18	Static Frequency Converter	
	2nd Semester	Introduction to Linear Electrical M/C	3	Laboratory and Project Supervision	18	"	
Present	1980 1st Semester 1981	Electrical M/C Electro-mechanical Energy Conversion	3	Laboratory and Project Supervision	18	Cycloconverter Static Frequency Converter	
			3	"	18		
	2nd Semester 1981	-	-	-	-	-	
Future							

Mr. Tecresilp Tumawipart

Duration		Title of Lecture	hour/ week	Experiment	hour/ week	Research Theme	Presentation of Papers
Past (since 1978)	1st 1978	-		Laboratory and project Supervision	21		
	2nd 1978	Electrical Engineering II					
	1st 1979	Engineering Workshop	2	Laboratory and project Supervision	21		
	2nd 1979	Electrical Engineer	4				
	1st 1980	Engineering Workshop	2	Laboratory and project Supervision			
	2nd 1980	Power System II	3				
Present	1st 1981	Engineering Workshop	2	Laboratory and project Supervision	12		
	2nd 1981	-					
Future		Power System	3	Laboratory and Project Supervision	12		
		Lighting and Electrical System Design	3				

Dr. Nipon Sukum

Duration		Title of Lecture	hour/ week	Experiment	hour/ week	Research Theme	Presentation of Papers
Past (since 1978)	1st Semester 1978			Lab. 4th Yr.	6		
	2nd Semester 1978			Lab. 4th Yr.	6		
	1st Semester 1979	High Voltage Tech.	3	Lab. 4th Yr.	6	Are Discharge in air	
	2nd Semester 1979	High Voltage Tech.	3	Lab. 4th Yr.	6		
	1st Semester 1980	High Voltage Tech.	3	Lab. 4th Yr.	6		
	2nd Semester 1980	High Voltage Tech.	3	Lab. 4th Yr.	6		
Present	1st Semester 1981	High Voltage Tech.	3	Lab. 4th Yr.	6		
Future						Ionization chamber	

Mr. Nithad Krisnachinda

Duration		Title of Lecture	hour/ week	Experiment	hour/ week	Research Theme	Presentation of Papers
Past (since 1978)		Power System Energy Conversion	3 3	Laboratory Supervision Each Semester Average	15	Energy Conversion	2 paper (KMIT pub)
Present			On study Leave				
Future		Energy Conversion Engineering Management	3 3	Average per Semester	12	As mentioned above	

Mr. Chamnarn Puripanjavanit

Duration		Title of Lecture	hour/ week	Experiment	hour/ week	Research Theme	Presentation of Papers
Past (since 1978)	1st Semester 1978	Power System I	3	Laboratory & Project Supervision	18	Induction Generator	
	2nd Semester 1978	Power System II	3	"	18	Induction Generator	
		Lighting Design	3				
	1st Semester 1980	Power System I	3	Laboratory & Project Supervision	15	Power System Load Flow	Load Frequency
	2nd Semester 1980	Power System II	3	"	15	Power System Load Flow	Design for Two power Area
		Lighting Design	3				
Present	1st Semester 1981	-	-	Project Supervision (Under - graduate)	9	Economic Despatch	Linknet Structure
				Project Supervision (Master Thesis)	9	Automatic Generation Control	
Future							

Mr. Sulee Banjongjit

Duration		Title of Lecture	hour/ week	Experiment	hour/ week	Research Theme	Presentation of Papers
Past (since 1978)	1st 1978	Electrical Machines I	3	Laboratory and Project Supervision	18		
	2nd 1978	Electrical Machines II	3				
	1st 1979	Electrical Machines I	3	Laboratory and Project Supervision	18		
	2nd 1979	Electrical Machines II	3				
	1st 1980	-	3	Laboratory and Project Supervision	18		
	2nd 1980	Electrical Machines (for Industrial Tech. Student)					
Present	1st 1981	Electrical Machines I	3	Laboratory and Project Supervision	18		
	2nd 1981	Electrical Machines II	3				
		Electrical Machines (For Industrial Tech. Student)	3				
Future		Electrical Machines I	3	Laboratory and Project Supervision	18		
		Electrical Machines II	3				

Mr. Kovit Masratana

Duration		Title of Lecture	hour/ week	Experiment	hour/ week	Research Theme	Presentation of Papers
Past (since 1978)							
Present	1st Semester 1981	-	-	Laboratory Supervision	18	Electrical Machines	1 paper
Future		Induction Machines	3	Laboratory Supervision Each Semester	15	Student's Project Supervision	about 1 paper per year

Mr. Thongbai Ataset

Duration		Title of Lecture	hour/ week	Experiment	hour/ week	Research Theme	Presentation of Papers
Past (since 1978)	2nd Semester	Lighting & Electrical System Design Electrical Engineering II	3 2	Average for Each Semester	15	Energy Conversion Wind, Solar, Student's Project Supervision	
Present	1st Semester 1981	Electrical Estimation & Design	3	-	-	Same as above	1 paper in wind generation System
Future		Solar Energy Electrical Estimation & Design	3 3			Same as above	about 1-2 paper per year

Miss Wandee Wuttiwattana

	Duration	Title of Lecture	hour/ week	Experiment	hour/ week	Research Theme	Presentation of Papers
Past (since 1978)	1st 1978	-		Laboratory & Project Supervision	18		
	2nd 1978	Lighting & Electrical System Design	3				
	1st 1979	-		Laboratory & Project Supervision	18		
	2nd 1979	Lighting & Electrical System Design	3				
	1st 1980	-		Laboratory & Project Supervision	18		
	2nd 1980	Lighting & Electrical System Design	3				
Present	1st 1981	-		Laboratory & Project Supervision	18		
	2nd 1981	Lighting & Electrical System Design	3				
Future		Lighting & Electrical System Design	3	Laboratory & Project Supervision	18		

Mr. Veerasak Vongviwat

Duration		Title of Lecture	hour/ week	Experiment	hour/ week	Research Theme	Presentation of Papers
Past (since 1978)	2nd 1980 Semester	Basic Electrical Engineering Electrical Engineering II	2 2	Average for Each Semester of Laboratory Supervision	15	Electrical Machine, Student's Supervision	
Present	1st 1981 Semester	-	-	Laboratory Supervision	12	Continue Research in the same field of the above	
Future		Electrical Engineering II	4	Laboratory Supervision (average per semester)	15	Same as above	about 1 paper per year

Mr. Prapart Prisuwanna

	Duration	Title of Lecture	hour/ week	Experiment	hour/ week	Research Theme	Presentation of Papers
Past (since 1978)							
Present	1st Semester 1981	-	-	Laboratory Supervision	6	Electrical Machines Energy Conversion Devices Development Rocket propulsion Student's Project Supervision Wind Power System	4 papers
Future		Generalized Theory of Electrical Machine	3	Laboratory Supervision	10	Continue Research in the same fields mentioned above	about 4 paper per year

Mr. Sompoch Prapai

Duration		Title of Lecture	hour/ week	Experiment	hour/ week	Research Theme	Presentation of Papers
Past (since 1978)							
Present	1st Semester 1981	Power Systems I	6	Laboratory Supervision	10	Power System Modeling	1 paper
Future		Power Systems II	3	Laboratory Supervision		Continue Research in the same field of the above mentioned	about 1 paper per year

Mr. Montone Sae-lee

Duration		Title of Lecture	hour/ week	Experiment	hour/ week	Research Theme	Presentation of Papers
Past (since 1978)							
Present	1st Semester 1981	-	-	Laboratory Supervision	20	Linear Oscillating Machine Measuring Instrument Development	1 paper
Future		Energy Conversion	3	Laboratory Supervision	15	High Voltage Technology Student's Project Supervision	

(Table 6)

A - 2 --3 List of the staff who have studied in Japan since 1978

Data Processing Technology

*before RD

	Name and Surname	Place of studying	Period	Theme	Result	Reason selected	Scholarship
1	Mr.Chom Kimpan	Nihon Uni	*3 yr 1974	Computer Memory	MSEE		JICA
2	Mr.Prateep Banyatnoparat	Tokai Uni	*3½ yr 1975	Automata	M.Eng		JICA
3	Mr.Kanchit Maitree	Tokai Uni	*3 yr 1975	Pattern Recognition	M.Eng		JICA
		Hiroshima Uni	DEC 1980	Pattern Recognition	(for Ph.D)		Mombusho
4	Mr.Paisan Lomtong	Uni of Electro - Communication	1978-1981	Computer Network	M.Eng		Mombusho
5	Mr.Rutti - korn Varakulsiri punth	Tohoku Uni	1980	Computer Network	(for M.Eng)		Mombusho
6	Mr.Pallop Laocharoen	Tokai Uni	3½ yr 1972	Control	M.Eng		JICA
		Osaka Uni	1979	Control System	(for Ph.D.)		Mombusho
7	Mr.Chom Kimpan	NEC Company	6 months	NEC System 300 Maintenance	Hardware Training Certificate		JICA (May-November) 1980
8	Mr.Boonwat Attachoo	NEC Company	6 months	NEC System 300 Maintenance	Hardware Training Certificate		JICA (May-November) 1980
9	Dr.Pairash Thajchayapong	NEC Company	2 months	ACOS - 4 Software	Software Training Certificate		JICA (May-August 1980
10	Mr.Worawut Suwattanapunkul	NEC Company	3 months	ACOS - 4 Software	Software Training Certificate		JICA (July-September) 1980

(Table 6)

Solid State Technology

*before RD

Name and Surname	Place of studying	Period	Theme	Result	Reason selected	Scholarship
Mr.Somkiat Supadech	Tokai Univ	3 yr* 1973	Solid State Electronic	M.Eng	Preparation in Solid State	JICA
Mr.Manas Sangworasil	Tokai Univ	3 yr* 1973	Bio-Medical Engineering	M.Eng	Preparation in Bio-Medical	JICA
Mr.Iitthi-chai Arunsrisang-chai	Sophia Univ	6 months	Solid State Technology	Certificate in Solid State Technology	Preparation for Solid State Staff	JICA 1980-1981 (6 months)

(Table 6)

Electrical Engineering

*before RD

	Name and Surname	Place of studying	Period	Theme	Result	Reason selected	Scholarship
1	Mr.Somchet Thiemmuang	Tokai Uni	3 yr* 1973	Electrical Engineering	M.Eng	Preparation for Electrical Engineering Assistant project	JICA
2	Mr.Hok Sae-jew	Tokai Uni	3 yr* 1974	Electrical Engineering	M.Eng	Preparation for Electrical Engineering Assistant project	JICA
3	Miss.Wandee Wutiwatana	Matsushita Electric Co.,Ltd.	3 months 1979	Illumination	-		
4	Mr.Nithad Krisnachinda	-	3 months 1979	Electrical Power	-		JICA
5	Mr.Somchet Thiemmuang	Tokai Uni	1 months 1980	High Voltage	-	According to KMIT and Tokai University memorandam	Tokai University

A-2-4 Former counterpart staff member leaving the job

(Table 7)

Ex-staff member

Name and Surname	Period and His Post in KMIT	Subject of Study done in Japan (Theme, Period, Training Organization, Aquired Qualification, Year)	Reason of His Retirement and His Present Post
Mr.Worawoot Suwatanaankul	1976 - 1981	ACOS 4 Software Training 3 months, NEC, Training Certificate, July-September 1980	He left for higher payment, System support-engineer of Bangkok Bank Computer Security System.

A-2-5

Table 8 Number of the Counterpart Staff

(As of End of March)

Field / Year	Data Processing Technology	Solid State* Technology	Electrical Engineering	Total
1978	20 * * *	4 (16**)	11	35 (47)
1979	15	6	12	33
1980	17	9	12	36
1981	18	9	15	41
1982	(20)	(12)	(17)	(49)
1983	(25)	(15)	(18)	(58)

Note * Only concerning the solid state technology, not all members of the Dept. of Electronics.

** The total number of staff in the Dept. of Electronics.

*** The total number of staff in the Dept. of Computer and Control Engineering.

A - 3 Comments about the buildings

A-1-3 The delay of the construction of the building for Solid State Technology and Data Processing Technology was because of the following factors:

(1) We received the budget for the construction in the Thai Fiscal Year 1978 (from October 1978 - September 1979) for 15 million Bahts. But after the design of the building, because of high inflation rate in Thailand the price of the construction became 40 million Bahts.

(2) We had to request an extra budget from the Thai Government,

It was granted in December 1979 and the construction was then started.

The construction period is 500 days.

However now (August 17, 1981) the second floor for the solid state laboratory and the computer center is totally completed and ready for installation.

A-3-2 The humidity for the new computer room is designed at 50 ± 5%.

A-3-3 (1) The 600 KV DC high voltage generator is now operating at maximum 500 KV because of the limitation of the size of the existing building. The construction of a building of size 26m x 24m x 17m for high tension technology will be started in October 1981 and completed in May 1982 with a budget of 2 million Bahts. The size of the new building will be big enough to accommodate both 600 KV and 1500 KV generators within the safety requirements. The layout of the new building is as attached.

A-3-4 In the new solid state and computer building, the 3Ø 200 volts and 1Ø 100 V power systems are available.

A-3-5 The space for air conditioning units in the solid state laboratory is available.

A-3-6 The layout of the solid state laboratory for new equipment is as attached.

A-4 Operation and Maintenance

A-4-1 (i) Computer maintenance is done by KMIT staff members and DATAMAT engineers.

(ii) KMIT staff do the preventive maintenance.

(iii) Between 14 Sept. 1980 - 13 August 1981, DATAMAT engineer repaired 3 times with the total expenses ₱ 10,000.

Maintenance contract is included.

A-4-2 Problems of the Computer System

Table 9 Trouble Record of Computer

Date	Trouble	Treatment for Recovery	Location of Defect	Replaced Parts
7-17 SEPT 1980	Supply Sequence Error. CRT and SP	Turn on AC switch of floppy disk drive NO. Ø3, Ø4	-	-
18 SEPT 1980 9.00a.m	CP Error System Check	Replace packages	CPU	ECM 73 ECM 74
18 SEPT 1980 1.00p.m	System Crash	Load ACOS-4 from tape to disk KMIT Ø1	-	-
18 DEC 1980	System Crash	Load ACOS-4 from tape to disk KMIT Ø1	-	-
23 DEC 1980	CPP Error System Check	Replace packages	CPU, I/O	EBM 63
16-19 JAN 1981	Power cut IOC Error CP Error System check	Switch error reaction of URC to ITR position	-	-
22 JAN 1981	Power Phase Missing. AC alarm when ON again, channel error console check	Replace package	CPU	EDN 1Ø
27 JAN 1981	Tape unit cannot be read	ON/OFF recognition error switch	-	-
28-29 JAN 1981	CP error. System check	Switch error reaction of URC to ITR position	-	-

Date	Trouble	Treatment for Recovery	Location of Defect	Replaced Parts
4-5 FEB 1981	CP error. System check	Replace packages and cables	CPU, I/O	ECN 54 EVD 43
1 FEB 1981	Power cut AC alarm	Press RESET	-	-
17 FEB 1981	Power cut AC alarm	Press RESET	-	-
26 FEB 1981	Power Phase missing AC alarm	Press RESET	-	-
12 MARCH 1981	Card reader step	Cleaning	-	-
7 APRIL 1981	Power interrupt AC alarm	Press RESET	-	-
29 APRIL 1981	Power cut AC alarm	Press RESET	-	-
19 MAY 1981	Power cut AC alarm	Press RESET	-	-
20 MAY 1981	Power interrupt AC alarm System crash	Press RESET System Crash dump	-	-
22 MAY 1981	Power interrupt AC alarm	Press RESET	-	-
2 JUNE 1981	Power cut AC alarm	Press RESET	-	-

Date	Trouble	Treatment for Recovery	Location of Defect	Replaced Parts
4 JUNE 1981	Power Interrupt AC alarm	Press RESET	-	-
18-23 JULY 1981	System Crash	System Crash dump	I/O	-
24 JULY 1981 11.40a.m	System Crash	System Crash dump	I/O	-
24 JULY 1981 2.30p.m	Power Cut AC alarm	Press RESET	-	-
24 JULY 1981 15.30p.m	System Crash	System Crash dump	-	-

A-4-3 The computer system is exclusively used for the following purposes:

	1)	Education	45 %
	2)	Research	45 %
and	3)	Management of KMIT	10 %

The computer system is under control of the Director of the Computer Center. The Computer is operated only by authorized officers who also inspect the nature of the work submitted. Users cannot operate the Computer personnally.

A-4-4 1) The commercial power supply is stable.

2) The power failures mostly occur during rainstorms.

3) The past experience of power failures is shown in Table 11.

Table 11 Trouble Record of Power Supply

Date	Contents of Power Failure	
16 JAN 1981	POWER CUT	3 hrs
22 JAN 1981	POWER PHASE MISSING	3 hrs
11 FEB 1981	POWER CUT	3 hrs
17 FEB 1981	POWER CUT	3 hrs
26 FEB 1981	POWER PHASE MISSING	3 hrs
7 APRIL 1981	POWER INTERRUPT	1 min
29 APRIL 1981	POWER CUT	3 hrs
19 MAY 1981	POWER CUT	3 hrs
20 MAY 1981	POWER INTERRUPT	1 hr
22 MAY 1981	POWER INTERRUPT	1 min
2 JUNE 1981	POWER CUT	3 min
4 JUNE 1981	POWER INTERRUPT	1 hr
24 JULY 1981	POWER CUT	3 min

(Table 12)

A-5 Expenditure borne by the Thai Government

in Million Bahts

Expenditure for / Year	Operation Budget*	Investment** Budget
1978	7.49	2.12
1979	8.59	7.20
1980	11.35	8.08
1981	14.92	37.35
1982	-	-

* Operation Budget includes salaries, wages, materials and general expenses

* Investment Budget includes equipment and buildings. The budgets are only that of the Faculty of Engineering, they do not include budget provided for the common facilities of KMIT.

A-5-2

Table 13 Consumables purchased for the Project

Field	Date	Name of Consumables	Quantity	Price (Approx.)	Remark
Electrical Engineering		For 1) students' work 2) staff work		300,000฿ per year	
Solid-state Tech.		For 1) students' work 2) staff work		200,000฿ per year	
Data Processing Tech.		For 1) students' work 2) staff work		400,000฿ per year	

A-6-1

Table 14 Utilization of the Equipments

Fields	Name of Equipments	Number of Days Utilized for the Past Year	Purposes of Utilization			
			Education	Research	Business	Others
Data Processing Tech.	1) NEC SYSTEM 300	- 200 days	6 days/week		-	
	2) DATA ENTRY	- 200 days	6 days week			
	3) HITAC SYSTEM 10	Average 3-4 days/week	2 days/ week	2 days/ week	-	
	4) AVR (on - line to the Computer system)	- 200 days	6 days/week			
Electrical Engineering Tech.	1) Epstein Iron Loss Test Sets	Average 3-5 days per week	Laboratory for Under-graduates 3 days/week	Research work for post-graduate & staff 2 days/week		
	2) Electronic Fluxmeter					
	3) DC Current Supply					
	4) Electronic Galvanometer					
	5) Precision DC Potentiometer					
	6) Universal Tachometer					
	7) Photocorder					
	8) DC Calibration Set					
	9) Precision Digital Meter					
	10) Digital AC Power Meter					
	11) X-Y Recorder					
	12) DC Amplifier					
	13) DC Magnetic Hysteresis Loop Tracer					
	14) 600 KV Generator		1 day/week	1 day/week		
	15) Power Press machine		1 day/week	1 day/week		
	16) Temp data acquisition system		1 day/week	1 day/week		
	17) Automotor Cor/windy Machine		3 days/week	2 days/week		
	18) Storage Oscilloscope		-	5 days/week		

A-6-2

Table 15 Use of Disk

No.	File Name	Description	Purpose	Size		OWNER
				Track	Cylinder	
1	ACOS-4	Disk Booking (Defective Track etc.)	-	0	0	System
2	APP PKLMLIB	NEC Application Package	General use	380	20	System
3	BM-CRS	5th Year Project	Research	114	6	Sopa
4	BM-MAS	"	"	114	6	"
5	CC	Student Records	"	95	5	Kittima, Wuttichai
6	CMA	"	"	19	10	"
7	CO	"	"	95	5	"
8	COURSE	"	"	114	6	"
9	ENG. CULIB	User Compile Unit	"	95	5	Kanehit
10	INDEX	Student Records	"	19	1	Kittima, Wuttichai
11	IXMAST	"	"	209	11	"
12	KANC	LANDSAT	"	95	5	Kanehit
13	MAS	Student Records	"	209	11	Kittima, Wuttichai
14	MASTER	"	"	190	10	"
15	MON-01	Telecom Stork	"	57	3	Kent
16	MOR. LMLIB	Master Research	"	38	2	Kittima, Wuttichai
17	NEW	"	"	95	5	"
18	NEWALL	"	"	95	5	"
19	NID	"	"	95	5	Anusak
20	NMAST	North Bangkok	"	38	2	North

Table 15 Use of Disk

No.	File Name	Description	Purpose	Size		OWNER
				Track	Cylinder	
21	NORTH. CO.	North Bangkok	Research	380	2	North
22	OLD	Master Research	"	114	6	Kittima
23	PASSI	"	"	19	1	Wuttichai
24	PSPOI	"	"	190	10	Wuttichai
25	RECOG.A	LANDSAT	Research	19	1	Kanchit,
26	REG. LMLIB	Registration Package	"	95	5	Wuttichai
27	REG. SLLIB	"	"	114	6	"
28	REG SL	"	"	38	2	"
29	SFILE	"	"	38	2	"
30	SLMOR	"	"	57	3	"
31	SOR-WORK	"	"	95	5	"
32	SUBJECT	"	"	38	2	"
33	THAICU	Master Research	"	19	1	Rungroj
34	UL. XXX	"		19	1	"
35	USER. CULIB	Math Lib		190	10	System

A-7 In connection with the topics of research

A-7-1 "Cooperation with industries", as stated in the minutes of discussion, is intended to cover both research and personnel training for solid state industries in Thailand. For example, practical knowledge concerning solid state devices gained from research activities at KMIT will be published and distributed to various technical centers and industries. Practical experiences acquired by students will also be directly beneficial to industrial product development.

A-7-2 By 1981, KMIT has these members working on pattern recognition. (Dr. Kosol, Dr. Pairash, Mr. Chom). One member Mr. Kanchit is doing doctorate degree research on pattern recognition at Hiroshima University. By 1981, two new members will be recruited (Mr. Warawoot, Mr. Supachoke).

A-7-3 KMIT can apply for budget from the Thai Government for consumable materials for solid state technology after the period of assistance is over, and adequate financial support from the Thai Government can be expected to provide fund for modest scale researches in this area. However, KMIT requires an arrangement whereby, supplies of these consumables in very small quantities (by industry standard) can be provided. Most manufactures of solid state technology consumables are not interested in supplying (selling!) small quantities of these consumables. In this regard, it may be suggested that, perhaps, related Universities can provide assistance in purchasing for KMIT. If this proposal is realized, then assurance for the continueing supply of basic consumables for solid state activity can be given.

A-8 Others

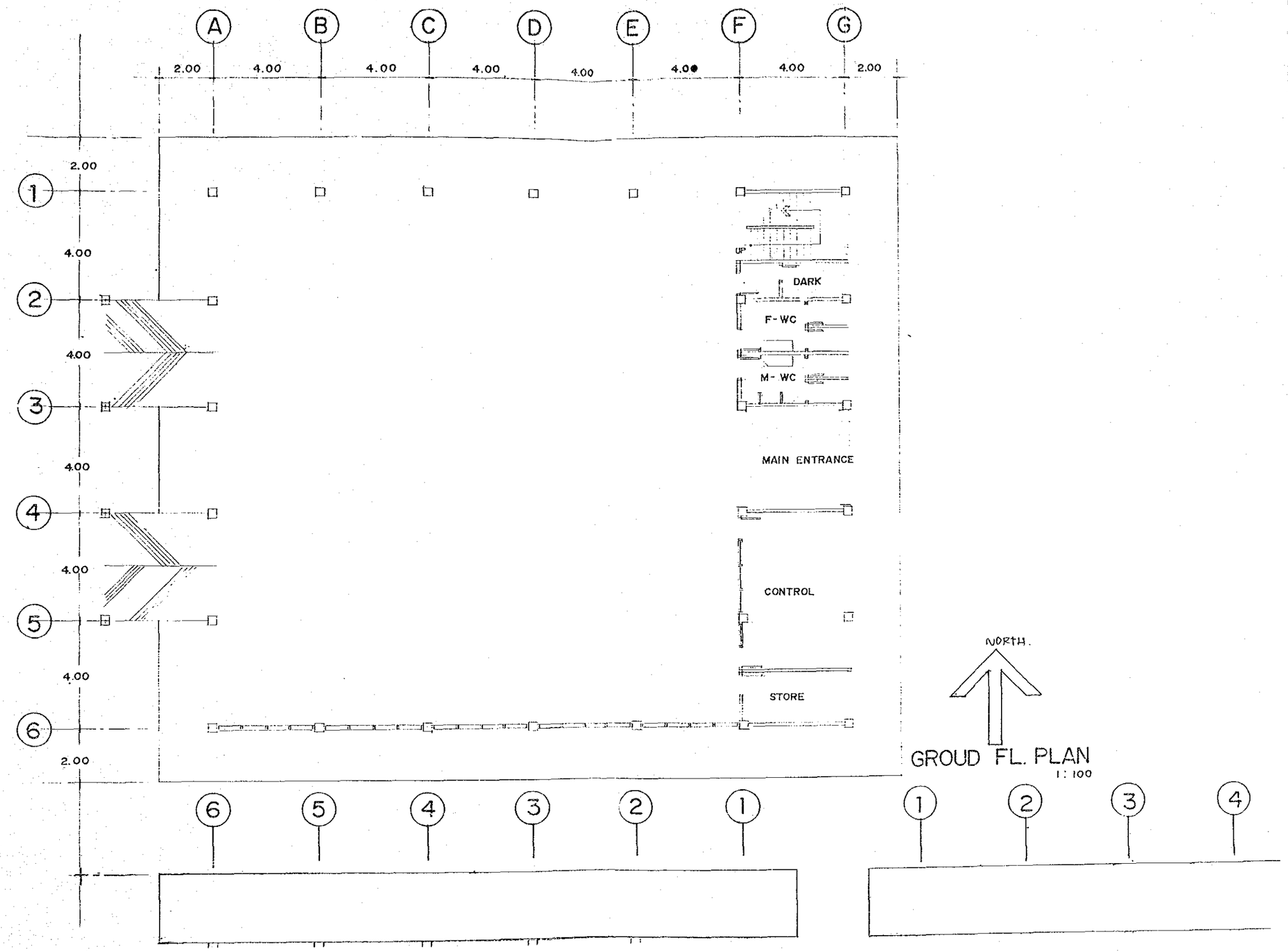
A-8-1 About the mutual cooperation agreements between KMIT and other technological institutions, there is only one memorandum on academic cooperation with Tokai University (end in 1981).

We are expecting cooperation on the following areas:

(1) Remote - sensing with the National Research Council of Thailand.

(2) Instrument as the National Point of Contact for the Regional Network of Instrument Technician Training Institutions in South East Asia and Pacific Countries of UNESCO.

A-8-2 We receive excellent understanding and cooperation for the Japanese experts in all three fields. We have no special requests for the Japanese experts.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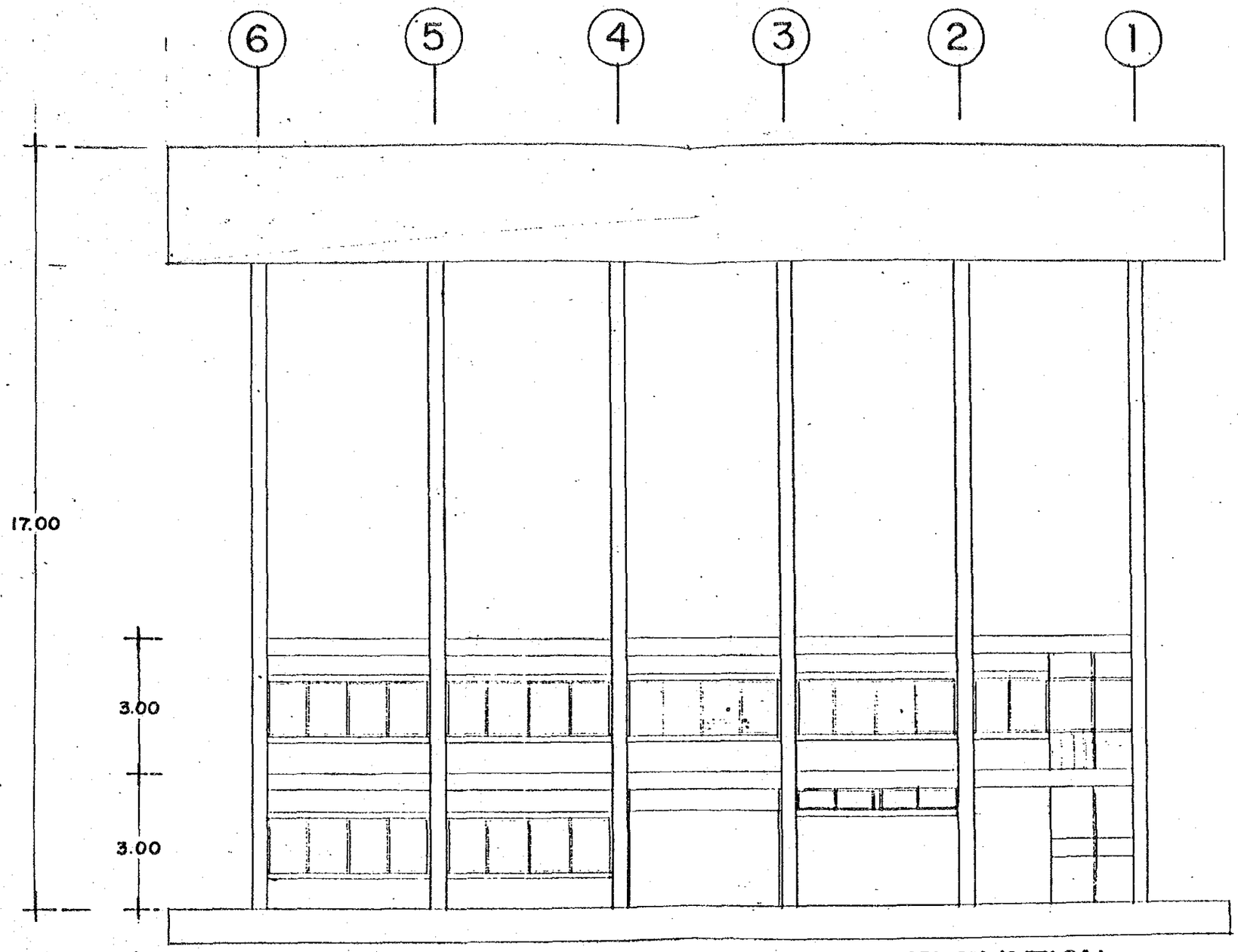

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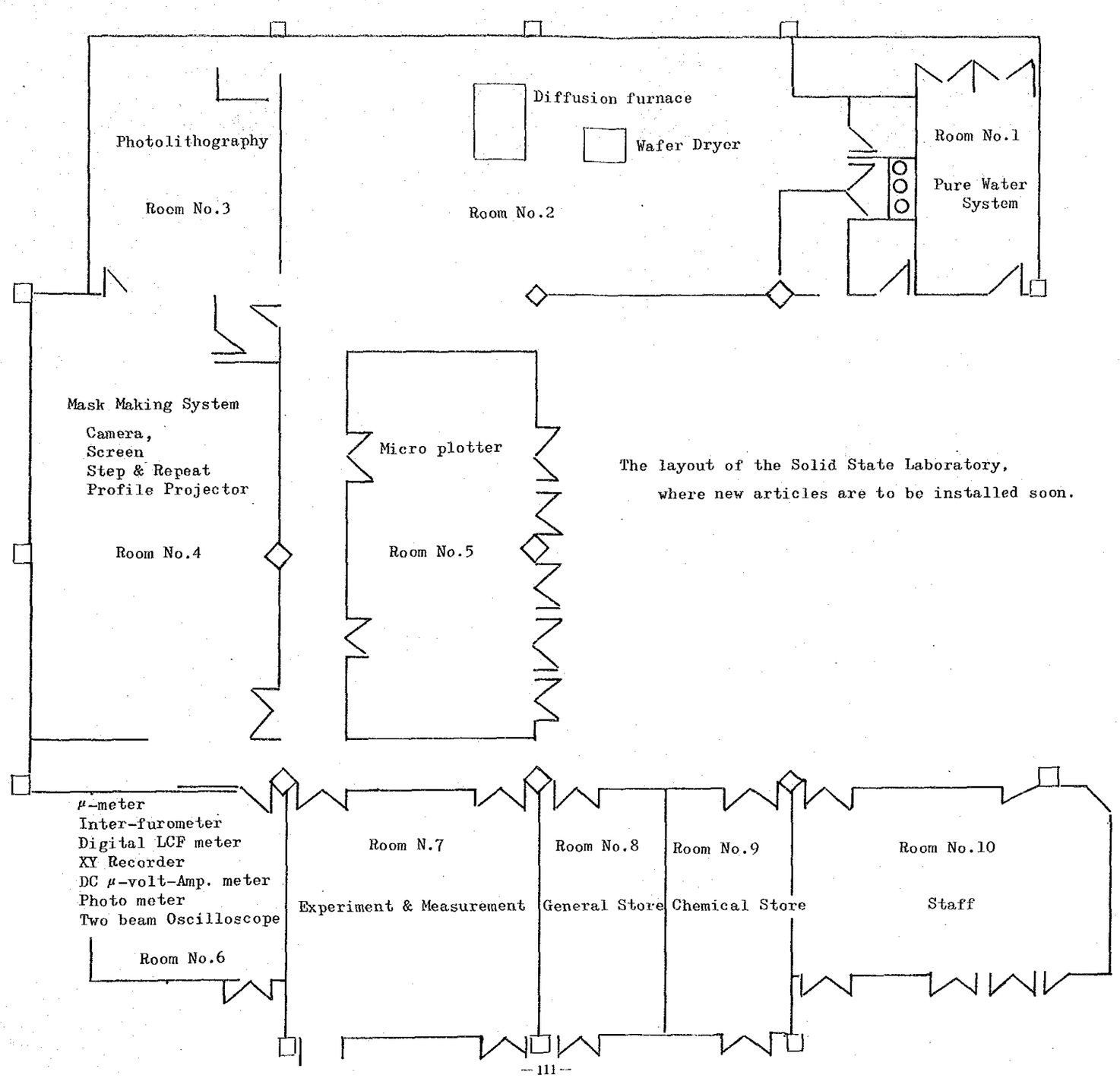

The layout of the Solid State Laboratory,
where new articles are to be installed soon.

JICA