

Monash University - Telecom Australia

Two Week Extension Course

on

BASIC DIGITAL TRANSMISSION SYSTEM THEORY

The adoption by Telecom of various digital transmission systems is increasing in momentum - the use of datel modems and PCM line systems in junction cables is well established and digital radio systems, optical fibre systems, digital coaxial cable systems, high speed DAV and DIV systems and digital subscriber reticulation are all under active study or being given consideration. It is clear that these digital systems will provide the basis of the transmission components of the future telecommunications network.

Against this background, the ROTEND Study highlighted the need for Telecom to take urgent action to develop its engineering knowledge-base in digital transmission theory and techniques. Arising out of consequent discussions between the General Managers, Engineering and Personnel, and the Director, Research, staff of the Transmission Branch of the Laboratories have been collaborating with staff of Monash University's Electrical Engineering Department to develop and present a two-week full-time course for Telecom engineers on this topic. The first course was presented by Telecom and University staff in May, 1981.

The ~~next~~ course will be similarly presented by Doctors D. Keogh and K. Pang of the University and by Doctors A. Gibbs, B. Smith, R. Coutts and Mr A. Quan of the Transmission Branch, Research. An outline of the course is attached.

The content of the course has been carefully chosen to reflect the special interests of Telecom, to provide an effective means of delivering essential knowledge in the limited time available, and to relate the content of the course to the needs of typical Telecom engineers working in the transmission field in HQ or the States. Special attention has been given in the development of the course content to the presentation of examples to link basic and applied theory with its application in Telecom's present or future digital transmission systems. The course will also be strongly tutorial in nature, and about half of the time set aside for exercises. This will allow examples to be discussed and worked through in small groups (of about five per tutor) and thus generate a more complete understanding of the course material. Lecture notes and an up-to-date text on the course material will also be provided to each engineer attending the course.

Only 25 persons will be enrolled in each course and attendance will be limited to Telecom engineers. The courses will be held at Monash University.

BASIC DIGITAL TRANSMISSION SYSTEM THEORY

COURSE OUTLINE

1. Linear Systems Dr K. K. Pang (Monash) 7 Lectures

Time domain and frequency domain, analysis of linear systems, including convolution and Fourier Transform. Application to Digital Transmission Systems.

2. Random Processes Dr D. B. Keogh (Monash) 7 Lectures

Basic probability theory, random time processes including auto-correlation and power spectrum. Response of transmission systems to random inputs.

3. Digital Transmission Dr B. M. Smith (Telecom) 9 Lectures

Fundamentals.

Linear representation of digital signals. Bandlimiting, inter-symbol interference. Nyquist pulse shaping, roll-off. Average power spectral density of digital signals. Error probability formula for multilevel digital signals.

Line Coding.

Rationale. Examples - conditioned diphase, AMI and HDB3. Physical description, average power spectral density.

Modulated digital signals.

Rationale. Examples, linear - digital AM (DSBAM, DSBAMSC, QAM, PM; VSBAM, SSBAM). Examples, nonlinear - digital FM. Time and frequency domain representations. Phase jitter tolerance. Application of baseband error probability formula to modulated digital signals.

4. Applications Dr A. J. Gibbs, Dr B. M. Smith, Dr R. P. Coutts, and Mr A. Quan (Telecom) 5 Lectures

Baseband transmission in pair cable.

Effect of impulse noise and compatibility with other services on a 4800 bit/s DDN signal. 2048 kbit/s line systems - crosstalk into similar systems, noise figure.

Data-in-Voice (DIV) performance.

2048 kbit/s DIV transmission in 2 or 3 contiguous super-groups between Melbourne and Sydney.

Digital Radio.

Example based on 140 Mbit/s digital radio system.

Introduction, single hop system design for flat fading, effect of frequency selective fading.

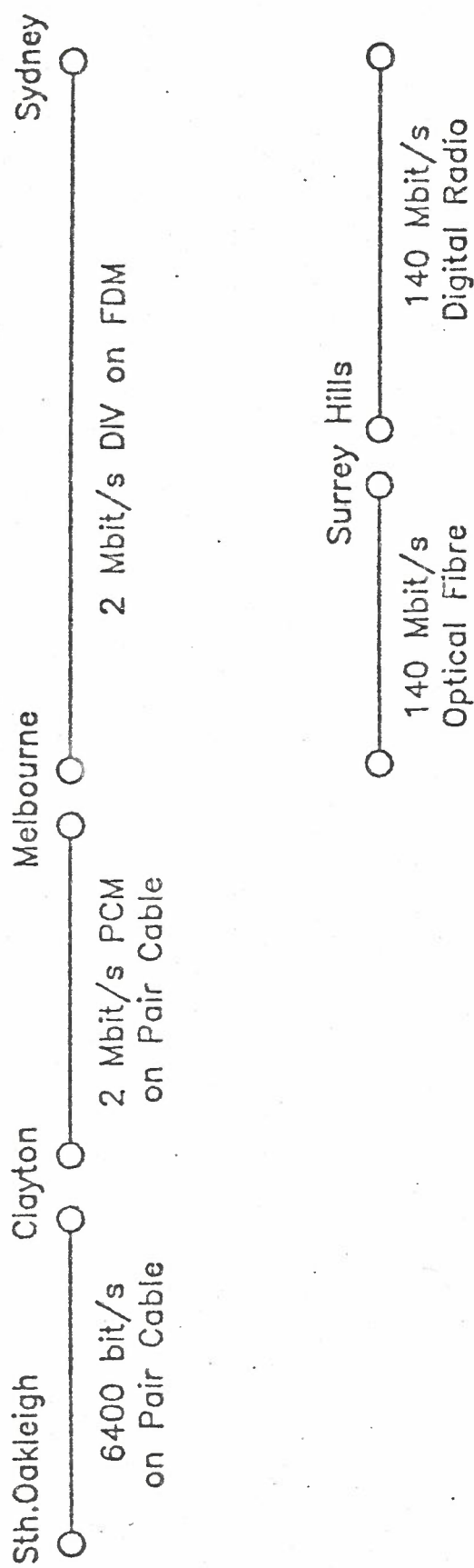
Optical Fibre Systems

Example based on 140 Mbit/s system.

Noise processes, regenerator section length design.

5. Summing Up and Review

General course revision and course evaluation.



TRANSMISSION COMPONENTS OF A TYPICAL
4800 BIT/S SERVICE ON DDS NETWORK -
USED TO ILLUSTRATE APPLICATIONS OF THEORY.

TELECOM COURSE TUTORS

	<u>Chapter 1</u>	<u>Chapter 2</u>	<u>Chapter 3</u>
1. 25/5 - 5/6/81	Alan Gibbs Khee Pang Don Keogh Bill Brown	Bernard Smith Reg Coutts Khee Pang Don Keogh	Don Keogh Alan Gibbs Reg Coutts Khee Pang
2. 10/8 - 21/8/81	Greg Cambrell Khee Pang Don Keogh David Morgan	Peter Hart Alex Quan Khee Pang Don Keogh	Don Keogh Alan Gibbs Reg Coutts Khee Pang
3. 8/2 - 19/2/82	Greg Cambrell Khee Pang Don Keogh David Morgan	Peter Hart John Sample Khee Pang Don Keogh	Don Keogh Phil Potter Robin Court & Bernard Smith Khee Pang
4. 9/8 - 20/8/82	Greg Cambrell Khee Pang Don Keogh David Morgan	Peter Hart Grant Nicholson Khee Pang Don Keogh	Don Keogh Khee Pang Stan Davies Andrew Jennings
5. 23/5 - 3/6/83	Kim Ng Khee Pang John Bennett Kishor Dabke	Peter Hart Paul Kabaila Khee Pang David Morgan	Alan Gibbs Ed Jones Don Keogh Khee Pang
6. 21/5 - 1/6/84	Greg Cambrell Khee Pang Don Keogh Kim Ng	Peter Hart Nick Demytko Khee Pang Don Keogh	John Hollow Khee Pang Don Keogh John Millott

BASIC DIGITAL TRANSMISSION SYSTEM THEORY COURSE
MONASH UNIVERSITY

9-20 AUGUST 1982

BRIEF PEN PORTRAIT OF PARTICIPANTS

RESEARCH

Transmission Branch

Andrew Martin

Engineer Class 3

Radio Systems Section

Bachelor of Engineering Communications 1975. WA Institute of Technology

October 1979 to present: Class 2, 3 Engineer.

Radio Systems Section working principally on high capacity digital radio systems for use in the trunk network. Other areas of work were in medium capacity systems and the digital radio concentrator.

June 1977 - October 1979: Class 1, 2 Engineer

Solid state electronics section working on analysis of semi conductor surface layers and whisker growth in transistors.

Feb 1976 - June 1977: Class 1 Engineer

Construction Branch. Western Australia. Working on 12 mHz Coaxial cable installation Port Hedland to Mt. Newman.

Customer Systems and Facilities Branch

Peter Bernhard

Engineer Class 2

Business Communications Section.

Bachelor of Electrical Engineering 1976, Footscray Institute of Technology

Post-Grad Diploma (Digital Control 1981 F.I.T.)

1977-1980 E1

Reference measurements section - new "Speaking Clock" design (Microprocessor design work).

1980-1982 E2

Current position - Further microprocessor design work - I.S.D.N. work-investigations relating to Integrated Business Systems (including local Area Networks and Integrated Business Exchanges).

Telecommunications Technology Branch

Sasti Sastradipradja (Sasty)

Engineer Class 4

Antennas & Propagation Section

Bachelor of Electrical Engineering 1962 - University of Adelaide.

Engineer Class 1 - Department of Civil Aviation worked on Radio Navigational Aid and Communication Systems.

Research Engineer with the National Research Centre. - Indonesia

Research Engineer on Microwave Antennas at the Technical University of Eindhoven - Netherlands.

PMG Department - Radio Section - Adelaide, S.A. worked on the installation design and maintenance of Television and Broadcasting Stations.

Engineer in charge of the Antenna Research activities in Telecom Research Laboratories.

HEADQUARTERS

Transmission Planning Branch

Joseph Kovess (Joe)
Engineer Class 3
Inter-exchange Transmission Section
Bachelor of Electrical Engineering 1971, Monash University

Pre 1979, with the Engineering Training Section.
Since 1979, Transmission Planning Branch, involved with the planning of the intercapital trunk routes and the introduction of optical fibre system and digital radio systems into the network.

Line Transmission Equipment Construction Branch

Mike Harrison (Mike)
Engineer Class 3
Analogue SADAP Section
Bachelor of Engineering 1963 - University of Tasmania

4 years with Burnie District Works Division - Tasmania
10 years in Papua New Guinea with Broadband Installation -
Exchange Installation Operations and International Telecommunications
18 months LTEC Branch Project Manager - Provision of DDN Transmission facilities - provision of Digital on Analogue Transmission Equipment.

Line Transmission Equipment Construction Branch

Brian Wharton
Engineer Class 3
Analogue Design Section
Diploma of Electronics Engineering 1978 - Bendigo College of Advanced Education.

1978 - 1980

Planning and Programming Branch - Switching and Facilities Country Section - Victoria.

1980 - 1981

Line Transmission Equipment Construction Branch - Analogue Design Section.

Transmission Planning Branch

Alan Dubberley
Engineer Class 3
Headquarters
Bachelor of Science University of Aston - MBA Melbourne

4 years Marconi England - 1 year Subscribers Equipment Headquarters - 2 years Parramatta Operations - 1 year NP & O, HQ and 5 years Transmission Planning. Currently involved with Subscriber Networks in urban and country areas.

HEADQUARTERS (Contd)

Radiocommunications Construction Branch

David Kerr
Engineer Class 3
Spectrum and Design Section
Associate Diploma Radio Engineering 1959, RMIT
Graduate Diploma Management 1978, RMIT.

1975 - 1982

Small capacity and Broadband radio relay systems provisioning and design, digital sound channels over TV relays, DAVID, DAV, high capacity digital paging design.

More recently, analogue radio relay systems with increasing involvement in digital radio or digital on analogue systems.

Network Operation Branch

Dan Hauw
Engineer Class 3
Long Line and Radio Service Section
Bachelor of Electrical Engineering 1969, Monash University
Post Graduate Diploma in Industrial Management 1973 - Swinburn College of Technology.

1969 - 1976 Radiocommunications Construction Branch

1976 - 1980 Transmission Network Design Branch

1980 to present - Network Operations Branch.

Transmission Network Design Branch

Ross Kelso
Engineer Class 4
Facilities Application Section
Bachelor of Electrical Engineering

1967 - University of Queensland

1969 - University of Queensland

Served as an Engineer in Telecom Queensland, Australian Army and Telecom HQ Research, Construction and Design Areas.

Specialises mainly in transmission but has also been involved with switching. Received Development Training Programme Award to work at ITT Laboratory - Spain - 1979-80.

Telephone Switching Planning Branch

Kevin Dwyer
Engineer Class 3
Telephone Exchange Systems Section
Bachelor of Electrical Engineering 1966 - Melbourne University.

Covers operations and maintenance of Telephone Exchanges the monitoring and determination of standards of service within the Metropolitan Network, the provision of interexchange junction links within the Metropolitan Network.

HEADQUARTERS (Contd)

Experience in planning of Tandem Switching Exchanges in the Metro Network modifications to existing equipment evaluation of operation systems within the AXE Systems and in facility proposals in Telephone Exchange System Planning.

AXE Project Team

Ross McGregor
Engineer Class 1
Bachelor of Engineering - Melbourne University

With Telephone Switching Construction Branch (Vic) then Planning and Programming (Vic) - Switching & Facilities Country
Present AXE Project Team HQ.

SOUTH AUSTRALIA

Network Service and Design Branch

Christopher Souter
Engineer Class 2
Radio Section
B. Sc 1971 - Adelaide University
B.E. Hons 1972 - Adelaide University
M.Sc 1975 - Bradford University - U.K.

Radio Com. Maintenance: Acceptance testing - Route evaluation for 140/MB/s Digital Transmission.

Construction Branch

David Bayer
A/g Engineer Class 3
Equipment Installation No. 1 Section
Bachelor of Engineering 1963 - Adelaide University

Switching Equipment Installation - Broadband Carrier Installation and Digital Data Network Installation.

WESTERN AUSTRALIA

Regional Operations Branch

Hugh Lantze
Engineer Class 3
Trunk Service Section
Associateship 1970 - W.A. Institute of Technology.
Master Degree Electronic Engineering 1972 - N.U.F.F.I.C. Holland

1972 - 1975 at HQ Melb. Switching Network Planning - 1975-80 Exchange Installation Project Management (W.A.)

Most work involved in large processor controlled exchange installation.
1980-82 Management of detailed installation associated with large SPC Exchange.

WESTERN AUSTRALIA (Contd)

Construction Branch

Luciai Luciano Elio (Luci)
Engineer Class 3
Country Installation Section
Bachelor of Electrical Engineering 1971 (Hons) University of W.A.

1971-72 with Transmission Planning and Country Districts, Switching and Transmission.

1973 - Present HQ Melbourne. HQ Melb T & L Planning & Long Line Equipment - Primary Works (W.A.) Cable Installation - CBI scholarship UK; GEC Telecommunications Coventry; PCM Digital Transmission Optical Fibre Systems. With Radio Section (W.A.) Then Construction Branch as Wellington Co-ordinator - Construction Branch Project Engineer East-West Radio Project - Management of Installation of New East-West Radio System.

VICTORIA

Network Service Branch

Keith Lierse
Engineer Class 3
Trunk Network Service Section
ARMIT Communications Engineering 1963

Installation of all types of switching systems. Maintenance of all types of transmission systems with particular emphasis on acceptance of newer types of FDM and TDM Equipment.

Commercial Development Unit

Peter Weymouth
Engineer Class 2
Data Switching and Transmission Section
Bachelor of Engineering 1972 - M. Eng. Sc 1975 - Melbourne University

Experience with:
Commercial Development Laboratory Equipment design and testing Telex and Data projects, DDS and DDN - also provision and maintenance projects special services.

TASMANIA

Network Service and Design Branch

Gary Eiszele
Engineer Class 2
Network Service Section
Bachelor of Engineering 1971 - University of Tasmania

With Southern Operations External Plant and then project Engineer Exchange Installation - 1 year with Department of Public Utilities Papua New Guinea. Engineer in charge of switching then Branch head Switching and Subs. Equip. Sections.

Assistant Secretary controlling switching, subs bearers and transmission, External Plant, general services. In charge of Construction Programme in Papua New Guinea.

1980 - to present - Network Performance - Tasmania

NEW SOUTH WALES

Peter Barrett
Engineer Class 3
Trunk Network Service Section
Bachelor of Engineering 1967 - University of NSW

Pre-Telecom

10 years with AWA Radio Engineering Design and 2 years with Plessey Research Labs in England during which time he completed an advanced communications course - London University.

Presently responsible for developing Xmission Practices and for overseeing the Xmission performance & maintenance of N.S.W. Broadband and small capacity cable network.

Commercial Development

Mike Snowdon
Engineer Class 2
Telegraphs & Data Switching Section
Bachelor of Engineering 1978 (Hons) University of N.S.W.

Most recent activities include design work for TACONET, Processor memory design, solid state design and some work with mainframe UNIVAC computers.

Construction Branch

Harry Battam
Engineer Class 2
Metro Installation No.3
Bachelor of Engineering 1976 - University of NSW.

Recent involvement has been with PCM Systems and the Digital Data Network, prior to that, with ARM and ARF Equipment.

QUEENSLAND

Network Service & Design Branch

Alex Kosiek (Alex)
A/g. Engineer Class 3
Radio Section (Radiocom Design Group)
B.E. (Hons) 1972 University of QLD.

1973 - 77 Installation of National and Commercial TV Plant.
1977 - 78 Installation of Trial Analogue Radio Concentrator.
1978 - 81 Design of Medium Capacity and Subscribers R/T Systems.
1981 - 82 Radio Comm Design of R/T Systems including Broadband, Medium Capacity, Subs, Mobile Telephone Paging Systems.

QUEENSLAND (Contd)

North Queensland Construction Branch

Jim Crosthwaite
Engineer Class 2
North Queensland Construction Section
Townsville
Bachelor of Engineering 1974 - James Cook University - Townsville

Transmission Equipment Installation including Low Capacity Systems in North Queensland area.

Planning & Programming Branch

Les Rodgers (Les)
Engineer Class 3
Forward Planning Section
Graduated with Associated Diploma in Electrical Engineering QIP 1970
Post Graduate studies at Queensland University

Joined PMG Dept 1951 as Technician in Training
Appointed Trainee Engineer 1966
Worked as an Engineer in QLD Radio Section in Broadcasting and Radiocommunications for 7 years.
Appointed Engineer Class 3 in Planning Branch (QLD) in 1977.
Worked with Transmission Lines Planning for 3 years including a period as a Member of a Team which produced the 1980-1990 QLD State Development Plan

In 1980 transferred to Construction Branch as Project Engineer for the installation of the Roma-Hughenden Broadband Radio System. About to Transfer back to Planning Branch in the Forward Planning Section

MONASH UNIVERSITY
DEPARTMENT OF ELECTRICAL ENGINEERING

and

TELECOM AUSTRALIA

BASIC DIGITAL TRANSMISSION SYSTEM THEORY

Timetable for August 9-13, 1982.

	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY
9.00	WELCOME	RANDOM PROCESSES 2.	RANDOM PROCESSES 4.	RANDOM PROCESSES 6.	RANDOM PROCESSES 8.
10.00	DIGITAL COMMUNICATION SYSTEMS				
10.15	B R E A K				
11.15	LINEAR SYSTEMS 1.	LINEAR SYSTEMS 3.	LINEAR SYSTEMS 4.	LINEAR SYSTEMS 5.	LINEAR SYSTEMS 6.
12.15	LINEAR SYSTEMS EXAMPLES.	TUTORIAL LINEAR SYSTEMS	TUTORIAL LINEAR SYSTEMS	TUTORIAL LINEAR SYSTEMS	TUTORIAL LINEAR SYSTEMS
	L	U	N	C	H
1.15	RANDOM PROCESSES 1.	RANDOM PROCESSES 3.	RANDOM PROCESSES 5.	RANDOM PROCESSES 7.	RANDOM PROCESSES 9.
2.15	LINEAR SYSTEMS 2.	TUTORIAL RANDOM PROCESSES	TUTORIAL RANDOM PROCESSES	TUTORIAL RANDOM PROCESSES	TUTORIAL RANDOM PROCESSES
3.15					
3.30					
5.00	TUTORIALS - LINEAR SYSTEMS & RANDOM PROCESSES	TUTORIAL LINEAR SYSTEMS	TUTORIAL RANDOM PROCESSES	TUTORIAL LINEAR SYSTEMS	TUTORIAL RANDOM PROCESSES

MONASH UNIVERSITY

DEPARTMENT OF ELECTRICAL ENGINEERING

BASIC DIGITAL TRANSMISSION SYSTEM THEORY

Tutorial Groups, August 16 - 20, 1982

1
Room G15/6

Andrew Martin
Alan Dubberley
David Kerr
David Bayer
Keith Lierse
Alex Kosiek

2
Room G10/6

Peter Bernhard — Res.
Mike Harrison — LTEC
Ross McGregor — AXE Project Team
Hugh Lantze — Trunk Service, W.A.
Peter Weymouth — Comm. Dev., VIC.
Jim Crosthwaite — Const., North Qld.

3
Room G16/4

Sasty Sastradipradja
Brian Wharton
Dan Hauw
Luci Elio
Gary Eiszele
Mike Snowdon

4
Room 105/6

Joe Kovess
Kevin Dwyer
Ross Kelso
Christopher Souter
Les Rodgers
Harry Battam

Tutors

Digital Transmission

1. Khee Pang
2. Don Keogh
3. Stan Davies
4. Andrew Jennings

Applications

To
be
allocated

MONASH UNIVERSITY
DEPARTMENT OF ELECTRICAL ENGINEERING

and

TELECOM AUSTRALIA

BASIC DIGITAL TRANSMISSION SYSTEM THEORY

Timetable for August 16-20, 1982.

MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY
9.00				
DIGITAL TRANSMISSION 1.	DIGITAL TRANSMISSION 5.	DIGITAL TRANSMISSION 8.	BASEBAND TRANSMISSION IN PAIR CABLE 1.	OPTICAL FIBRE SYSTEMS 1.
10.00	B	E		
10.15	R	A		
	K			
DIGITAL TRANSMISSION 2.	TUTORIAL	TUTORIAL	BASEBAND TRANSMISSION IN PAIR CABLE 2.	OPTICAL FIBRE SYSTEMS 2.
11.15				
TUTORIAL	DIGITAL TRANSMISSION 6.	DIGITAL TRANSMISSION 9.	TUTORIAL	TUTORIAL
12.15				
L	U	N	C	H
1.15				
DIGITAL TRANSMISSION 3.	TUTORIAL	TUTORIAL		COURSE REVISION
2.15				
DIGITAL TRANSMISSION 4.	DIGITAL TRANSMISSION 7.	TUTORIAL	DIGITAL RADIO	QUESTIONS
3.15				
3.30	B	R	E	
	A	K		
TUTORIAL	TUTORIAL	TUTORIAL	TUTORIAL	COURSE EVALUATION
5.00				

MONASH UNIVERSITY
DEPARTMENT OF ELECTRICAL ENGINEERING

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TELECOM AUSTRALIA

BASIC DIGITAL TRANSMISSION SYSTEM THEORY

Timetable for May 23-27, 1983.

	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY
9.00					
	WELCOME	RANDOM PROCESSES 2.	RANDOM PROCESSES 4.	RANDOM PROCESSES 6.	RANDOM PROCESSES 8.
10.00	DIGITAL COMMUNICATION SYSTEMS				
10.15			B R E A K		
	LINEAR SYSTEMS 1.	LINEAR SYSTEMS 3.	LINEAR SYSTEMS 4.	LINEAR SYSTEMS 5.	LINEAR SYSTEMS 6.
11.15					
	LINEAR SYSTEMS EXAMPLES.	TUTORIAL LINEAR SYSTEMS	TUTORIAL LINEAR SYSTEMS	TUTORIAL LINEAR SYSTEMS	TUTORIAL LINEAR SYSTEMS
12.15					
	L	U	N	C	H
1.15					
	RANDOM PROCESSES 1.	RANDOM PROCESSES 3.	RANDOM PROCESSES 5.	RANDOM PROCESSES 7.	RANDOM PROCESSES 9.
2.15					
	LINEAR SYSTEMS 2.	TUTORIAL RANDOM PROCESSES	TUTORIAL RANDOM PROCESSES	TUTORIAL RANDOM PROCESSES	TUTORIAL RANDOM PROCESSES
3.15					
3.30			B R E A K		
	TUTORIAL LINEAR SYSTEMS	TUTORIAL RANDOM PROCESSES	TUTORIAL LINEAR SYSTEMS	TUTORIAL RANDOM PROCESSES	TUTORIAL RANDOM PROCESSES
5.00					

MONASH UNIVERSITY
DEPARTMENT OF ELECTRICAL ENGINEERING

and

TELECOM AUSTRALIA

BASIC DIGITAL TRANSMISSION SYSTEM THEORY

Timetable for May 30-June 3, 1983.

	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY
9.00					
10.00	DIGITAL TRANSMISSION 1.	DIGITAL TRANSMISSION 5.	DIGITAL TRANSMISSION 8.	BASEBAND TRANSMISSION IN PAIR CABLE 1.	OPTICAL FIBRE SYSTEMS 1.
10.15	B R E A K				
11.15	DIGITAL TRANSMISSION 2.	TUTORIAL	TUTORIAL	BASEBAND TRANSMISSION IN PAIR CABLE 2.	OPTICAL FIBRE SYSTEMS 2.
12.15	TUTORIAL	DIGITAL TRANSMISSION 6.	DIGITAL TRANSMISSION 9.	TUTORIAL	TUTORIAL
1.15	L U N C H				
2.15	DIGITAL TRANSMISSION 3.	TUTORIAL	TUTORIAL	DIGITAL RADIO	COURSE REVISION
3.15	DIGITAL TRANSMISSION 4.	DIGITAL TRANSMISSION 7.	TUTORIAL		QUESTIONS
3.30	B R E A K				
5.00	TUTORIAL	TUTORIAL	TUTORIAL	TUTORIAL	COURSE EVALUATION

BASIC DIGITAL TRANSMISSION SYSTEM THEORY COURSE - 1984

MONASH UNIVERSITY

21 MAY - 1 JUNE

BRIEF PEN PORTRAIT

OF

PARTICIPANTS

ENGINEERING DEPARTMENT HEADQUARTERS

Radiocommunications Construction Branch

Neil WAIN

Trunk Systems Section

Engineer Class 4

Radio Engineering, Royal Melbourne Institute of Technology, 1965

In September 1981 staff rearrangements in the Trunk Systems Section required that he assume responsibility for provisioning of broadband trunk radio equipment for New South Wales in that Section.

In the two years that he has occupied that position, he has been responsible for the design and provision of the New South Wales 1982/83, 1983/84 and 1984/85 ECP, including 9601800CH long haul analogue systems and 34 140Mbit/s digital radio relay systems.

Transmission Network Design Branch

Symon ROZENTAL

Network Utilisation Section

Engineer Class 3

Associate Diploma (Electronic Engineering) - 1968 RMIT

Fellowship Diploma (comm. Engineering) - 1971 RMIT

Bachelor of Engineering Degree - 1972 RMIT

Experience - Experience in transmission network planning and design, particularly with the planning aspect of PCM 30 introduction in the Melbourne telephone network.

Recent experience includes the issue of the tender schedule calling for Digital Radio Concentrator System for rural and remote telephone customers and the evaluation and selection of electronic line concentrator units for the subscribers network.

Mr. Rozental is currently undertaking work related to Network Design Standards and provisioning rules for Urban Optical Fibre Transmission Systems.

Network Operations Branch

Alan MILES

Long Line & Radio Service Section

Engineer Class 3

Bachelor of Engineering with Distinction

1979, R.M.I.T.

Experience

1980-81 Research Department, Computer Applications & Techniques Section

1981-83 Class 1 Engineer on rotation

1983-84 Network Operations Branch, Long Line & Radio Service Section

Line Transmission Equipment Construction Branch

Dominic CZARNOTA
Bearer and Test Equipment Section
Engineer Class 3

Diploma of Engineering (Electronic) 1978.
Caulfield Institute of Technology (Now Chisholm).

Experience

1979-80

- a. Engineer Class 1 Victoria, with Field Engineering and Trunk Network Service. Duties:- Project work and investigations of transmission problems associated with the Melbourne Trunk Terminal Operations.
- b. Engineer Class 2 (Acting) Duties : Project Work within the Repair and Special Projects Group of Trunk Network Services, Victoria.

1980-81

In November 1980, promoted to Engineer Class 2, Line Transmission Equipment Construction Branch. Duties: Tender schedule preparation, and tender evaluation of transmission testing instruments.

1981-1984

From October 1981, acted as Engineer Class 3, Line Transmission Equipment Construction Branch, responsible for the functional control at provisioning of transmission testing instruments.

RESEARCH DEPARTMENT - HEADQUARTERS

Transmission Branch

Peter HICKS

Radio Systems Section

Engineer Class 2

B.E. (Elec) Monash May 1971
B.Sc. Monash April 1975
M. Eng. Sc. Monash December 1982

Experience

March 1971 - January 1972:

Equipment Development Section Research Laboratories

January 1972 - February 1981:

Radio Systems Section, Eng. Cl. 2.

Development of instrumentation to measure noise levels and RF Field Strength for Mobile Services.

Laboratory Evaluation of Radio Equipment.

Computer Prediction of Field Strength. Statistical Analysis of measured Field Strength for Mobile Radio Services.

February 1981 - August 1981:

Line and Data Systems Section. Eng. Cl. 2.

Design of a measurement system to assess the performance of Remote Clock Oscillators forming part of a Digital Network Synchronisation system.

Mark HAYES

Circuit and System Theory Section

Engineer Class 2

Degree of Bachelor of Science (Maths), University of Adelaide; April 1980

Degree of Bachelor of Engineering (1st Cl. Hons); University of Adelaide; May 1981.

Experience

2/2/81-31/1/82: Engineer Class 1 in Circuit & System Theory, Transmission Br. Research Dept.

- Investigation of Adaptive 2 wire/4 wire terminating set
- Investigation of Interference from Multimetering pulses

1/2/82-1/8/82: Engineer Class 1 in Transmission Network Design Branch, Engineering Dept. HQ.

- Development of a semiautomatic Measurement System for characterisation of cables (Crosstalk & Insertion loss)

2/8/82-8/5/83: A/g Engineer Class 2 in Network Studies Section, Switching & Signalling Branch, Research Dept.

- Investigation of ISDN Customer Access & Overseas Field Trials
- Preparation of Contributions for Meetings of CCITT WPs XI/4 & XI/6

RESEARCH DEPARTMENT (HEADQUARTERS) (Contd)

9/5/83 to date: Engineer Class 2 in Circuit & System Theory, Transmission Branch, Research Dept.

- Investigation of proposed Subscriber Line Audio Processing Circuit for use in AXE Phase 3.

Telecom Technology Branch

Peter MURRELL

Richard FLAVIN
Satellite Technology & EME Section
Engineer Class 4

- BSc (PHYSICS) - Tufts Univ; Boston, Mass. (USA) 1958
- MSc (PHYSICS) - Univ. of Connecticut (USA) - 1964

Experience

- | | |
|--------------|--|
| 1958-1964 | Research Scientist Plasma Physics
United Technology Research Labs (USA) |
| 1964-1971 | Microwave Engineer System Front End Receivers Raytheon,
HewlettPackard, Control Data Corp. (USA) |
| 1971-Present | Research Engineer Radiometers, Satellite Technology, Earth
Space Propagation Microwave Component Technology Telecom
Research Laboratories. |

COMMERCIAL SERVICES DEPARTMENT - HEADQUARTERS

Data Engineering Branch

Robert HARDING
Digital Data Network Section (DDN)
Engineer Class 3
B.E. RMIT. 1976

Experience

Development of Software Package for Traffic Analysis. Preparation of documents for the development of DDN.

ENGINEERING DEPARTMENT - N.S.W.

Design & Practices Branch

Paul FRALEY
ICM Project Group
Engineer Class 4
B.E. Sydney 1977
M.E. Sydney 1982

Experience

Has worked in Switching Design & Practices Section, Traffic Engineering Section and Telegraph & Data Switching Section. The last 2½ years have been with Network Management where he has worked on the ICM project for the last 19 months.

Paul FRALEY
ICM Project Group
Engineer Class 4
B.E. Sydney 1977
M.E. Sydney 1983

Experience

Has worked in Switching Design & Practices Section, Traffic Engineering Section and Telegraph & Data Switching Section. The last 2½ years have been with Network Management where he has worked on the ICM project for the last 19 months.

Field Engineering Branch

Peter CHIN
Newcastle Field Engineering Section
Engineer Class 3
B.Sc. (Eng) Queen's 1959

Experience

Was Deputy Director/Director of the Selangor Region of Malaysian Telecom for 2½ years before migrating to Australia in 1978. Since then he has been with Newcastle FES as E1, E2 on External Plant Planning until recent (Dec 83) appointment as E3 (transmission).

David GILLESPIE
North Coast Field Engineering Section
Engineer Class 2
B.E. NSWIT 1973

Experience

Was involved in Internal Plant installation for 6 years following appointment as E1. Most recent 5 years have been in External Plant Planning.

ENGINEERING DEPARTMENT - N.S.W. (Contd)

Colin MOCK
Monaro Field Engineering Section
Engineer Class 2
B.E. (Hons) NSW 1976

Experience

Was involved in performance monitoring, acceptance testing, upgrade projects etc on analogue transmission systems and equipment from 1976-78. Since then has been involved in operational aspects of switching equipment including AXE introduction and Packet Switching.

Planning & Programming Branch

Graham JAY
Public Data & Special Services
Network Planning
Engineer Class 4
B.E. QLD 1973

Experience

Initially (1973-76) worked in Planning Branch, Qld, on switching equipment including Brisbane tandem n/w design. Transferred to Planning Branch, NSW, in 1976 on country, metro and telex exch plg. (7679), and on DDN planning since then.

ENGINEERING DEPARTMENT - VICTORIA

Construction Branch

Les RAMSAY
Broadband Installation Section
Engineer Class 3
B.E. (Electrical) Monash University. 1971

Experience

Has been working in Broadband Installation for the last five years.

Has knowledge of transmission and optical fibre systems. Associated with the design and provision of digital radio systems and radio communications. In the last two years has been involved in the design and installation of transmission systems, particularly broadband radio.

ENGINEERING DEPARTMENT - QUEENSLAND

Construction Branch

Peter WOOD
Radiocom. Design Section
Engineer Class 3

Diploma Electronic Engineering from Swinburne College 1968.

Experience

1969 - 73	Engineer Class 1 in Headquarters Radio Branch, Radiocom maintenance and provisioning areas.
1973-76	Worked for Siemens A.G. in Munich, in the Technical Department. (Parts lists preparation, liaison between Laboratory and Factory, etc).
1976 - 78	Engineer Class 2 in Headquarters Radiocom Construction Branch, Trunk Systems Provisioning, mainly Alice Springs-Tennant Creek System.
1978 - Present	Engineer in Queensland Radio Section, operations and design areas.

Construction Branch

Barry CHASELING
Metropolitan Installations No 1 Section
Engineer Class 2

B.E. (Electrical Hons 2B) at Queensland University 1980.

Experience

Approximately 3 years in Telephone Switching Equipment Installation including SPC exchanges, digital switching equipment (AXE GSS. D. and RSS.D), Analogue equipment exchanges, DC Power conversion and storage, junction provisioning (PCM and physical).

ENGINEERING DEPARTMENT - W.A.

Major Facilities Group

Kevin BOYLE
Customer Networks & Equipment Section
Engineer Class 3

Associateship in Communications Engineering, Western Australian Institute of Technology - 1967.

Experience

Until 1983 in Construction Branch Installation of Microwave Radio Systems and Major Coaxial Cable Equipment. Moved to Customer Networks & Equipment in 1983 as Technical Specialist for Public Data Networks. Responsible for Telex and Data Switching as well as Telegraph and Data Terminals Support in Western Australia.

Planning & Programming Branch

Peter KENT
Forward Planning Section
Engineer Class 3

Bachelor of Applied Science (Electronic Engineering) Western Australian Institute of Technology - 1971.

Experience

1972 - 1974	Telecom-Geraldton WA as E1 and E2
1975 - 1977	Telecom Headquarters Lines Construction
1977 - 1979	Telecom WA Transmission & Lines Planning

Development Training Award (Telecom) at Standard Telecommunications Laboratories, Essex, UK, 8 months.

1980	British Telecom Headquarters 2 months
1981-1984	Telecom WA Forward Planning Section

Lecturer on AXE Courses in all States
Author of several Forward Planning Studies on WA Network Development.

ENGINEERING DEPARTMENT - TASMANIA

Field Engineering Branch

Francis D'EMDEN
Transmission & Non-SPC Switching Section
Engineer Class 3

B. Eng (Hons)
University of Tasmania 1969
M. Eng. Sc.
University of Tasmania 1973
(Thesis title "Noise in Delta Modulation")

Experience

1971-1980	District Operations, Launceston, in particular, external plant maintenance design & planning.
1980	Telephone Switching Planning Branch, HQ ISD Penetration Studies and new facility implementation.
Oct 1980-1982	District Engineer, Launceston District Engineer, Burnie
Jan 1983 to date	Present position which primarily involves oversight of States non-SPC exchanges. Liaison with maintenance staff on switching matters requiring Engineering Dept., attention. Maintenance Practices & Procedures for transmission and non-SPC exchange equipment.

OVERSEAS TELECOMMUNICATIONS COMMISSION (AUSTRALIA)

Planning Branch

BIOGRAPHY - MR HEADFORD

NAME : PETER HEADFORD
CLASSIFICATION : ENGINEER CLASS III
SECTION : SUBMARINE CABLES
BRANCH : PLANNING
TELEPHONE : (02) 230 5454
QUALIFICATIONS : DIPLOMA RADIO ENGINEERING
BACHELOR OF ELECTRICAL ENGINEERING
MASTER OF ENGINEERING SCIENCE

EXPERIENCE : MR HEADFORD JOINED OTC IN 1970 AND UNTIL 1984 HE WORKED IN THE ENGINEERING BRANCH MAINLY ON TRANSMISSION SYSTEMS. HIS WORK INCLUDED BROADBAND TRANSMISSION SYSTEM PERFORMANCE STANDARDS AND THE SPECIFICATION, PROCUREMENT AND INSTALLATION OF A VARIETY OF TRANSMISSION EQUIPMENTS. FROM 1980 HE PARTICIPATED IN THE ANZCAN, SINGAPORE-HONG KONG-TAIWAN AND AUSTRALIA-INDONESIA-SINGAPORE CABLE PROJECTS. RECENTLY HE TRANSFERRED TO THE PLANNING BRANCH WHERE HE IS INVOLVED IN SUBMARINE CABLE PLANNING INCLUDING ARRANGEMENTS FOR INTERCONNECTING EXISTING (ANALOGUE) CABLE SYSTEMS WITH DIGITAL TERRESTRIAL LINES AND TERMINAL EQUIPMENT.
REGARDS.

Edward ROBINSON
Satellite Section
Engineer Class 3

Bachelor of Science (Electrical Engineering);
Master of Engineering Science.

Experience

Since joining the Commission in 1966 experience has been mainly in the areas of planning, installing/commissioning and operating satellite and submarine coaxial cable transmission systems.

Specific areas of responsibility during the past twelve months have included identifying, defining and proposing solutions to the problems associated with the provision of television and business services to customers from urban earth stations. This work involved design and specification of parameters for earth stations including those relating to frequency coordination with radio-relay systems and examining potential customer/OTC interfaces and operating arrangements for a range of possible digital services including video teleconferencing.

OVERSEAS TELECOMMUNICATIONS COMMISSION (AUSTRALIA) (Contd)

Operations Branch

David John YOUNG
Transmission Systems Section
Engineer Class 3 B.E. (ELEC)
UNSW 1968

Experience

Mr Young joined the Overseas Telecommunications Commission (Australia) in 1969 and worked initially in Engineering Branch where he assisted in the installation, planning and commissioning of call data recording facilities for the Gateway Telephone and Telex Exchanges. In late 1971 he transferred to Operations Branch, and worked on inservice modification and day to day running of the offline call statistics data processing.

From 1979, Mr Young has worked in the Transmission Systems area with terrestrial broadband FDM systems, submarine cable systems and analogue bearer data transmission. Currently he is Group Leader of the Special Projects section which encompasses video and audio programme transmission facilities for special occasions. He is the OTC(A) representative on the CMTT National Study Group and the Australian Technical Coordinator for the 1st International Teleconference Symposium.

NAME:	DAVID HARKESS
CLASSIFICATION:	SENIOR ENGINEER (CLASS 111)
SECTION:	DATA FACSIMILE
BRANCH:	OPERATIONS
TELEPHONE:	(02) 230 5859
QUALIFICATIONS:	DIPLOMA OF ELECTRICAL ENGINEERING (1967) SWINBURNE TECHNICAL COLLEGE.

EXPERIENCE:	PRIOR TO JOINING OTC IN 1971 MR HARKESS WAS EMPLOYED WITH THE COMMONWEALTH PATENT OFFICE AS EXAMINER OF PATENTS FOR APPROXIMATELY 2 1/2 YEARS, AFTER WHICH HE SPENT 2 YEARS AT THE NASA DEEP SPACE TRACKING FACILITY AT WOOMARA, S.A. HE HAS WORKED IN BOTH THE ENGINEERING AND OPERATIONS BRANCHES OF OTC IN AREAS CONCERNED WITH ANALOG TRANSMISSION AND MESSAGE SWITCHING, AND HAS RECENTLY MOVED TO DATA AND FACSIMILE AREAS IN OPERATIONS BRANCH.
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OVERSEAS TELECOMMUNICATIONS COMMISSION (AUSTRALIA) (Contd)

Engineering Branch

Noel OXLEY
Transmission Section
Engineer Class 4

Diploma of Electronic Engineering (1976)

Experience

Since graduation, Noel's experience has been wholly within Engineering Branch, in the areas of transmission equipment and satellite earth stations.

The last twelve months has been spent as the head of the transmission section involved in the specification and purchase of analogue transmission equipment, and more recently in the specification of digital transmission equipment. Prior to that he was involved in the earth station section of Aussat Pty. Ltd., (via the National Satellite Division of OTC(A)) for three years. This work involved design and specification of parameters for each stations for a range of applications with the proposed communications satellite.

Kalyami C.G. HAPANGAMA
Telec Section
Engineer Class 2

Diploma in Electrical, Electronic and Control Systems (1976),
Twickenham Technical College (London)

M.Sc, in Control Systems and DIC (1977), University of London.

Experience

Following graduation, two years experience with GEC Telecommunications (U.K.) Ltd working on software and hardware design for System X Local Concentrators.

Since joining OTC in 1978 he has been involved in the following projects.

- . preparation of specifications, tendering and commissioning of data modems and Time Division Multiplexers.
- . development of a High Speed Interface for the Leased Circuit Message Switch (SCMS).
- . Data Gateway tender assessment.

The last two years have been primarily spent on the new Telex Exchange project where his involvement has been as follows :

- . assistance in the specification and design of additional facilities for the exchanges to meet OTC's special requirements;
- . assistance in the performance of installation, acceptance and commissioning tests for the new Telex exchange;
- . liaison with other branches in the Commission on general and specific operational and technical matters.

MONASH UNIVERSITY

DEPARTMENT OF ELECTRICAL ENGINEERING

BASIC DIGITAL TRANSMISSION SYSTEM THEORY

Tutorial Groups, May 28 - June 1, 1984

1
Room G15/6

Kevin Boyle
Barry Chaseling
Robert Harding
Peter Hicks
Graham Jay
Noel Oxley

Alan Li

2
Room G10/6

Tony Czarnota
Paul Fraley
David Harkess
Mark Hayes
Les Ramsay
Ted Robinson
Symon Rozental



3
Room G16/4

Peter Chin
Rob D'Emden
Peter Kent
Alan Miles
Peter Murrell
Peter Wood
David Young

4
Room 105/6

David Gillespie
Dick Flavin
Channa Hapangama
Peter Headford
Colin Mock
Neil Wain

TUTORS

Digital Transmission

1. John Hollow
2. Khee Pang
3. Don Keogh
4. John Millott

Applications

To be allocated

BASIC DIGITAL TRANSMISSION SYSTEM THEORY COURSE - 1985

MONASH UNIVERSITY

20 MAY - 31 MAY

BRIEF PEN PORTRAIT

OF PARTICIPANTS

ENGINEERING DEPARTMENT HEADQUARTERS

BOB CROSS

Engineer Class 2

Long Line & Radio Service Section

Network Operations Branch

Dip. Elec. Eng. 1974 Swinburne College of Technology

HQ Eng. Training - Training Technical Staff
Productivity & Performance - statistics operations
Workforce Structures - staffing/New Technology
Long Line & Radio Service - 2 Mbit/s eqpt.
Service agreements

ANTHONY PAUL de PACE

A/g Engineer Class 3

National Standards & Spectrum
Transmission Planning

Bachelor of Electrical Engineering (Hons) 1978

Monash University

Professional Experience:

1978 - 1980

TELECOM AUSTRALIA - LINES CONSTRUCTION BRANCH

Duties involved the implementation of a computerised cable ordering system, updating of external plant specifications, and design work for external plant equipment related to cable plant.

1980-1982

TELECOM AUSTRALIA - TRANSMISSION NETWORK DESIGN BRANCH

Chief responsibilities included the publishing of an Engineering Instruction dealing with subscriber transmission limits in country areas, as well as transmission design in the subscriber network.

1982 - 1984

BELL NORTHERN RESEARCH (CANADA)

NETWORK PERFORMANCE EVALUATION & RESEARCH SECTION

During my employment with BNR, I was responsible for the development of a Transmission Performance Indicator Plan, whereby objective electrical measurements could be used to derive subjective customer opinion. I was also involved in producing a computer model of the network to be used for voice performance (loudness ratings) analysis.

1985

TELECOM AUSTRALIA - TRANSMISSION PLANNING BRANCH

I am presently working on a discussion paper dealing with Availability Performance, its definition and practical implementation; updating & revising E.I.'s relating to transmission performance objectives, as well as having on going involvement with transmission performance improvement techniques.

IAN JAMES

Classification - Engineer Class 3

Section - Local Design

Branch - Line Transmission Equipment Construction

Completed Bachelor of Electrical Engineering at Monash University in 1980.

BRIEF OUTLINE OF PROFESSIONAL EXPERIENCE

He joined Telecom in Feb 1981 as an Engineer Class 1. His preliminary two-year training was undertaken in Telephone Switching Planning Branch (February-July 1981), Switching Design Branch (August 1981 - January 1982), LTEC Branch (February-June 1982) and the Engineering Department, Victoria (July-December 1982). During this period his main achievements were the preparation of a status paper on the overseas development of network management systems, the preparation of an information paper on the Input/Output Transfer system for ARE 11 exchanges, the investigation of faults on PCM regenerators under high voltage surges, and the evaluation of PCM multiplex equipment. Joined LTEC in January 1983 as Engineer Class 2.

He has a thorough grasp of transmission technology and made a significant contribution to the Branch activities. His main contributions have been in the area of development of interface equipment for the Special Services Network and of specification and evaluation of voice frequency equipments for which LTEC is responsible. Mr James is a good communicator both verbally and in writing; he is a self-motivated competent engineer, well aware of the responsibilities of the position of Engineer Class 3 he currently occupies.

RONG-CHANG HSIEH

Nominal Ees. - Eng. Cl.2

A/g Des - Eng. Cl. 3

Design Optic Section

Lines Construction Branch

<u>Qualification</u>	<u>Year</u>	<u>Institution</u>
B.S.E.E.	1973	Tatung Institute of Technology, Taiwan
M.S.E.E.	1979	University of Colorado at Boulder, USA
M.I.E. (Aust)	1980	The Institute of Engineers, Australia

Details of relevant experience

<u>DESIGNATION/CLASS/GRADE</u>	<u>FROM</u>	<u>TO</u>	<u>LOCATION & MAIN DUTIES</u>
Electronic Engineer	13/10/73	12/8/75	Taiwan, training Navy technicians.
Electronic Engineer	27/8/75	15/8/77	Taiwan, TV circuit design, in Tatung Company.
Graduate Fellowship	16/8/77	18/8/79	USA, Master Degree Course in EE, Uni of Colorado.
Technical Engineer	24/9/79	18/8/82	Olex cables, optical fibre design.
Engineer Class 1	29/11/82	8/6/83	Telecom, LP&P Victoria, APCAMS design.
Engineer Class 2	9/6/83	11/9/83	Cable Design Section,
Engineer Class 3 (A/g)	12/9/83	date	Telecom HQ, optical fibre cable design and testing.

MARTIN PORTER

Nominal Engineer 2/Acting Engineer 3
Spectrum and Design
Radiocommunications Construction Branch
Bachelor of Engineering 1978
Footscray Institute of Technology

Brief Outline of Professional Experience

RMIT Tudor Communication Engineering Department for 1½ years
Radio System Design and Computer Design Software
Telecom Lines Practices and Protection
Telecom Research Labs Time and Frequency

BRUCE ARTHUR WARREN

Class 3 Engineer
Network Facilities Design 1
Switching Design Branch - HQ

Experience has been predominantly in Switching with some experience with AXE equipment.

PAUL NERER

Engineer Class 3
Network Development
Transmission Network Design Branch

Degree in Electrical Engineering - Electronics Components Technology 1965.
This is equivalent to MSC. Obtained at the Slovak Technical University, C.S.S.R.

Involved with cable design and specification (identification equipment, loading coils, gas protectors).

Lines Transmission Theory - analogue, crosstalk on lines, rural subscriber transmission design plan, line conditioning (VFHA, SLE, loading) and radio services etc.

FIANG CHIN

Engineer Class 4 (nominal)
Design Section
Satellite Services Project Team

Bachelor of Engineering, 1965, Master of Engineering, 1967 at University of Canterbury, New Zealand. From July 1967 to July 1982 Mr Chin worked with the Department of Telecommunications, Government of Malaysia. During this employment he worked in a variety of areas including microwave and multiplex maintenance, radio frequency management, television broadcasting maintenance, broadband radio design and planning and development.

Since September 1982, Mr Chin has worked in Telecom Australia. Until October 1983 he worked in Line Transmission Equipment Construction, and since then he has worked in the Broadcasting Directorate. In this latter position he has been concerned with the provision of Television and Sound Broadcasting via Intelsat and AUSSAT satellites.

HOWARD BRIANT

Classification - Engineer Class 4 (A/g E5)

Section - Works Programme

Branch - Line Transmission Equipment Construction

Completed Diploma of Electrical Engineering RMIT 1958

Brief Outline of Professional Experience. Mr Briant commenced with the Commission in Jan 1948 and qualified as an Engineer in 1958. Apart from early State experience Mr Briant's experience has been in the Line Transmission Equipment Construction Branch at Headquarters. At the senior level he has covered all aspects of the Branch operation and management including equipment and systems design, control of Branch finances for the provisioning, monitoring of the equipment supply position and co-ordinating major projects. Mr Briant is competent manager and a technical expert in the transmission equipment field.

PETER DREVENSEK

Engineer Class 2 (nominal)

Planning Section

Satellite Services Project Team

Brief Outline of Professional Experience

Mr Drevensek commenced in November 1979 as a Technical Officer in field Engineering Branch in Victorian Administration. Upon appointment to Engineer 1 he was transferred to Network Services Branch, duties included ARM and 10C trunk exchanges, the Network Automatic Call Distributor (NACK) and Mobile Paging Exchange (MOPAX). He has also worked in the Melb Trunk Transmission Terminal while on rotation and has acted as E2 for 12 months prior to nomination to E2 for Satellite Services Project Team.

RESEARCH DEPARTMENT HEADQUARTERS

TONY BUNDROCK

Engineer Class 4

Radio Satellite and Antenna Technology

Transmission Systems

Research

Bachelor of Engineering (Elec) (Hons)
University of Adelaide, 1968

Brief Outline of Professional Experience

Current

E4(A/g) Satellite Systems, Research
Research into advanced satellite communication systems

1984

E4 (A/g) Satellite Services Project Team
Design of satellite based data networks

1981-1984

E3 Satellite Systems, Research
Research into advanced satellite communication system

1975-1981

E2 Antennas and Propagation Section, Research
Research into technical microwave propagation

1972-1974

Scientific officer, Hirst Research Centre - London
Development of 19 GHz₂ digital radio system.

JOHN HOLLOW

Engineer Class 3

Wideband Systems

Transmission Systems

Research

B. Elec Eng. (1st Hons), Monash University 1971
Ph.D Monash University, 1978 (Thesis: Optimum Estimation and its Simulation
for a Noise - Corrupted Signal)

Brief Outline of Professional Experience

October 1977

October 1979 General Motors - Holden's - Project Engineer, responsible
for electronics design of Noise & Vibration test systems.

October 1979 - October 1982

General Motors Holdens - Senior Project Engineer, responsible for design and development of electronic systems and data acquisition systems, plus technical supervision.

November 1982 - August 1983

Telecom Research, Eng Cl.2, Study of ISDN Passive Bus.

September 1983 - Present - Telecom Research Eng. Cl. 3

investigation of Direct Sequence Spread Spectrum Techniques.

KERRY HINTON

Engineer Class 1

Optical Systems

Transmission Systems

Research

B Sc Adelaide Uni (1977)

B.E. (Hons) Adelaide Uni (1978)

B Sc (Hons) Adelaide Uni (1980)

M Sc Adelaide Uni (1982)

Ph D Newcastle Upon Tyne Uni (1984)

Dip IR Newcastle Upon Tyne Poly (1984)

Brief Outline of Professional Experience

Telecom Research Labs 1984 - E1 -

Quantum modelling of laser diodes for coherent optical communication systems.

STEVE ISKRA

Engineer Class 3

Electromagnetic Compatibility

Transmission Systems

Research

BE (Hons) - University of Melbourne 1981

Brief outline of professional experience

1982 - CA T/TT - Data Protocol (X.25)

1983 - CA/CSF " " (7 weeks acting E2)

1984 - EMC/TT EMI/EMC

MICHAEL FLAHERTY

Engineer Class 3

Voice Services

Customer Services and Systems

Research

B.E (Hons), Ph.D

Professional Experience

1977 - 78

- Telecom, Radio Com Design, Brisbane
- Low capacity radio system design
 - Some digital interface work.

1978 - 82

- Research towards PhD at University of Queensland
- Novel DSP Techniques for speech processing
 - Undergraduate Tutoring

1982 - 84

- South East Queensland Electricity Board - Major Investigations Dept.
- Investigation of System Disturbances using Analytical (+ CAD) & Measurement Techniques
 - Misc. Investigation Work
 - Development of Harmonic Test System using DSP Techniques.
 - Some experience in contract preparation & supervision

1983

- (Part time/evening) Queensland Institute of Technology
Electrical Engineering Department
- Lecturer for 3rd Year Degree course on distributed parameter/transmission line theory.

1984

- Telecom Research Dept; Voice Services Section
- Applications of DSP to Speech Processing

JIM COLVIN

Engineer Class 2

Reference Measurements
Standards and Laboratory Engineering

Research

1970 Diploma Electronic Engineering - Bendigo Institute of Technology
1972 Degree Electrical Engineering - Melbourne University

Professional Experience

On graduation commenced employment with the Guided Media Section in the Research Department. Employed in the "characterization" of millimetre

waveguide and Optical fibre systems as digital transmission medium. The last 6 years have been with Reference Measurement Section. Initially making on phase controlled oscillators. Current work is in the field of digital speech encoding decoding and microprocessor application primarily on a speaking clock system. Work involvement has begun on a digital transmission field experiment.

COMMERCIAL SERVICES DEPARTMENT HEADQUARTERS

MIKE BAIRD

Engineer Class 3

Data Division

Adelaide Uni 1975 - BE (Hons)

From 1979 - Defence Department

From 1984 - DDN Group - TDCC Project

Since September 1979 Mr Baird has been employed by the Department of Defence as a Project Engineer undertaking work in various data communications defence systems. He has obtained a broad engineering experience including the full spectrum of planning, design, installation and operations.

JOHN DOORNBUSCH

Engineer Class 3

Data Division

RMIT 1977 - Ass Dip Eng

From 1974 - LME

From 1984 - DDN Group - TDCC Project

Mr Doornbusch has been employed by LM Ericssons since 1974 as design engineer involved with software and system design for digital, stored programmed controlled (SPC) switching systems. More recently he has been working as software specialist for the AOM project, before joining Telecom in 1983.

MERVYN SEWELL

Principal Engineer Class 4
(A/g Manager Leased Line Marketing C11)

Grad I E Aust
ARMIT (Communications) 1967

Worked as an engineer in telegraph and data terminal areas, transmission network design, PABX, leased lines and customer private networks.

Currently providing engineering support for teleconferencing, megalink and voice/TV/broadcast leased lines.

MALCOLM KEELER

STEPHEN FORD

Engineer Cl. 3

Trunk Grid 1 System Design

Trunk Network Engineering Region

02 923 8363

PO Box 1404 - North Sydney 2060

BSC (Eng) U NSW 1975

Transmission Network Planning and Design

Specification of Transmission Eqpt Installation Works

Bearer Utilisation Planning and Programming

YUSUF JAYAR

Engineer Cl. 2

Line Transmission Support

Trunk Equipment Branch - Network Management Region

02 230 6817

5th Floor, 309 Kent St, Sydney 2000

B.E. UNSW 1980: One year post grad studies in Digital Comms Transmission Planning, AXE Network Optimisation, Design and Maintenance of FDM, TDM Equipment.

GRAHAM ROBSON

Acting Engineer Cl.2

Design Branch, LNE(M) Region

02 217 2759

8th Floor,

Elizabeth Towers

96 Devonshire Street

Surry Hills 2010

BE NSWit 1983

Installation of 2 MBPS Systems on Cable and Radio

6560-100

MOUNIR HASROUNI

Acting Engineer Cl.3

High Capacity Cellular Mobile Telephone Services
(HCCMTS) Project

Trunk Network Engineering Region
02 217 2571 or 2550
4th Floor Elizabeth Towers
96 Devonshire Street
Surry Hills 2010

BE (Elect) NSWIT 1980

Project Engineer for 'Single Channel and Analogue Group Radio Concentrator System' in 80-81, Design of 60 CH Radio System 81-82, Radio Paging and MTS Project 81-85,

Analogue and Digital Radio Broadband Systems 81-85.

BRUCE JAMES PARKINSON

Customer Networks & Equipment Section

B.E. (Elec) Hons - 1974 University of QLD
 - 1979 University of QLD

1975	M.Eng.Sc	-	full time study
1976	Eng. 1	-	Projects
1977 - 1979	A/Eng. 2	-	Switching & Transmission
1980	Eng. 2	-	Datel
1981 - 1983	Eng. 2	-	Telegraphs & Telex
1984 - Present	Eng. 3	-	Data Switching (Packet Switching, Videotex, EFT)

Radiocom Operations

Radiocom Network Engineering
Telecom Australia
4th Floor, 360 Queen Street
BRISBANE 4000

During the last two years he has been involved with automated video switching equipment and digital radio trials. He has also been working on data above voice (DAV) trials and monitoring bearer performance.

ENGINEERING DEPARTMENT - TASMANIA

GARRY JOHNSTON

Engineer Cl. 2 Radio
A/g Engineer Cl.3 Digital Radio Projects

Network Performance & Radio
002 208 684
3rd Floor
47 Liverpool St.
HOBART 7000

1978 - TAS College of Advanced Education

Experience Since 5/78

Eng. Cl.1	Exchange Installation	1 year
Eng. Cl.2	Network Performance	1 year
Eng. Cl.2	Customer Networks & Equip	1½ years
Eng Cl.2	Radio	2½ "
A/g. Eng. Cl.3	Network Performance	3/4 "
A/g. Eng. Cl.3	Digital Radio Projects	(Present Position)

Last 2 years experience mainly involved the preparation of installation and test specifications for broadband radio projects together with other duties typical of a project engineer. This period also included 8 months acting Senior Engineer Network Performance. The duties of this position are concerned with setting and monitoring performance standards for all aspects of telephone network, reporting on and initiating corrective action on aspects which are not meeting those standards.

MONASH UNIVERSITY
DEPARTMENT OF ELECTRICAL ENGINEERING

and

TELECOM AUSTRALIA

BASIC DIGITAL TRANSMISSION SYSTEM THEORY

Timetable for May 25-29, 1987.

	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY
9.00	DIGITAL TRANSMISSION 1.	DIGITAL TRANSMISSION 5.	DIGITAL TRANSMISSION 8.	TRANSMISSION TECHNIQUES FOR ISDN 1.	OPTICAL FIBRE SYSTEMS 1.
10.00					
10.15					
11.15	DIGITAL TRANSMISSION 2.	TUTORIAL	TUTORIAL	TRANSMISSION TECHNIQUES FOR ISDN 2.	OPTICAL FIBRE SYSTEMS 2.
12.15	TUTORIAL	DIGITAL TRANSMISSION 6.	DIGITAL TRANSMISSION 9.	TUTORIAL	TUTORIAL
1.15					
2.15	DIGITAL TRANSMISSION 3.	TUTORIAL	TUTORIAL	DIGITAL RADIO	LUNCH
3.15	DIGITAL TRANSMISSION 4.	DIGITAL TRANSMISSION 7.	TUTORIAL		
3.30					
5.00	TUTORIAL	TUTORIAL	TUTORIAL	TUTORIAL	COURSE EVALUATION