

CHECK LIST OF USAGE AND MAINTENANCE OF PROVIDED EQUIPMENT

No	NAME OF EQUIPMENT	QUANTITY	MAKER	LOCATION	USAGE (Always / sometimes)	Condition (Good/Lead)	Problems and way to Resolution	Installation Year.
425	Memory Scope (50MHZ)	1	IWATSU	LAB.	Frequently	Good	Low Speed. We need 100 MHZ Oscilloscope Preferably IWATSU SS-7611 MODEL	19 81
426	Regulated D.C Power Supply	2	KOKUSUI	"	"	"	No problem	19 81
427	D.C. Power Supply	1	METRONICS	"	"	"	"	19 80
428	Digital Multimeter	1	TAKEDA	"	"	"	"	19 81
429	Frequency Counter	1	ANDO	"	"	"	"	19 80
430	Decade Attenuator	2	ANDO	"	Not used	"	"	19 79
431	Squeezing Tool	1	JICA	"	"	"	"	19 79
432	Roller SQ Tool	2	"	"	"	"	"	19 79
433	U/G Cable Cutter	1	"	"	Sometime	"	"	19 79
434	Amplifier TA-15B	1	"	"	Not used	"	"	19 79
435	Amplifier TA-3	1	"	"	"	"	"	19 79
436	Standard Resister	1	"	"	"	"	"	19 79
437	Cable Pair Tester	1	"	"	"	"	"	19 79
438	PH. Meter Glass Electrode	1	"	"	"	"	"	19 79
439	Earth Tester	1	"	"	Some Times	"	"	19 79
440	Pinhole Detector	1	"	"	"	"	"	19 79
441	Detector Probe	1	"	"	"	"	"	19 79
442	Sliding Rheostat	1	"	"	"	"	"	19 79

CHECK LIST OF USAGE AND MAINTENANCE OF PROVIDED EQUIPMENT

No	NAME OF EQUIPMENT	QUANTITY	MAKER	LOCATION	USAGE (days / sometimes)	Condition (Good/bad)	Problems and way to Resolution	Installation Year.
443	Automatic Cable Splicing Machine	1	JICA	LAB.	Sometimes	Good	No problem	1979
444	Pair Cable Fault Locator	1	"	"	"	"	"	1979
445	Mano Meter	4	"	"	Not Used	"	"	1979
446	Portable Line Fault Locator	1	"	"	Sometimes	"	"	1979
447	Selemo (Loading Balancing Meter) MS-13A	1	"	"	"	"	"	1979
448	Selemo 23-A	1	"	"	Not Used	"	"	1979
449	Matching Transformers	28	"	"	Sometimes	"	"	1979
450	Insulation Resistance with P.S. Unit Tester	one set	YOKOGAWA	"	"	"	"	1979
451	Noise Meter	1	ANDO	"	"	"	"	1979
452	Crosstalk Measuring Set	2	"	"	"	"	"	1979
453	Dual Tracking DC Power Supply	2	ANRITSU	"	"	"	"	1979
454	Fault Locator	1	TSUKEN	"	"	"	"	1979
455	Fault Locator Power Supply	1	"	"	"	"	"	1979
456	Ultra Megohm Meter	1	TOA Elect.	"	"	"	"	1979
457	Frequency Counter	1	AURICON ELECT.	"	"	"	"	1979
458	Electronic Poly-Recorder	3	TOA ELECT	"	"	"	"	1979
459	Portable Air Dayer with Tool	1	JICA	"	"	"	"	1979
460	Oscillator	2	ANDO	"	"	"	"	1979
461	Search Signal Oscillator	1	"	"	"	"	"	1979

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NO	NAME OF EQUIPMENT	QUANTITY	MAKER	LOCATION	USAGE (always / sometimes)	Condition (Good/bad)	Problems and way to Resolution	Installation Year.
462	Return Loss Measuring Set	1	ANDO	LAB.	Not Used	Good	No problem	1979
463	Capacitance Bridge	1	"	"	"	"	"	1979
464	Level Meter	1	"	"	Sometime	"	"	1979
465	Direct Reading Impedance Bridge	1	"	"	"	"	"	1979
466	Specific Earth Resistance Tester	1	JICA	"	"	"	"	1979
467	Portable Pressure Guage	4	KAKUMARO SEIKICO	"	Not used	"	"	1979
468	Line Finder Receiver Unit	1	ANDO	"	Sometimes	"	"	1979
469	Line Finder Transmitter Unit	1	"	"	"	"	"	1979
470	Switching Unit	2	"	"	Not used	"	"	1979
471	Electrostatic Coupling Measuring Set.	1	"	"	"	"	"	1979
472	External Shunts	3	JICA	"	Sometimes	"	"	1979
473	External Shunts 50A	3	"	"	"	"	"	1979
474	External Shunts 500A	3	"	"	"	"	"	1979
475	DC Volt Meter	3	YEW	"	"	"	"	1979
476	DC Amperemeter	3	"	"	"	"	"	1979
477	DC M/V Meter	3	"	"	"	"	"	1979
478	Line Fault Locator	1	ANDO	"	"	"	"	1979
479	Search Coil for U/G Depth.	1	JIC	"	Not used	"	"	1979
480	SD Wire Trouble Search Antenna	1	JIC	"	Sometimes	"	"	1979

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NO	NAME OF EQUIPMENT	QUANTITY	MAKER	LOCATION	USAGE (always / sometimes)	Condition (Good/Bad)	Problems and way to Resolution	Installation Year.
481	Impedance Bridge	1	ANDO	LAB.	Sometimes	Good	No problem	11 83
482	Earth Resistance Meter	1	"	"	"	"	"	19 83
483	Handy Insulation Tester	1	Yokogawa	"	Not used	"	"	19 83
484	Electronic Recorder	1	RIKADENKI	"	"	"	"	19 83
485	Electronic Calculator	1	SHARP	"	Sometimes	"	"	19 83
486	Touch Dial	1	NEC	"	"	"	"	19 83
487	Voltage Slider 1KVA	1	SHIBAURA	"	"	"	"	19 83
488	Earth Tester 3235	1	YEW	"	Always	"	"	19 83
489	Earth Tester type 3235	1	YEW	"	"	"	"	19 83
490	Vacume Tube Voltmeter	1	KIKUSUI	"	Not used	"	"	19 83
491	A.C/2000 Recopy	1	RICOH CO	"	Normal	Bad	Tube covering broken	1979
492	A.B. Dick (Offset printing) Model 350 Machine	1	A.B. Dick	"	"	Bad	1) Motor Inking system not working. 2) Amonia Bottle Broken 3) Speed control not operating.	19
493	U-BIX Plain paper copier				Always	Good	No problem	19
494	Microfilm Reader Canon	1	Japan	"	NIL	Good	"	19
495	Microfilm Camera Canon	1	Japan	"	NIL	Good	"	19
496	Overhead Projector	1	Japan	"	Sometimes	Good	"	19

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NO	NAME OF EQUIPMENT	QUANTITY	MAKER	LOCATION	USAGE (Always / Sometimes)	Condition (Good/Bad)	Problems and way to Resolution	Installation Year.
497	Slide Projector	1	Japan	Lab.	Sometimes	Good	No problem	18
498	Reader printer Minolta							19
499	Model RP-405	1	Japan	"	Nil	"	"	19
500	FUJICS ML-1000	1	"	"	"	"	"	19
501	Multi Channel switch 2815.	1	YEW	"	Sometimes.	"	"	15
502	Electronic Exchange ND-20					BAD	RELAY Controller	19
	Comprising of						faulty, spare package Not	14
	a. Line & Trunk Equipment						available (P-7M42)	16
	b. Speech Path Equipment & Centerel Equipment.	ONE SYSTEM					More one certridge	18
	c Central processor	ONE SYSTEM		LABORATORY			Magnetic (KENNEDY)	18
	d. Supervisory D Test EQPT.				SOMETIM		Med 330 faulty.	19
	e. Tele-Typewriters							14
	f. Magnetic Tape Equipment.							19
	g. Line printer.							19
	h. Ringer (SANYO)							19
	j. 2 KVA Transformers (Yamubishi)							19
503	Transister Curetracer TCT-7D	1	KUKUYO	Lab.	Sometime	Good		19 79
504	Synchroscope (SS-5100)	1	IWATSU	"	"	"		19 79
505	Oscilloscope (V-302)	1	HITACHI	"	"	"		19 80

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No	NAME OF EQUIPMENT	QUANTITY	MAKER	LOCATION	USAGE (Always/Sometimes)	Condition (Good/Bad)	Problems and way to Resolution	Installation Year.
506	Stared Program Remote Controlled Line Concentrator	1	NEC	LAB.	Sometimes	Good	No problem	1979
507	Electromagnetic Oscillograph Type 290]	1	Kokogame	"	"	"	"	1979
508	Wave Analyzer (Mod. 358A)	1	H.P.	"	"	"	"	1979
509	Multimention Meter Mod 427A	1	"	"	"	"	"	1979
510	Impulse Sender (TSD-3)]	1	ANDO	"	"	"	"	1979
511	Fault Locator (POL-W)	1	"	"	"	"	"	1980
512	RCM Programmer TR 4928	1	T/R	"	"	"	"	1981
513	Logic Analyzer (TR 4720)	1	T/R	"	"	"	"	1981
514	Micro Processor Lab. (5036A)	2	H.P.	"	"	"	"	1981
515	Micro Computer Kit CMP-80	1	TUKANO	"	"	"	"	1980
			DANSHI	"	"	"	"	1980
516	Electronic PABX KC-050E with Power Supply Unit & Maintenance console	1+]	OKI	"	Always	"	"	1983
517	Computer with monitor IF-800	1	"	"	Sometimes	"	"	1983
518	Regulated DC Power Supply 6455A	2	METRONIX	"	"	"	"	1979

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519	Regulated DC Power supply	1	METRONIX	LAB.	Sometimes	Good	No problem	1981
520	Regulated DC Power supply	2	"	"	"	"	"	1981
								19
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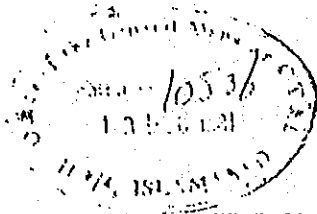








資料4 Research Boardの構成メンバー



PAKISTAN TELEGRAPH & TELEPHONE DEPARTMENT  
OFFICE OF THE DIRECTOR-GENERAL

NO.E:21-2/81 Dated at Islamabad the 7th December, 1981

SUBJECT: TELECOMMUNICATION RESEARCH AND DEVELOPMENT BOARD.

In continuation of the Memo.NO.DT.30-1/64 dated 31st August, 1970 on the subject noted above the Director-General T&T is pleased to reconstitute the Telecommunication Research and Development Board as under:-

- |  |                  |
|--|------------------|
| 1. Director-General,<br>T&T, Islamabad           | CHAIRMAN         |
| 2. Government Inspector<br>Telegraph & Telephone | MEMBER           |
| 3. Chief Engineer (H&O)                          | MEMBER           |
| 4. Chief Engineer (RFV)                          | MEMBER           |
| 5. Chief Engineer (PIG)                          | MEMBER           |
| 6. General Manager,<br>CIRL Islamabad.           | SECRETARY/MEMBER |
| 7. Managing Director, CII                        | MEMBER           |
| 8. Managing Director, IIP                        | MEMBER           |

2. The Board shall decide the policy for all research and development activities in the research organizations of the T&T Department.

3. It shall meet atleast once in three months.

4. Three members, besides the Chairman, shall be the quorum at any meeting, for taking valid decisions.

5. The Managing Directors of CII and IIP shall place before the Board all such items, parts, components, modules, system/equipment etc. etc. on which research is required to be conducted in order to make the country less and less dependent on foreign supplies and patents. They will coordinate all their product development activities with those of the T&T's research organizations.

6. The Secretary shall issue proceedings of the Board every three months, soon after every meeting of the Board.

( EIAN MUNAWARHIDDIN )  
DIRECTOR-GENERAL, T&T.

P.T.O.



資料5 CTRLの将来計画

Provisional details of the projects to be undertaken in C.T.R.L. and related equipment required in next five years under grant aid phase-II from JICA.

PROPOSED PROJECTS TO BE UNDERTAKEN DURING  
NEXT 5 YEARS IN C.T.R.L. AGAINST GRANT AID PHASE II  
FROM JICA.

CARRIER/PCM DIVISION:

- | <u>S.NO.</u> | <u>NAME OF PROJECT</u>   |
|--------------|--|
| 01.          | Study & Development of lower order optic fiber transmission system 8/34 M/bits.  |
| 02.          | Study & Development of Digital Multiplex equipment, bridging the various level of the 2048 K/bits based digital hierarchy. |

CIRCUIT COMPONENT DIVISION.

- |     |  |
|-----|--|
| 03. | Strengthening of P.C.B facilities to cater the needs of all the labs in C.T.R.L. |
|-----|--|

WORKSHOP:

- |     |   |
|-----|---|
| 04. | Strengthening of workshop facilities to cater the needs of all the labs in C.T.R.L. |
|-----|---|

ELECTRONICS/ELECTRICAL POWER SUPPLY LAB.

- |     |   |
|-----|---|
| 05. | Development of a Switchmode Rectifier Unit. |
|-----|---|

COMPUTER/SOFTWARE DIVISION.

- |     |   |
|-----|---|
| 06. | Detailed study of IBM Mini Computer RISC SYSTEM/6000, Power Server 930.   |
| 07. | Development of Software Programmes for Different Laboratories of C.T.R.L. |

DATA LAB.

- |     |   |
|-----|---|
| 08. | Study & Development of 9.6K BPS Data Modem. |
| 09. | Study & Development of Data Network.        |

V.H.F. DIVISION.

- |     |  |
|-----|--|
| 10. | Development of SYNTHESIZED VHF RADIO TELEPHONE SYSTEM. |
|-----|--|

MICROWAVE DIVISION.

- |     |  |
|-----|--|
| 11. | High Power Amplifier.                      |
| 12. | Low power Amplifier or Pre-Amplifier (LNA) |
| 13. | Up Converter.                              |
| 14. | Down Converter.                            |

Contd on P/2

S.NO.      NAME OF PROJECT.

- 15.      Oscillator.
- 16.      Filters.
- 17.      Isolator/Circulator.
- 18.      Duplexer.
- 19.      Antenna.

CONVENTIONAL TELEPHONE DIVISION:

- 20.      Design & Development of computerized local call simulator with print-out facility.
- 21.      Modification in E.M.D system to safeguard against excessive metering in case of ground on junction lines.
- 22.      Design of modification in E.M.D trolley to safeguard against putting through of free calls.
- 23.      Design and Development of computerized Tester for 3-wire junction circuits.
- 24.      Design and Development of computerized junction Repeater Tester.
- 25.      Design and Development of Auto Test Trolley for E.M.D switches.
- 26.      Design and Development of junction call simulator.
- 27.      Design and Development of obnoxious call holding equipment.
- 28.      Design and Development of electronic junction Repeater.
- 29.      Design & Development of long distance cion box.
- 30.      Design & Development of busy/removed switches in different stages with print out for E M.D exchanges.

DOCUMENTATION CELL.

- 31.      Establishment of Printing facilities.
- 32.      Strengthening of duplicating and documentation facilities.

LIST OF EQUIPMENT REQUIRED DURING 5 YEARS IN CTRL.  
ON THE PROPOSED PROJECTS AGAINST GRANT AID.  
PHASE II FROM JICA

Division: Circuit Component Lab:

<u>S.NO.</u>	<u>Name of Equipment</u>	<u>Qty.</u>	<u>Unit Price</u> <u>in US \$</u>	<u>Cost in US \$</u>
--------------	--------------------------	-------------	--------------------------------------	----------------------

- |    |   |  |  |  |
|----|---|--|--|--|
| 1. | C.N.C. Single spindle drilling and routing machine. |  |  |  |
| 2. | Ceramic subscrible lazer scriber.                   |  |  |  |
| 3. | Wave soldering machine                              |  |  |  |

WORKSHOP:

- |    |  |   |  |  |
|----|--|---|--|--|
| 4. | CNC spark Erosion Machine with 30 multiform & counter control with attachments | 1 |  |  |
| 5. | Universal tool & cutter grinder with digital display.                          | 1 |  |  |
| 6. | Small lathe machine  | 1 |  |  |
| 7. | Fork Lifter  | 1 |  |  |

ELECTRONICS/ELECTRICAL POWER SUPPLY LAB.

- |    |   |  |  |  |
|----|---|--|--|--|
| 8. | Related equipment & a kit for switchmode Rectifier. |  |  |  |
|----|---|--|--|--|

CARRIER/PCM LAB:

- |     |                                     |   |  |  |
|-----|-------------------------------------|---|--|--|
| 9.  | Primary Multiplex Analyzer HP 3779C | 1 |  |  |
| 10. | P.C.M. Terminal Test Set HP 3776A   | 1 |  |  |
| 11. | Optic Fibre Cable 8 Fibres          | 1 |  |  |

COMPUTER/SOFTWARE LAB:

- |     |  |   |  |  |
|-----|--|---|--|--|
| 12. | IBM RISC SYSTEM/6000 POWER SERVER 930  | 1 |  |  |
| 13. | IBM RISC SYSTEM/6000 POWER STATION 320 | 1 |  |  |

DATA COMMUNICATION LAB.

- |     |  |   |  |  |
|-----|--|---|--|--|
| 14. | Local Area Network/Wide Area Network Protocole Analyser. | 1 |  |  |
| 15. | Bit Error rate test Set.                                 | 1 |  |  |
| 16. | Signalling Test Set.                                     | 1 |  |  |
| 17. | Transmission Impairment Test Set.                        | 1 |  |  |
| 18. | Break out Box (Tester).                                  | 1 |  |  |
| 19. | Data Scope   | 1 |  |  |
| 20. | Modem Tester   | 1 |  |  |

Contd.on page/



<u>S.NO.</u>	<u>Name of Equipment</u>	<u>Qty.</u>	<u>Unit price in US\$</u>	<u>Cost in US\$</u>
<u>OUTSIDE PLANT LAB:</u>				
21.	Split propagation test oven with Electronic regulator Air circulator	1		
22.	Bursting Strength test Tensile Tester Load cell (50 kg)	1		
23.	Water tightness test equipment Intox water bath (2.5 meter)	1		
24.	Bridge Megger tester	1		
25.	Environ-mental cycling test Type Grenco Air cooling	1		
26.	Fault locator Micro Processor controlled digital fault locator operating pulse echo principal	1		
27.	Pair cable fault locator Model MW 32 D INRITSU (Japan)	1		
28.	Pulse Echo Tester MW 43D INRITSU (Japan)	1		
<u>MICROWAVE LAB:</u>				
29.	High Power Amplifier 1 GHZ to 20 GHZ 0.5 Watt to 10 Watt	1		
30.	Low Power Amplifier or Pre-Amplifier (INA) 1GHZ to 20GHZ	1		
31.	UP Converter 1GHZ to 20 GHZ	1		
32.	Down Converter 1GHZ to 20GHZ	1		
33.	Oscillator 1GHZ to 20 GHZ	1		
34.	Filters 1 GHZ to 20GHz	1		
35.	ISOLATOR/CIRCULATOR 20 MHz to 30GHz	1		
36.	DUPLEXER 200 MHz to 30GHz	1		
37.	Antenna 1GHz to 30 GHz			
38.	Synthesized Sweeper 10MHz to 110GHz	1		
39.	Vector Signal G/R 0.01 to 18GHz	1		
40.	Pulsed-RF 2 to 20 GHZ Network Analyzer System.	1		
41.	Logic Analyzer 2 to 20 GHz	1		
42.	PCM Digital Signal Generator	1		
43.	Error Rate Measuring Equipment 1 K bit/sec to 100 M bit/sec			

44. Codec Characteristic Measuring Equipment 1

VHF LABORATORY:

45. Tranceiver Test Set (One Compact Unit) 1

TELEGRAPH LABORATORY:

46. Precision Digital ICR Meter 1

47. Memory Scope 1

48. Artificial Transmission Line 1

49. Measuring Bridge for Low Impedance 1

50. X-Y Recorder 1

51. L.F. Impedance Analyzer 1

52. Slective Level Meter 1

53. Document Fax (Group III), 2 Terminals 1

54. Document Fax (Group IV), 2 Terminals 1

55. Tel. Tex. 2 Terminals 1

56. Video Tex, 2 Terminals 1

57. Soldering desoldering station 1

58. UPS (Unit interrupted Power Supply) 230 V/500 Watt. 1

59. Digital Multimeter 1

60. Variable Power Supply 30V/12AMP  
60V/12 AMP  
30V/3 AMP 2 each

CONVENTIONAL TELEPHONE DIVISION:

61. Selective Level meter 1

62. Soldering/Desoldering Station 1

63. Memory Scope 1

64. Programable digital IC test system 1

65. Transister Tester 1

66. Avometer 3

67. Components assorted

PRINTING FACILITIES:

68. Off set colour printing machine 1

69. Applicater plate maker 1

70. Book Binding machine 1

71. Staple machine large size 1

DRAWING & DUPLICATING FACILITIES:

72. Heavy duty colour photo copier 1

73. Electronic typewriter full size 1

74. Cyclostyling machine 1

75. Camera CANON 1

76. Drawing material assorted 1

PROVISIONING OF EXPERTS FOR C.T.R.L.  
AGAINST GRANT AID PHASE<sup>II</sup> FROM JICA.

<u>S.NO.</u>	<u>NAME OF DIVISION</u>	<u>NO.OF EXPERT</u>	<u>FIELD</u>	<u>DURATION</u>
01.	Conventional Telephone Division.	One	Switching/Software expert.	1 year.
02.	Telegraph.	One	Electronic Telex machine, Video Tex, Telex Tex.	1 year.
	do	One	P.C and Fax equipment group III & IV.	1 year.
03.	V.H.F.	One	Synthesized VHF Radio Telephone System.	2 years.
04.	Data Lab.	One	Data Communication.	1 year.
05.	Computer/S/Ware Lab.	One	Computer Hardware.	1 year.
06.	Electronics/Electrical Power Supply Lab.	One	Switchmode Technology.	1 year.
07.	Workshop.	One	CNC Machine.	1 year.
08.	Circuit Component Lab.	One	Through Hole Technology.	3 Months.
09.	Carrier/PCM Division.	One	Digital Communication.	2 years.
10.	Software Development	One	Software Development	3 years.

TRAINING REQUIREMENT OF OFFICERS/OFFICIALS  
OF C.T.R.L. DURING NEXT 5 YEARS AGAINST  
GRANT AID PHASE II FROM JICA.

Director/D Es	17	All fields minimum duration 6 months.
A.D.Es/A.E.	24	
E.S's.	20	

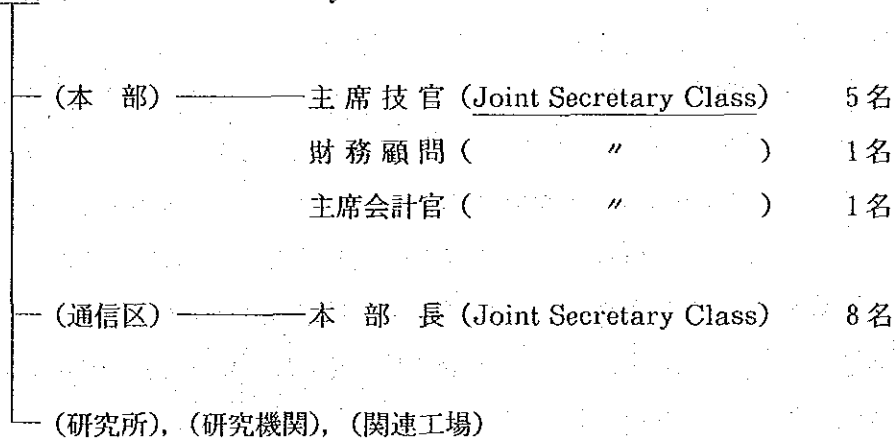
資料6 T & T (現電気通信公社(PTC)) の概要

1 概要

- 当国の電気通信業務は、通信省電信電話庁(Telegraph & Telephone Department)が国内及び国際通信を提供している。
- 電話機設置台数は82.5万台(90年)であり、100人当たり0.71台にすぎない。
- 一方、75万台(90年)の積滞がある。
- 通話品質は、混信、中断、誤接続が頻繁に発生する等問題が多い。
- しかし、財政事情から、第7次5ヵ年計画中の総投資額について変更が迫られている現状にある。

2 組織

- 総裁 (Additional Secretary Class)



- 電話局数 446局
- 職員数 44,690名

3 予算

単位 Rs・百万

		88/89	89/90	90/91
収入	政府支出	2,562	2,850	2,967
	電話等収入 (うち、国際通話)	8,018 (2,370)	9,195 (2,842)	11,763 (3,000)
	計	10,580	12,045	14,730
支出	開発予算	4,035	3,771	3,840
	その他支出	994	1,496	1,774
	計	5,029	5,267	5,614
純益		5,551	6,778	9,116

注) ・政府支出、電話等収入、開発予算、純益はそれぞれ予算書に掲載される。しかし、最終確定の数字ではない。(最終値は不明)  
 ・その他支出は単に計算により導いた数字。

#### 4 第7次5ヶ年計画

- 計画総額は、556億ルピーである。各ターゲットは以下のとおり。

	88.6.30現在 (87年度末)	6次5ヶ年計画の 積み残し(A)	7次5ヶ年計画 (B)
市内回線(回線数) (市内回線, 交換機の端子)	737,000	204,000	1,318,000
市内回線(改修・回線数)	-	-	138,000
公衆電話設置所(数)	2,917	125	8,000
長距離回線(回線数)	13,757	2,000	70,000
電話交換機(台数)	1,176	206	950
テレックス(回線数)	8,000	8,000	5,400
ファクシミリ(回線数)	450	-	5,000

- しかし、ガルフ危機等に基づいて財政事情の悪化が生じている。

#### 5 日本・パキスタン政府ベースの協力

##### (1) 無償資金協力

- イスラマバード中央電気通信研究所(C'TRL)

・E/N 77.1.25 10億円, 77.7.30 12億円

・日パ無償資金協力の第1号, プロジェクト方式技術協力も併せて実施。

・日本は、ハリプールの訓練センターに技術協力を実施していたが、同センターが研究所に昇格, イスラマバードに移転した。

##### (2) 有償資金協力

E/N締結日	案 件 名	金額(億円)	備 考
77. 4. 5	電子交換機増設	19.00	ラホール, NEC・住友
82. 8. 31	イスラマバード衛星地上局建設 及び国際交換機増設	48.40	NEC・住友
82. 8. 31	マイクロウェーブ網増設	32.00	カラチ・ラホール・イスラマ, NEC・住友
87. 7. 5	テレックス回線増設	19.00	全国12ヶ所 NEC・住友
90. 8. 7	電気通信網拡充	208.55	海部首相訪パの際プレッジ。 近くL/A締結の予定。
	(内容)		
	光伝送路建設		ピンディ〜ペシャワール, サッカール〜クウェッタ
	小容量無線伝送路整備		全国各地のVHF網
	衛星地上局増設		カラチ, イスラマの地上局通信設備の増設
	国際交換局増設		イスラマバード
	海事通信拡充		カラチの海岸局の更新

##### (3) 技術協力

- 平成2年度までに234名の研修員を受け入れ, また, 104名の専門家を派遣している。

(放送分野を含む)

6 既存設備 (数字は88年6月30日現在)

(1) 国内通信

① 電話交換機

- 手動式 899台, 自動式 277台の計1,176台となっている。自動式は, ステップ・バイ・ステップと電子交換機である。(クロスバーはない。)

● 市内交換機

- ・ 回線数は73万7,000回線, うち, 67万7,000回線は, 自動交換機。
- ・ 電子交換機は, イスラマバード, ラワルピンディ, カラチ, ラホール, ペシャワール, ファイサラバード, ハイデラバード, クウェッタに設置されている。

(内訳)	シーメンス	(デジタル)	11.00万回線	} 計 26.35万回線
	エリクソン	( " )	7.80万回線	
	アルカテル	( " )	6.95万回線	
	NEC	(アナログ)	0.60万回線	

● 市外交換機

- ・ 全てシーメンス製 (ステップ・バイ・ステップ及び電子交換機)

② テレックス交換機

- 回線数 7,970
- 機種
 

カラチ, イスラマバード	NECデジタル交換機
ラホール	プレッシィ (英), デジタル交換機
その他	シーメンス製旧式交換機

- なお, 新たに, カラチ, ファイサラバード, ペシャワール等12都市にNECデジタル交換機が導入される。

③ 伝送設備

- メインルートは, マイクロ無線 (アナログ) 及び同軸ケーブルにより構成されている。

- ・ マイクロ
  - ・ 総延長 6,445km
  - ・ ほとんどNEC, 一部東芝, 富士通, ITALTEL
- ・ 同軸ケーブル
  - ・ 総延長 2,538km
  - ・ ほとんどNEC, 一部シーメンス
- ・ 光ケーブル
  - ・ 1989.10 カラチ・ラワルピンディ間をオーストラリアが受注。
  - ・ 現在建設中。(ADBによる)

- ルーラルエリアはドムサット, VHF, UHF等多様なシステムが利用されている。





- 従業員 約3,500名
  - 製造機器 EMD交換機, 電話機, タイプライター等, 近年デジタル電子交換機の製造を開始している。国産化率 約50%。
- (3) CTI (Carrier Telephone Industries)
- 設立 1969年, イスラマバード
  - 資本 資本金7,800万ルピー, シーメンスが47%出資, 残りはT/T
  - 従業員 約350名
  - 製造機器 同軸及びマイクロ波多重交換装置, 搬送端局等。国産化率は約30%。
- (4) NRTC (National Radio Telephone Corporation)
- 設立 1965年, ハリプール(当初NECの技協で設立, しかし, 以後, 米, 加からの技術導入がなされ, 同社との関係はなくなっている。)
  - 資本 資本金3,500万ルピー, 通信省と防衛省が50%ずつ出資。
  - 従業員 約600名
  - 製造機器 PBX電源。
- (5) アルカテルが電子交換機の工場の建設につきバ政府と契約を結んでいる。

## 8 新しい動き

### (1) 民営化

#### ① 経緯

- 運営の非効率を理由に, かなり古い時期から民営化が言われており, 89年9月にも「CORPORATION」化する旨の閣議決定がなされている。
- 90年12月3日 再度「CORPORATION」化する旨の閣議決定がなされた。
- 90年12月15日 大統領令第16号により「CORPORATION」化された。

#### ② 大統領令第16号

- 新会社の目的 通信網の設置, 拡充, 維持・管理に加え, 通信機器の製造も, 目的の1つとなっている。
- 経営 政府によって指命される会長(chairman)と11名以下の取締役(directors)で構成される取締役会によって行なわれる。
- 資本金 300億ルピー (額面10ルピーを30億株)
- 従業員 雇用条件は現状どおり, 全員新会社に引き継がれる。

#### ③ 現状

現在, 通信省次官をActing Chairman, 通信省上級次官補, 次官補, 通信社の主席技官等をメンバーとする臨時取締役会が構成されており, 1991年1月14日に第1

回会合が催された。

(2) 自動車電話

① 入札

- 90年1月21日 入札を実施。12社が参加している。
- PAKTEL及びPAKCOMの2社へライセンスが与えられた。

②

会社名	PAKTEL		PAKCOM	
投資コスト	1,700万ドル		1,700万ドル	
資本構成	HASSONグループ	60%	ARFEEN	51%
	C & W	40%	CONVIK (スウェーデン)	} 49%
			MILLICOM (アメリカ)	
本体 端末	エリクソン製 テクノホン/松下製		エリクソン製 モトローラ製	

③ 現状等

- PAKTELが先行しており、11月カラチでサービスを開始した。引き続き、12月ラホール、1月イスラマバードに対象地域を拡大した。
- 第1ステージとして、各地域3,000回線を想定している。
- PAKCOMは新聞公告は出しているが、営業は開始していない。

(3) BOT BLT

- PTCは、資金不足を補うため、BOT (built operation and transfer)または、BLT (built leasing and transfer)の活用を考えている。

## 1. T/Tの収入の伸び

(単位, 100万ルピー)

	85/86	86/87	87/88	88/89	89/90
電話収入 (前年比)	4,563 (+15%)	5,515 (+21%)	6,650 (+21%)	8,018 (+21%)	9,195 (+15%)
国内電話収入 (前年比)	3,454 (+16%)	4,245 (+23%)	4,660 (+10%)	5,648 (+21%)	6,353 (+12%)
国際電話収入 (前年比)	1,109 (+14%)	1,270 (+15%)	1,990 (+57%)	2,370 (+19%)	2,842 (+20%)

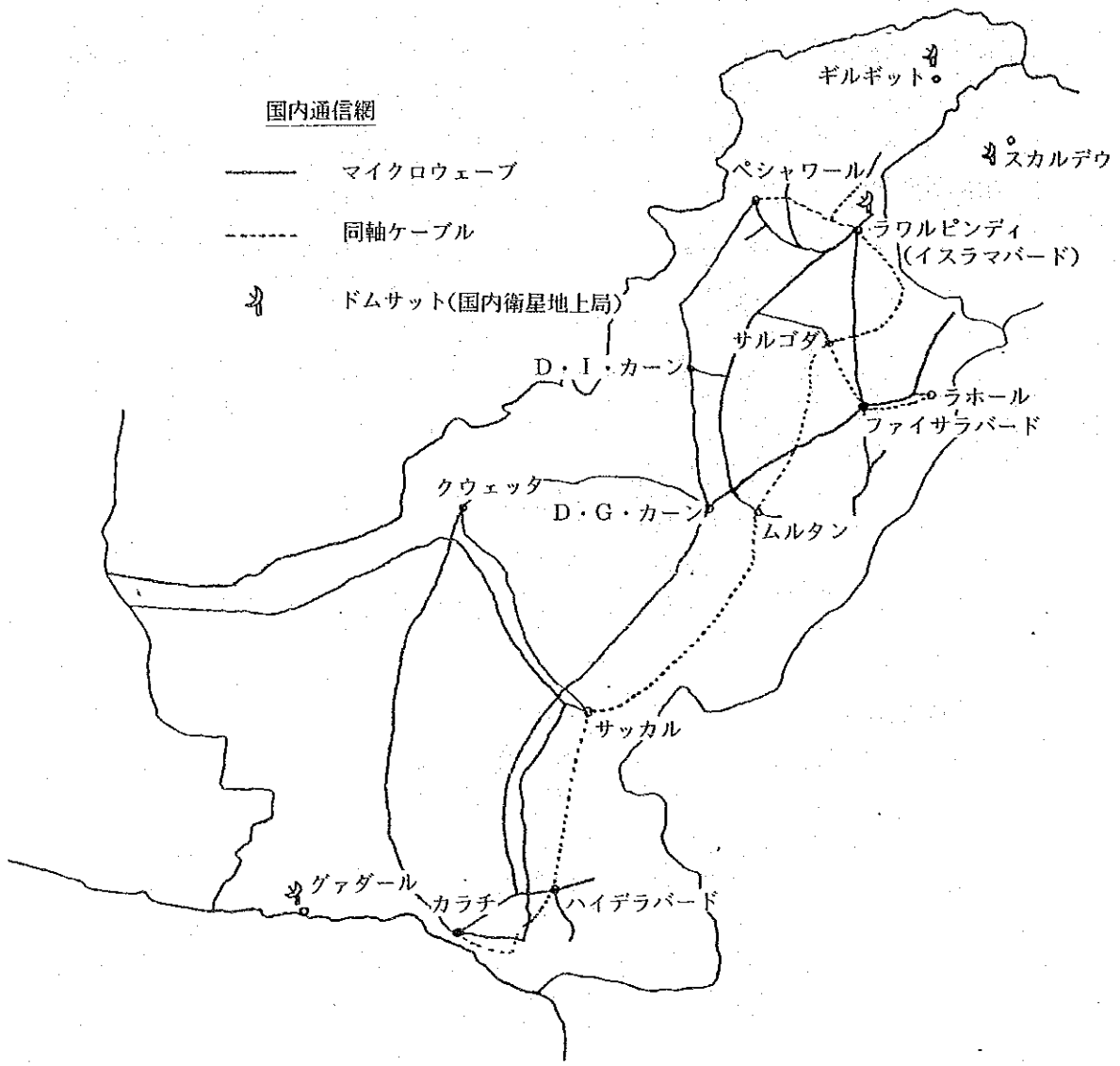
## 2. 電話設置台数

(89年度末) (単位, 1,000台)

州	設置台数	積滞数
パンジャブ	345	345
ラホール	152	130
イスラマバード	70	45
シンド	315	299
カラチ	245	275
NWFP(北西辺境州)	65	41
バルチスタン	30	20
連邦直轄地域	70	45
合計	825	750

## 3. その他統計

項目	87. 6	88. 6
電話局数	420	446
長距離電話(100万呼数)	3,417	3,780
国際電話(100万呼数)	27	41
同軸ケーブル総延長(km)	2,533	2,538
マイクロ網総延長(km)	4,780	6,445



資料7 電気通信に係わる第7次5ヶ年計画 (抜粋)



SEVENTH FIVE YEAR PLAN

(1988-93)

AND

PERSPECTIVE PLAN

(1988-2003)

REPORT

OF THE

SUB-WORKING GROUP

ON

TELECOMMUNICATION

PLANNING COMMISSION  
GOVERNMENT OF PAKISTAN  
ISLAMABAD  
JULY 1987

## P R E A M B L E

In September, 1986 the Planning Commission, Government of Pakistan, decided to constitute a working group on telecommunications for 7th Plan (1988-1993) and perspective plan ((1988-2003)), under the Chairmanship of the Secretary, Ministry of Communications, Islamabad.

The following terms of reference were laid down :-

- i) To identify short-comings and deficiencies in the existing telecommunication and post office facilities and evaluate Sixth Plan targets/achievements in particular.
- ii) To advise on policy issues for the development of telecommunications and recommend strategy for improvement of operational efficiency of the telecommunication system.
- iii) To advise on policy issues for development especially the aspect of converting T&T into self financing corporation.
- iv) To define measures for the exploitation and acquisition/adoption of new technology besides identification of the areas where the transfer of technology is required.
- v) To explore the means for private sector involvement in the field of telecommunications.
- vi) To identify ways and means for the establishment of Research and Development Institutes in the field of telecommunications and indicate steps for the development of capabilities for the local manufacture.

- vii). To identify problems of maintenance of completed projects/buildings and other physical and social infrastructures and to suggest their specific solutions.
- viii). To propose an outline of the Perspective Plan 1988-2003 and 7th Five Year programme and recommend major projects and their priorities.

The Composition of the Working Group is given below:—

- |   |          |
|---|----------|
| 1. Mr. R. A. Akhund<br>Secretary,<br>Government of Pakistan,<br>Ministry of Communications,<br>Islamabad.               | Chairman |
| 2. Signal General in Chief,<br>G.H.Q.,<br>Rawalpindi.   | Member   |
| 3. Mr. S. A. Siddiqui,<br>Government Inspector Telephones,<br>Ministry of Communication,<br>Islamabad.                  | Member   |
| 4. Malik Muhammad Saeed Khan,<br>Chief (T&C),<br>Planning Division,<br>Islamabad.                                       | Member   |
| 5. Director General,<br>Post Offices,<br>Islamabad.   | Member   |
| 6. Director General,<br>H.Q. Special Communication Organization,<br>151-A, Westridge-I<br>Peshawar Road,<br>Rawalpindi. | Member   |
| 7. Director General,<br>T&T, Islamabad.   | Member   |
| 8. Managing Director,<br>T.I.P.,<br>Haripur.  | Member   |
| 9. Managing Director,<br>Carrier Telephones Industries,<br>Sector I-9,<br>Islamabad.                                    | Member   |

- |   |                       |
|---|-----------------------|
| 10. Chief Engineering (Telecommunication)<br>Railways Head Quarters,<br>Lahore. | Member                |
| 11. A representative of N.D.F.C.,<br>P.O. Box 5082,<br>Karachi.                 | Member                |
| 12. A representative of SUPARCO,<br>Karachi.                                    | Member                |
| 13. Mr. Mehmud Hasan,<br>Deputy Chief (T&C)<br>Planning Division,<br>Islamabad. | Member/<br>Secretary. |

The first meeting of the working group was held on 1-10-1985 under the chairmanship of Mr. R.A. Akhund, then Secretary, Ministry of Communications. Two sub-committees were formed, one each for the 7th plan and perspective plan. The committee for 7th plan composed of Mr. S.A. Siddiqui, then Government Inspector, T&T (now D.G. T&T) as Chairman, with Mr. Saiedullah Alvi, Chief Engineer (Planning) as member and Mr. Muhammad Hanif Azam, Director Planning (L/O), as coopted member.

The following officers were also associated in preparation of the preliminary draft :-

1. Mr. Muhammad Akram, Director Planning (L/S)
2. Mr. S.M. Jalil, Director (Engineering & Design)
3. Mr. Malik Akhtar Hussain, Director (Fundamental Planning)
4. Col. Abdul Qadir, Director Planning (S/S)

On assumption of the office of Secretary (Communications), Mr. K.U. Faruqi held a group meeting and a series of meetings between March 87 and Aug. 87 to discuss 7th Plan in details which has now been revised in the light of these discussions.

The final report as approved by the Chairman is placed below.



In the report one chapter has been devoted to each term of reference. Annex belonging to a chapter have been placed immediately after the chapter. Recommendations have been placed at the end of the report.

T O R ( I V )

TO DEFINE MEASURES FOR THE EXPLOITATION AND  
ACQUISITION/ADOPTION OF NEW TECHNOLOGY BESIDES  
IDENTIFICATION OF THE AREAS WHERE THE TRANSFER  
OF TECHNOLOGY IS REQUIRED.

TO DEFINE MEASURES FOR THE EXPLOITATION AND  
ACQUISITION/ADOPTION OF NEW TECHNOLOGY BESIDES  
IDENTIFICATION OF AREAS WHERE THE TRANSFER OF  
TECHNOLOGY IS REQUIRED.

1. The advent of digital technology alongwith the widespread use of computers in communication, has opened up the prospect of making telecommunication services more efficient. The stored programmed controlled (SPC) exchanges have completely revolutionised the concept of switching. Digital transmission systems over fibre optics, coaxial cables and microwave links besides offering a large number of channels, have paved the way for integrating switching and transmission a concept almost impossible to implement in the Analogue Systems. This integration has also greatly reduced the prices of the switching components. The reduction in the size of exchanges has reduced the requirement of space and installation time. The maintenance of these exchanges has become much easier and more economical.

2. Most of the advanced and some developing countries had started using Digital transmission systems because of their marked advantages over the Analogue systems. The process of digitisation of switching systems in developed countries is relatively slow due to the fact that they had almost reached a point of saturation as far as the number of telephones is concerned. Digital Exchanges are therefore being provided to developing countries at a much cheaper rate because of the absence of large home markets.

3. At present there are only six lakh analogue lines. This figure was almost half of this at the time our first digital exchange was being installed. The delayed decision in selecting a particular switching system forced the department to keep expanding a comparatively out-dated system. As a consequence

about three lakh more EMD lines have been added during this period. Some of the measures proposed to be taken to derive maximum advantage from the new technology are discussed in the subsequent paragraphs.

a. Installation of New EMD lines to be phased out gradually.

In view of introduction of Digital Switching Indigenous production, the manufacture and installation of EMD lines would be gradually phased out but arrangements for producing spare parts for the operation of EMD lines would continue till such time that all the EMD lines are completely replaced by Digital switches. EMD lines will in future be used only for replacement or for the expansion/installation of those exchanges where presently small sized digital exchanges are not feasible.

b. Standardisation of at least two Switching Systems.

Although an agreement to establish a digital factory in collaboration with Messers Siemens has been finalised, yet in order to meet the future requirements in full to keep prices at a competitive rate and also to keep the doors for induction of new technology open, there is a requirement for a second switching system. If one make has a complete monopoly, there would be hardly any incentive for bringing down prices or introduce the latest technology.

c. Rural Communication.

It is felt that telecommunication could play a vital role in the development of the rural economy also.

Digital technology has the possibilities of linking even the remotest areas of the country to the national

and even international telephone/telex networks. Small digital exchanges of a capacity of a few hundred lines are available even today to link smaller towns. Multiple access systems are available for even smaller places.

Satellites have helped to link areas which were difficult to reach through conventional media. Some leased circuits which are available on international and domestic satellites would be utilised for this purpose.

d. Nation Wide Dialling.

Efficient working of our national telephone network has a direct impact on the revenue earnings of the T&T and in an indirect way, the economic growth of the country as a whole. The experience of the T&T department which is supported by ITU and other foreign experts bodies shows that almost 40% of call attempts are lost (do not mature) due to congestion in the Analogous NWD exchanges. This results in loss of revenue, subscriber frustration, and non-utilisation of international <sup>and internal</sup> circuits to their full capacity. Digital Transit Exchanges have the capability of overcoming these disadvantages. Although the useful life of an EMD exchange is about 20 years, yet their replacement at a point in time when they have completed more than half their life with digital exchange could result in increase in revenue receipt and profitability. The forbidding cost and effort of integrating, operating and maintaining them in parallel with the recently installed transit exchanges is another major consideration in favour of their early abolition.

e. ISDN (Integrated Services Digital Networks).

As the name implies a further step towards integration of transmission and switching systems is to enable the use of same pair of wires or a telephone channel for voice and non voice/<sup>subscriber</sup>services like facsimile, teletex and in time to come videotex and picturephone. ISDN shall be introduced on an experimental basis in some of our urban areas during the 7th plan by using remote subscriber Multiplex equipment.

f. High Capacity PCM Links. (Junction routes)

The high cost of laying and maintaining under ground cable, choking up of existing ducts, non-availability of space for new routes and a need for future expansion leaves the department with hardly any choice but to adopt fibre optics or a microwave system as a digital transmission media in our junction and long distance networks. Besides having a smaller diameter, the fibre optic has the capability of supporting higher order multiplex systems once the need for more circuits arises. This would eliminate the current practice of laying of network in congested areas on year to year basis. Similarly microwave systems also are relatively free of the above-mentioned problems of the long distance network.

g. Network Management.

For efficient utilisation of the most expensive part of our telecommunication system (i.e. the long distance circuits), Network Management Centres would have to be established. These Centres would monitor long distance circuits and in case of failure or congestion

In certain links, rapidly direct the traffic to alternate routes through the use of computerised network terminals and higher order switching systems.

h. Software Centre

Modern trend in hardware designing is to utilise already standardised modules being mass produced and freely available in the world market. This has made the designing easier and cheaper to produce.

However, based on the hardware, the development of software has been an extremely specialised area. The department should lay more stress in raising a team of experts and enhance the scope of the software centre established with the collaboration of Siemens, West Germany.

i. Introduction of Modern Tools for Development.

The Department must adopt modern practices and tools for the efficient execution of development projects. Data terminals linked to a main computer should be provided in all the field units, Regional Offices and various Wings in the Directorate-General for the purpose of updating and obtaining necessary data about different on-going activities.

j. R & D Centres.

Apart from the software centre, there is a requirement of bringing the R&D facilities on more modern lines. More equipment and highly qualified engineers would be needed to cope with the new technological advancements in this sphere.

k. Utilisation of existing facilities available in our Technical Universities and Institutions.

Qualified manpower required for the induction of new technology is considerable and a great effort would be needed to gear up the existing meagre training facilities. On the other hand, the present educational system rarely co-relates its final output with the trained manpower requirement in the country. There is a need for the educational establishments to actively collaborate with a user department in order to draw up a long term plan for the development of human resource requirements of the T&T during the 7th and subsequent five year plans.

CONCLUSION

The digital technology offers an opportunity to fully develop the communication system in line with national requirements and exploit it in such a way as to have a positive impact in other fields of national activities.



T O R (VI)

TO IDENTIFY WAYS AND MEANS FOR THE ESTABLISHMENT  
OF RESEARCH AND DEVELOPMENT INSTITUTE IN THE  
FIELD OF TELECOMMUNICATIONS AND INDICATE STEPS  
FOR THE DEVELOPMENT OF CAPABILITIES FOR THE  
LOCAL MANUFACTURE.

1. GENERAL

The modern technological advancement has made it necessary that Research and Development activities should be accelerated to keep pace with the development in the field of Telecommunication. Research Centre was therefore, established at Haripur during 2nd Five Year Plan in collaboration with the Government of Japan keeping in view the following objectives :-

A) Design and Development

- a) Development of equipment for telecommunication needs of Pakistan T&T Department with particular reference to indigenous resources, geographical and climatic conditions.
- b) Modifications in the installed telecommunication systems, to suit specific requirements of the country.

B) Advisory service to the department.

- a) Drafting general "standards of performance" and "equipment specifications".
- b) Carrying out system engineering.
- c) Investigation of major maintenance problems and suggest solution.
- d) Acceptance testing of newly installed systems, apparatus and plant of local and foreign origin.

C) International cooperation and coordination.

- a) Coordination with I.T.U.
- b) Evaluation of world-wide standards with I.T.U.
- c) Cooperation with industries and institutions.

The centre made some headway and helped in development of capabilities, inspite of financial and staff limitation. Feeling the necessity for expanding this centre T&T established in 1980 a

Research Centre by the name of Central Telecommunication Research Laboratory at Islamabad with the collaboration of Japanese Government at a cost of Rs. 130 (M)

This centre is to be further expanded to work on modern lines and cope with the adaptation of latest technologies. The laboratories are proposed to be re-organised with emphasis on applied research which would also be maintenance oriented. Besides the above following would also be emphasised:-

1. Calibration and standardization.
2. Integration of systems.
3. Type approval of equipment developed by other organisations/private sector.
4. Economic evaluation of various systems.
5. Preparation of engineering instructions on the systems introduced.
6. Launching of Pilot Projects.

Generally speaking as compared to Pakistan, which is spending 0.17% of GNP on R&D activities, India is spending 0.47%, Sri Lanka 0.3%, Japan 2.1% and USSR 4.8%. Pakistan, in general, and the T&T Department in particular are at a very low level of spending on R&D. It is proposed that to start with around 0.4% of the total budget allocation for the 7th Five Year plan should be reserved for R&D activities which would be oriented to develop also capabilities for local manufacture. The 7th Five Year Plan requirement is expected to be around Rs. 55645 (M) Thus an amount of Rs. 225(0) should be allocated to R&D.

Several Pilot Projects will be launched. A general list of requirements is as under:-

- I. Buildings:  
Establishment of new laboratories.

## II. Research Facilities:

- a) Modern Instrumentation for existing facilities and for new disciplines like Optic Fibre/Satellite, etc.
- b) Documentation Centre.
- c) Standard Instruments and Calibration Laboratory.
- d) Establishment of Software Centre.

## III. Personnel:

At present the department has only 9 graduate engineers with supporting staff working in the CTRL. This number is totally inadequate. The need is to train about 100 engineers to work on R&D activities.

### Know-how

Technical know-how on modern systems and technologies and future trends in R&D would be acquired, through literature, training of personnel, collaboration with other R&D organisations and exchange of experts. The Research library would also be expanded.

### Development of local Manufacture

Enhancing of R&D activity will definitely give boost to local design and manufacture.

T&T also has the intention to upgrade its factories by adopting latest technology and enhancing their manufacturing capability. T.I.P. has already taken two steps in this regard by switching their manufacturing line from F-1 type of switch to EMD and now to digital switching. Essential electronic components production by these factories would be encouraged on a selective basis. Another factor which will enlarge the capability for local manufacturing is

de-regulation of certain items/systems and encourage  
to the private manufacturers to divert their attention  
to the telecommunication field.

## SUMMARY OF RECOMMENDATIONS

Term of Reference No. I about identifying deficiencies and short-comings in the existing telecommunications facilities and evaluation of Sixth Five Year Plan achievements:

High priority should be given to telecommunication in the overall national plan.

Sufficient allocation of funds should be made available to meet the full public demand for telephones and to ensure integrated development of the system.

Greater financial/administrative autonomy should be given to the T&T Department to enable it to plan and execute its development programme more efficiently.

Term of Reference No. II about the policy issues for the development of telecommunications and strategy for improvement of operational efficiency of the telecommunication system during the 7th Plan.

Clearance of total pending demand for telephones and to raise telephone density from .64 to 2.00 percent.

Adoption of modern/digital technology to improve operational efficiency.

Transfer of technology and indigenous manufacture of telecommunication equipment to the maximum extent feasible.

Expansion of telecommunication facilities to more rural areas.

Introduction of new subscribers services like teletex, telefax, videotex, electronic mail and mobile/paging services.

Development of human resources with special emphasis on the modernization of planning and technical units and developments of managerial skills.

## SUMMARY OF RECOMMENDATIONS

Automation of testing and maintenance facilities.  
Establishment of subscriber support systems.  
Establishment of network management centres and to provide sufficient spare capacity on Long Distance routes.  
Introduction of computerised directory assistance system.  
Replacement of worn out assets and overhaul of the system as a whole.

Term of Reference No. III, about the policy issues for development especially of converting (T&T) into a self financing Corporation.

The Telegraph and Telephone Department should be converted into an fully autonomous statutory Corporation.

Term of Reference No. IV, about measures for the exploitation and acquisition/adoption of new technology and identification of the areas where transfer of technology is required.

Exploitation of digital technology to the maximum extent both in Switching and Transmission systems and make extensive use of computer technology.

Phasing out of EMD switch production and full utilization of indigenous Digital Switching Factories. Production of digital transmission equipment in Carrier Telephone Industries (Pvt) Ltd/ NRTC as far as possible.

Selection of second digital switch and establishment of second switching factory alongwith transfer of technology.

Introduction of small capacity digital exchanges to rural areas.

More and more use of PCM digital links/optic fibre systems in junction networks.

Network management through automatic/computerized switching.

Software development at home and enhancement of R&D facilities.

## SUMMARY OF RECOMMENDATIONS

More use of computers as management and development tools.

Gradual introduction of integrated services digital network systems for provision of additional facilities to subscribers.

Term of Reference No. V, about to explore the means for private sector involvement in the field of telecommunications.

The T&T Department would encourage the private sector to share in providing telecommunication facilities to the general public subject to regulations made for use of standardized equipment, of specifications laid down by the Department.

The private sector would be eligible for participation in the following fields :-

- a). Manufacture of switching and transmission equipment, components and accessories like connectors, tag blocks, cabinets, DPs, jointing material etc.
- b) Provide services like :-
  - i) Booths of PCOs, Telex, facsimile, data, answer back service etc.
  - ii) Chamber facilities for Teleconferencing and video conferencing etc.
  - iii) Mobile telephony and paging systems etc.
- c) Some works can be awarded on contract basis to private sector. For example cable laying, Tower erection and foundation work etc.

T&T when permitted by act by law <sup>go</sup> can also to/into raising private financing by such means as Bearer bonds/Subscriber bonds, term financing certificates, syndicate loans etc. to overcome its financial difficulties.



Term of Reference No. VI, about identifying ways and means for the establishment of Research and Development Institutes in the field of Telecommunications and to indicate steps for the development of capabilities for local manufacture.

During 7th Plan the allocation for R&D is proposed to be raised to 0.4% of total capital investment and increase the strength of R&D engineers to 100 in order to further expand C.T.R.L. to work on modern lines and cope with the adaptation of latest technologies with greater emphasis on Applied Research which shall also be maintenance oriented.

To add the following facilities in R&D centres :

- a) Calibration and standardization
- b) Integration of systems
- c) Type approval of equipment developed by other organizations/ private sector
- d) Economic evaluation of various systems
- e) Engineering instructions for newly introduced systems
- f) Launching of pilot projects
- g) Modern instrumentation
- h) Documentation centre
- j) Calibration laboratories
- k) Establishment of software centre
- l) Library literature, training, collaboration and exchange of experts
- m) Development of local designs as far as possible

Term of Reference No. VII, about identifying  
problems of Maintenance of completed projects/buildings  
and other physical and social infrastructure so as to suggest  
specific solutions.

Adequate funding to be allocated for maintenance purposes.

Operation and Maintenance Centres in major cities to be set up with modern tools and automatic testing facilities.

Subscriber Support Centres to be set up with latest test equipment and rapid mobile squads.

Steps to be taken to standardize equipment that may be connected to T&T network.

Block wiring for telephones to be made compulsory for new buildings.

Lanes for services along major roads to be allocated by authorities and better coordination to be done.

Training facilities to be strengthened.

All worn out/defective assets to be replaced with new ones according to a phased programme.

Long distance maintenance Regions will be created and development work re-organized to enable GMs of maintenance to devote full time to maintenance problems.

Term of Reference No. VIII about, to prepare an outline of Perspective Plan. 1988-2003 and 7th Five Year Programme and to recommend major projects and their priorities.

A target of 1,318,000 new telephone lines has been set for 7th plan to clear all pending demand by 1993.

A throwforward of 204,000 lines of 6th plan is also to be met in the 7th plan period.

A replacement of 138,000 lines is also provided in the 7th plan.

70,000 Long Distance channels will be added to meet NWD, Trunk, data and leased circuits requirements.

10,000 new overseas circuits will be provided.

5400 new telex lines and 1000 new facsimiles will be provided.

Total installed capacity in the country by June 1993 as to be provided by the end of 7th plan is 2,280,000 lines and by June 2006/June 2008 is projected to be 9,360,000 and 11,640,000 lines respectively. The density of telephones respectively is expected to rise to 2.01, 5.55 and 6.49 percent.

Total funds of Rs. 55645 millions with Foreign Exchange Component of Rs. 27199 millions are required to meet targets set above during 7th plan.

158,300 lines approximately or 12.0% of total lines are planned for rural area development by adoption of suitable cost effective transmission systems.

5000 new PCOs are planned to be opened during 7th plan to provide new communication links to the villages.

NWD facility shall be extended to all stations with planned capacity of 400 lines and above and all the Tehsil Headquarters Irrespective of the number of lines to be installed (auto exchange lines).

A second digital factory will be set up alongwith Siemens digital factory production raised to full capacity and shortfall if any will be met through off the shelf purchase as and when necessary.

It is expected that T&T Department will be converted into a statutory autonomous corporation and shall be able to meet Rupee component from its own resources after meeting its debt servicing liabilities. Govt. should arrange soft foreign loans so that T&T is able to meet its development objectives.

Training and Research facilities shall be modernized and augmented.

Social welfare facilities will be improved and enhanced to improve the lot of the employees.

With modernization and automatization staff strength shall be reduced as far as possible.

Projects given on pages 18, 28-31 costing Rs. 46130 million with F.E. Component of Rs. 22466 million shall be initiated during the 7th plan.



# TELECOMMUNICATION STAFF COLLEGE



Pakistan Telecommunication Corporation  
Telecommunication Staff College Haripur

## 1. Introduction

The Pakistan Telegraph & Telephone Department has been aware of the training needs of its staff members from the very beginning. It initiated its training activities in 1949 with the establishment of one Telecommunications Training Centre at Faisalabad and two Regional Telecommunications Training Centres at Lahore and Karachi. The Telecom. Training Centre was shifted to Haripur in 1955 and renamed as Telecommunications Staff College in 1956. Three more Regional Telecommunications Training Centres were established at Peshawar, Sukkur and Rawapindi. All the five Regional Centres were renamed as Regional Telecommunication Training Schools. In addition to these training institutions, a number of Divisional Telecommunications Training Centres were also set up at various places of the country to meet the training needs of various levels of staff.

The Telecommunications Staff College is situated at Haripur, nearly 60 kilometres north of the Capital, Islamabad and 3 kilometres south of Haripur Railways Station. Beautiful scenic spots fall on the way from Islamabad to Haripur. These include Taxila Museum, Budda University and Khanpur Dam.

The College campus has four blocks which house administrative sections, Class/syndicate rooms, laboratories, library and Conference room. There is also a spacious Auditorium with seating capacity of about 300 for informal lectures and film shows.

### 1.1. Accommodation

There are three hostels for accommodating 450 trainees as detailed below:-

Hostel No.1	...	...	144 trainees
Hostel No. 2	...	...	242 trainees
Hostel No. 3	...	...	64 trainees.

Normally two trainees are accommodated in each room. An independent room may be allotted to a trainee if the training load permits.

### 1.2. Sports

Sufficient space and facilities exist for spare time relaxation and sports activities. Playgrounds for hockey, cricket, football, volley ball, lawn tennis and squash are just adjacent to the dormitories and the campus. Every hostel has a common room with facilities for indoor games. Near the hostels, there is a mosque for boarders.

### 1.3. Achievements

Expansion of the college is continuously taking place in a phased manner to cater for the ever growing training needs arising out of the rapid increase in size complexity of the telecommunication network. Achievements of the college since its inception are given on page 20, 21.

### 1.4. Training charges

The training facilities are mainly for the staff of Pakistan Telegraph & Telephone Department. Trainees are either sent for training by the concerned recruiting regions or by the Director General, Telegraph & Telephones. Trainees from organizations other than T&T, and from abroad are entertained with the approval of the Director General, Telegraph & Telephone Department, Islamabad. Rs. 3500 per week per trainees are charged as training fee from personnel belonging to organizations other than Pakistan T&T. These do not including boarding/lodging charges at Haripur and travelling/hotel expenses incurred during field training outside Haripur. Approximately Rs 1000 per month are required by each trainee for boarding and lodging at Haripur.

## 2. TRAINING COURSES

Following are the courses conducted at Telecommunications Staff College, Haripur:-

### 2.1. Pre-service Courses

#### 2.1.1. Assistant Divisional Engineers Course (Duration : 2-years)

Minimum academic qualification required for this cadre is Engineering Degree in Electrical/Electronics/Telecommunication or an equivalent qualification from a University/Institute duly recognised by the Government of Pakistan. The candidates are selected by the Federal Public Service Commission on the demand of Director General, Telegraph and Telephone, Islamabad through a competitive examination.

#### 2.1.2. Accountants Course (Duration : 2-years)

Minimum academic qualification required for this course is B.A/B.Sc. The candidates are selected by the Federal Public Service Commission on demand from Director General T&T through competitive examination.

#### 2.1.3. Engineering Supervisors Course (Duration 18-months)

Minimum qualification required for this cadre is a Diploma of Associate Engineer in Electrical, Electronics, Telecommunication Engineering or Airconditioning from a Board of Technical Education in Pakistan.

The candidates are selected through an interview by a board consisting of three Directors of the T&T Department. The selection and appointment is made by the respective Telecommunication Region.

#### 2.1.4. Telegraph Masters Course (Duration : 6-months)

Minimum qualification for this cadre is matriculation. this course is pre-requisite for the Departmental Telegraphists who qualify for promotion to the cadre of Telegraph Masters.



## 2.2. In-service Courses

These courses are for Engineering Supervisors/Telegraph Masters/Assistant Engineers/Assistant Divisional Engineers/Accounts Officers/Divisional Engineers/Directors etc. In-service courses of short duration (1 to 6 weeks) are conducted according to pre-scheduled programme for the respective financial year. Each course is planned with a definite purpose and objective. These courses are arranged in the various sectors of Telecom. Staff College. The modular structure of In-service training courses affords both flexibility and economy in fulfilling individual and collective needs of refreshing the training already acquired or updating the knowledge/skill to meet the technological development.

A list of Pre-service/In-service courses conducted by the institutions is annexed.

**LIST OF PRE-SERVICE COURSES**  
**ASSISTANT DIVISIONAL ENGINEERS**  
**52 - WEEKS TRAINING PLAN OF ASSISTANT DIVISIONAL ENGINEERS**

**PHASE-I (BASIC)**

**MODULE-1**

**11 Weeks**

- |   |         |
|---|---------|
| 1. Reporting/Joining                                    | 1 Week  |
| 2. Telcom Staff College Training                        | 8 Weeks |
| 3. Evaluation   | 1 Week  |
| 4. Field Trg/Mid-term-break and Margin for Holidays etc | 1 Week  |

**PHASE-II**

**MODULE-2**

**10 Weeks**

- |                                  |         |
|----------------------------------|---------|
| 1. T.S.C. Training               | 8 Weeks |
| 2. Evaluation                    | 1 Week  |
| 3. Mid-term-break/Field Training | 1 Week  |

**MODULE-3**

**10 Weeks**

- |                             |         |
|-----------------------------|---------|
| 1. TSC Training             | 8 Weeks |
| 2. Evaluation               | 1 Week  |
| 3. Field Trg/Mid-term-break | 1 week  |

**MODULE-4**

**10 Weeks**

- |                                  |         |
|----------------------------------|---------|
| 1. TSC Training                  | 8 Weeks |
| 2. Evaluation                    | 1 Week  |
| 3. Min-term-break/Field Training | 1 Week  |

**MODULE-5**

**11 Weeks**

- |                       |         |
|-----------------------|---------|
| 1. TSC Training       | 8 Weeks |
| 2. Evaluation         | 1 Week  |
| 3. On-Job-Attachement | 2 Weeks |

LIST OF PRE-SERVICE COURSES  
ASSISTANT DIVISIONAL ENGINEERS

DETAILS OF T.S.C. TRAINING

MODULE-1 (BASIC)

360 Periods (8 Weeks)

1.	Introduction to ITU	6	Periods
2.	Basic Telephone	105	"
3.	S.P.C. Switching	90	"
4.	Telegraphs and Power Plant	45	"
5.	Line Transmission	45	"
6.	Radio Propagation	45	"
7.	Administrative Procedure	24	"

Total:- 360 Periods

One Week 45 Periods

One Period 40 Minutes

**LIST OF PRE-SERVICE COURSES**  
**ASSISTANT DIVISIONAL ENGINEERS**

<u>MODULE-2</u>	<u>TELEPHONY</u>	<u>360 PERIODS</u>	<u>8 WEEKS</u>
<u>Course Code</u>	<u>Duration</u>	<u>Course Title</u>	
050201 050203	82 Periods	EMD Local Switching System I and II.	
050202 050204	60 Periods	Electromechanical NWD System I and II.	
050601	45 Periods	AXE-10 Digital Switching System	
040100	16 Periods	Local Network Planning	
050602/3	125 Periods	EWSD Switching System I & II	
051000	16 Periods	Signalling System	
100000	16 Periods	Traffic Engineering	
<u>MODULE-3</u>	<u>TELEGRAPH SERVICES</u>	<u>360 PERIODS</u>	<u>8 WEEKS</u>
030700	45 Periods	Teleprinters	
090000	45 Periods	Power Plants	
090900	24 Periods	Air-conditioning	
050802 050804	30 Periods	Telex System (Nedix) I & II.	
060700	16 Periods	Data Communication	
040301 040302 040303 040701	66 Periods	Outside line Plant, and Cables	

110301	45 Periods	Accounting Procedure
000302	08 Periods	Building Maintenance
000301	16 Periods	Vehicle Maintenance
050900	08 Periods	Telematic Services
010000	45 Periods	Management & Public Relation
100001	12 Periods	Telecommunication Planning
<b>MODULE-4</b>	<b>LINE TRANSMISSION</b>	<b>360 PERIODS</b>
		<b>8 WEEKS</b>
<u>Course Code</u>	<u>Duration</u>	<u>Course Title</u>
060402		4 MHz Coaxial Cable system
060405		4 MHz Coaxial Cable Equipment
060404	84 Periods	1.3 MHz
060201		12-channel carrier system.
060407	36 Periods	Coaxial Cable Maintenance
060800		Optical fiber system
060350	72 Periods	12-Channel Carrier Equipment (OS-1/Z-12F CTI)
061001	48 Periods	Time Division Multiplexing
061001		30/32 CTI PCM System
061450	60 Periods	Optical Fiber Digital Line Equipment (GEC)
060901	48 Weeks	Telegraph Transmission System (WT-100/WT-1000)
100200	12 Periods	I.T.M.C.

MODULE-5      RADIO TRANSMISSION      360 PERIODS      8 WEEKS

070302	78 Periods	STORNO VHF System Maintenance
070402		CTI UHF System Maintenance
070501	45 Periods	N.E.C. Microwave
070502	57 Periods	Toshiba Microwave
070505	36 Periods	Digital Microwave
070300	45 Periods	Rural/MTS
070900		
070600	36 Periods	Satellite Communication.
070450	51 Periods	Microwave System engineering
051100	12 Periods	Principles of Rates & Tariff

LIST OF PRE-SERVICE COURSES  
ACCOUNTANTS

PHASE-I (26 weeks)

<u>Course Code</u>	<u>Duration</u>	<u>Course Title</u>
000001	1 week	Introduction to Telegraph & Telephone Department.
110001	3 weeks	Office Management
110001	3 weeks	Office Management
110002	2 weeks	Business Communication – Precis & draft
110003	2 weeks	Business Communication – Report writing
110004	4 weeks	Fundamental and Supplementary Rules
110301	6 weeks	Compilation of Government Accounts
110302	2 weeks	Economics
110303	2 weeks	Business Mathematics and Statistics
110304	2 weeks	Data Processing
	2 weeks	Field Training

PHASE-II (26 weeks)

110305	5 weeks	Commercial Accounting
110306	3 weeks	T&T Accounts Engineering Works
110307	3 weeks	Stores and Workshop Organization
110308	4 weeks	T&T Revenue Accounts Statistics
110309	3 weeks	Financial Management
110310	2 weeks	Commercial & Performance Auditing
051100	1 week	General Tariff principles & Accounting (International) in Telecom. Services
110311	1 week	Auditing of Government Accounts
110312	1 week	Cost Accounting
110100	1 week	Mercantile Law
	2 weeks	Field Training

LIST OF PRE-SERVICE COURSES

ENGINEERING SUPERVISORS

78-WEEKS TRAINING PLAN

PHASE-I (BASIC)

26 WEEKS

- |    |                                |          |
|----|--------------------------------|----------|
| 1. | Reporting and Joining          | 1 Week   |
| 2. | Telecom Staff College Training | 20 Weeks |
| 3. | Evaluation                     | 1 Week   |
| 4. | Field Training/Term Break      | 3 Weeks  |
| 5. | Margin for Holidays            | 1 Week   |

PHASE-II (SPECIALIZATION)

52 WEEKS

- |    |                               |          |
|----|-------------------------------|----------|
| 1. | T.S.C. Training               | 30 Weeks |
| 2. | Field Training/Mid-Term Break | 2 Weeks  |
| 4. | Margin for holidays           | 2 Weeks  |
| 5. | On-The-Job Attachment         | 4 Weeks  |
| 6. | Practice                      | 12 Weeks |

One Week            45 Periods

One Period            40 Minutes



LIST OF PRE-SERVICE COURSES

ENGINEERING SUPERVISORS

PHASE-I

DETAILS OF T.S.C. TRAINING

20 WEEKS

<u>Course Code</u>	<u>Duration</u>	<u>Course Title</u>
110350	25 Periods	Introduction to Department, ITU and Account Procedure
020150	100 Periods	Mathematics
020350	70 Periods	Applied Electricity
020650	135 Periods	Basic Telephony
060050	100 Periods	Line Transmission
070050	100 Periods	Radio Principles
020352	125 Periods	Introduction to Electrical Equipment
020351	200 Periods	Basic Electronics and Introduction to computer
110351	45 Periods	Introduction to code Books, Manuals and Accounts
<hr/>		
<u>Total</u>	<u>900 Periods</u>	
One Week	45 Periods	
One Period	40 Minutes	

LIST OF PRE-SERVICE COURSES

ENGINEERING SUPERVISORS

PHASE-II

DETAILS OF TSC TRAINING

30 WEEKS

1. OUTSIDE PLANT

<u>Course Code</u>	<u>Duration</u>	<u>Course Title</u>
040250	270 Periods	Overhead Line and Wires
040350	540 Periods	Underground cables
030350	540 Periods	Subs. Apparatus and PMBX's/PAX's
Total	1350 Periods	

2. ELECTRONIC SWITCHING SYSTEM

120150	270 Periods	Computer Hardware
120650	360 Periods	Computer Software
050650	180 Periods	SPC Techniques
050651	112 Periods	SPC Exchanges (E-10B, AXE-10)
050653	45 Periods	I.G.E.
060750	23 Periods	Data Communication
050652	360 Periods	E.W.S.D.

**DETAILS OF T.S.C. TRAINING****30 WEEKS****3. Electromechanical local switching system (E.M.D.)**

<u>Course Code</u>	<u>Duration</u>	<u>Course Title</u>
050250	720 Periods	F-6 (a) EMD system structure and description of switching circuits.
050251	292 Periods	Maintenance and operation of EMD selector, signal circuit and R.S.M.
050252	135 Periods	Information Test and Complaint Procedure.
050253	113 Periods	EMD 4-armed switch and 70r flat type relay adjustment.
100050	90 Periods	Traffic Engineering Principle.
<u>Total</u>	<u>1350 Periods</u>	

**4. Electromechanical long distance switching system (N.W.D.)**

051250	495 Periods	NWD System Preliminary
051251	667 Periods	NWD System Advanced
051252	188 Periods	NWD System Auxiliary
<u>Total</u>	<u>1350 Periods</u>	

**5. Electrical**

090450	272 Periods	Power Plant Equipment.
090950	212 Periods	Air conditioning Equipment.
050950	86 Periods	Teleprinter-100
050951	60 Periods	Teleprinter-1000S
050850	90 Periods	Electronic Telex Switching.
	630 Periods	Practice
<u>Total</u>	<u>1350 Periods</u>	

DETAILS OF T.S.C. TRAINING30 WEEKS6. Radio Communication

<u>Course Code</u>	<u>Duration</u>	<u>Course Title</u>
070050	132 Periods	Propagation.
070350	180 Periods	UHF/VHF Communication
070950	114 Periods	Mobile communication System
070550	135 Periods	Microwave Fundamentals
070551	180 Periods	Toshiba Microwave
070553	180 Periods	N.E.C. Microwave Equipment
070552	90 Periods	Digital Microwave
070650	114 Periods	Satellite Communication
070051	90 Periods	Instrumentation.
070351	135 Periods	Rural Communication.
<u>Total</u>	<u>1350 Periods</u>	

7. Line Transmission

060350	312 Periods	Maintenance and Operation of 12 channel carrier Equipment.
060450	32 Periods	1.3 MHz Coaxial Cable Equipment (N.E.C).
060451	300 Periods	4 MHz Coaxial Cable System (N.E.C).
060452	32 Periods	12 MHz Coaxial Cable Equipment.
060950	194 Periods	Telegraph transmission System.
060351	156 Periods	Maintenance and Operation of 30/32 Channel PCM Equipment (CTI).
060453	168 Periods	Optical fibre and Coaxial Cable Maintenance Techniques.
061450	156 Periods	34 M bits/sec Optical Fibre Digital Line Transmission System (G.E.C).
<u>Total</u>	<u>1350 Periods</u>	

SPECIALIZATION COURSE FOR TELEGRAPH MASTERS

<u>Course Code</u>	<u>Duration</u>	<u>Course Title</u>
4302	4 weeks	Traffic Instructions (Traffic 'A')
4503	1 weeks	I.T.U. Telegraph Relations, (Traffic 'B')
4303	2 weeks	Traffic Accounts (Traffic 'C')
4304	2 weeks	Traffic Establishments & General Rules (Traffic 'D')
4305	2 weeks	Telegraph Equipments (Tech-Ia).
4306	2 weeks	Telegraph Equipments (Tech-Ib).
0101	2 weeks	Applied Electricity (Tech IIa).
0102	1 weeks	Applied Electricity (Tech IIb).
<u>Total :</u>	<u>16 weeks</u>	

T.S.C. Training	16 Weeks
Mid Term Field Training	2 Weeks
Examination	2 Weeks
On-Job-Training	4 Weeks

Total :- 24 Weeks

**LIST OF IN-SERVICE COURSES**  
**ES's / AE's / ADE's**

**TELEPHONE SECTOR**

<u>Course code</u>	<u>Duration</u>	<u>Course Title</u>
API-10	3 Weeks	EMD Switch/Relay Adjustment
API-02	5 Weeks	Maintenance of EMD F-6 (a) Auto exchange equipment.
API-14	4 Weeks	EMD Signals & Testing/Auxiliary equipment.

**N.W.D. SECTOR**

APT-03	4 Weeks	NWD Interface Equipment.
APT-04	4 Weeks	MPS and RFS.
APT-02	4 Weeks	8-Armed Switch and ESK Relays
APT-05	4 Weeks	REGO and REGTR
APT-06	4 Weeks	TRL and Auxiliary Equipment.

**LINE PLANT SECTOR**

ALG-01	2 Weeks	Planning of Local Network.
ALG-12	3 Weeks	Loading/Balancing and Pressurization.

**ELECTRICAL SECTOR**

AEP-12	5 Weeks	Maintenance of Thyristor Controlled & magnetic Controlled Rectifiers.
AEP-24	4 Weeks	Maintenance of T-1000s.
AEP-11	2 Weeks	Maintenance of Engine Generator.

**ELECTRONIC SWITCHING SYSTEM SECTOR**

APE-01	4 Weeks	Fundamentals of SPC Switching
Specialist-B	7.5 Weeks (45 days)	Maintenance of EWSD exchanges
Tech	3.4 Weeks (20 days)	Maintenance of EWSD exchanges

**PCM & OPTICAL FIBRE SECTOR**

<u>Course code</u>	<u>Duration</u>	<u>Course Title</u>
ACP-03	2 Weeks	Maintenance & Operation of PCM 30/32 CTI.
ACP-05	3 Weeks	Maintenance & Operation of 34 Mb Optical Fibre System G.E.C.

**LINE TRANSMISSION SECTOR**

ACO-04	2 Weeks	Maintenance & Operation of Z12F CTI System.
ACC-12	4 Weeks	Maintenance & Operation of Coaxial Cable System.

ACT-12	2 Weeks	Maintenance & Operation of WT-1000 V.F.T. Systems.
ACM-02	4 Weeks	Maintenance & Operation of Test & Measuring Equipments.
ACM-01	4 Weeks	multiplex Equipment (FDM) Style 7R.
<b><u>RADIO SECTOR</u></b>		
AWU-41	4 Weeks	Maintenance & Operation of UHF/VHF Systems.
AWS-11	2 Weeks	Satellite Communication (FDM).
AWU-51	3 Weeks	Mobile Telephone Systems.
AWM-51	3 Weeks	Measurement & Measuring parameters.
AWM-61	3 Weeks	Digital Microwave Equipment (NERA).

**WTL's / ARTO's / ESS Traffic**

**RADIO TRAFFIC SECTOR**

ATW-01	4 Weeks	Administration of CRO.
ATW-10	4 Weeks	Additional ITU Radio Regulation.
ATW-11	4 Weeks	Gentex/Telex Foreign Traffic Rules & Regulations.
ATW-21	4 Weeks	Message Re-transmission system on computer.

**TELEGRAPH TRAFFIC SECTOR**

**(FOR TM's / AC's / AST's).**

<u>Course code.</u>	<u>Duration</u>	<u>Course Title</u>
ATT-13	4 Weeks	Accounting Procedure Special Services Operation T-1000s.
ATT-12	4 Weeks	Gentex and Telex working.
ATT-01	4 Weeks	Telegraph Administration E & D Rules 73, Guide Line to Enquiry Process.
ATT-00	4 Weeks	Techniques of Supervision, Teleprinter working.

**ACCOUNTS & GENERAL SECTOR**

AG-2	3 Weeks	Accounts Administration for Accountants (B-16)
TOT	2 Weeks	Techniques of Training (For Instructors).
AG-3	2 Weeks	Accounts/Administration (For Accounts Officers)

**COURSES FOR DIVISIONAL ENGINEERS**

BP-4	2 Weeks	Signalling Systems.
BG-5	2 Weeks	T&T Accounts and Rules.
BG-8	2 Weeks	Material Management.

BP-8	2 Weeks	EDP Concepts
BG-6	2 Weeks	Management
SPEC-A	10 Weeks (55 days)	E. W. S. D.

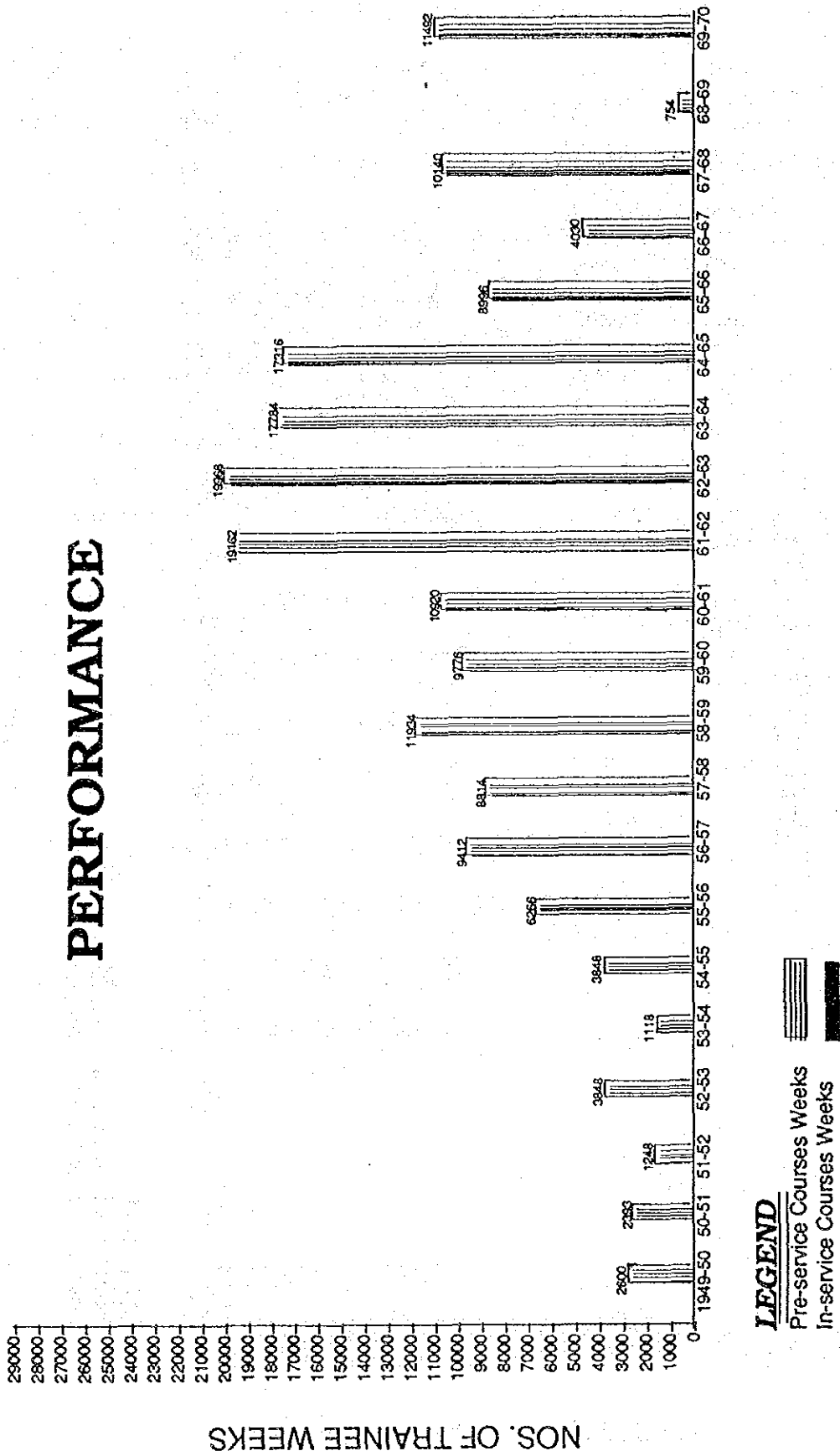
### GENERAL COURSES FOR DIRECTORS

#### Seminars

Subject of the seminar, to be held in a particular year, is decided keeping in view its utility for the Department.



# PERFORMANCE

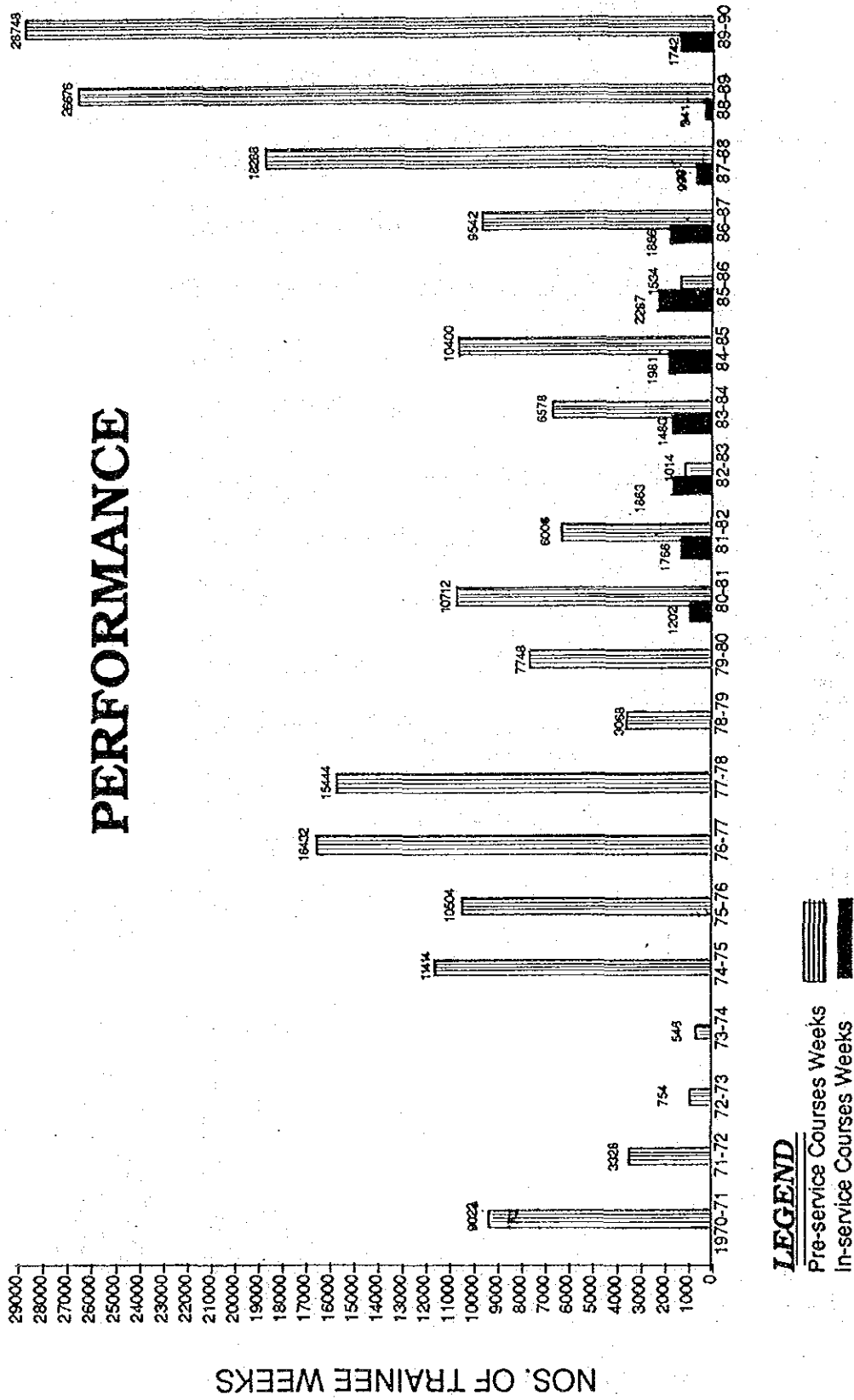


## LEGEND

Pre-service Courses Weeks

In-service Courses Weeks

# PERFORMANCE



**LEGEND**

- Pre-service Courses Weeks
- In-service Courses Weeks

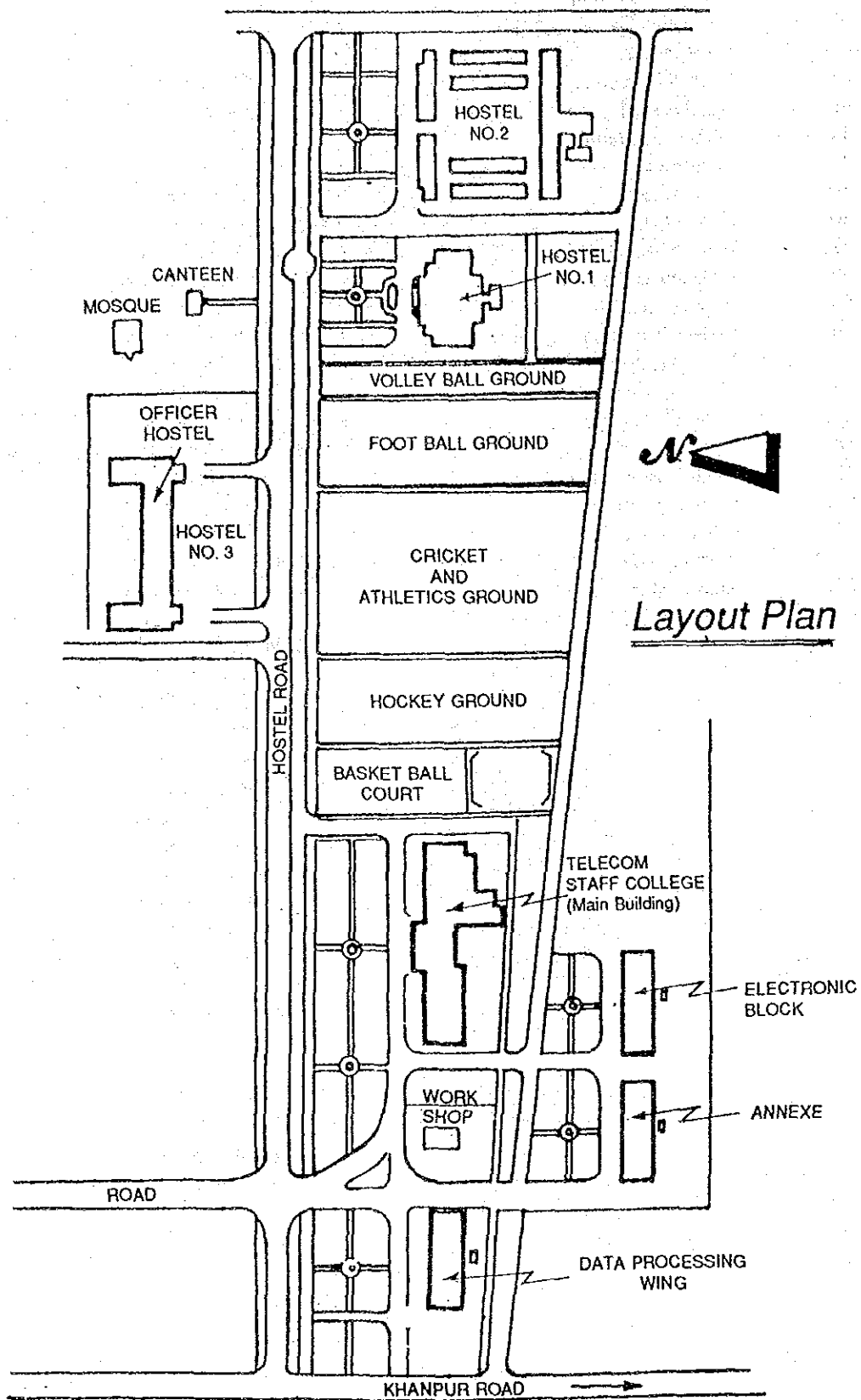
DETAILS OF TRAINEES FROM ABROAD

<u>Countries</u>	<u>No. of Trainees</u>	<u>Level=Pak. T&amp;T.</u>	<u>Year</u>	<u>Trade</u>
1. Kuwait	11	Senior Tech.=E.S	1964-66	Telephone Wireless
2. Jordan	83	Senior Tech=E.S Engineer=A.D.E	1969-70 1971-72 1975	Telephone Telegraph Carrier.
3. Mkdavian	1	E.S.	1972-74	Carrier/Wireless
4. Saudi Arabia	3	E.S.	1974-76	Telephone
5. U.A.E.	16	Tech	1974-76	Telegraph Carrier/ Wireless
6. Bangladesh	4	ADE, Director	1980-81	Carrier/Wireless P.C.M./E.M.D.
7. Oman	1	Engineer	1983	Telephone, Telegraph & Carrier
8. Sri Lanka	6	APT Trainees	1981	PCM, Coaxial Cable & Microwave.
9. Nepal	3	APT Trainees	1981	Carrier/Coaxial/ Microwave.
10. Peoples Republic of CHINA	1	APT Trainee	1981	Microwave.
11. Bhutan	2	APT Trainees	1984	Microwave.
12. Sri Lanka	2	APT Trainees	1985	Elect.
13. Brunai Darul Salam	1	Tech. officer = E.S.	1988-89	Microwave

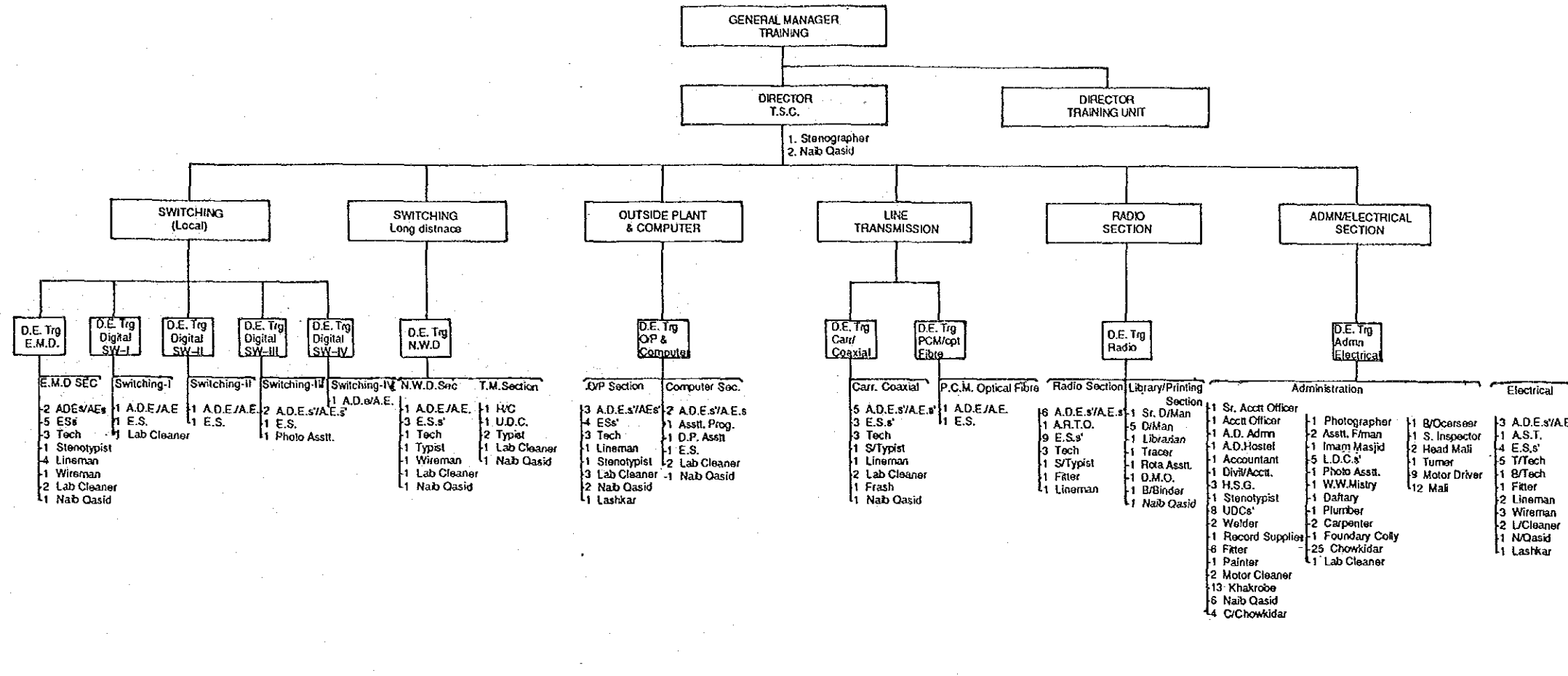
INSTRUCTIONAL STAFF

<u>S/NO.</u>	<u>NAME</u>	<u>DESIGNATION</u>
1.	Muhammad Aslam	Director
2.	Sarfraz Mahmood	D. E., TRG
3.	Ghulam Muhammad	"
4.	Muhammad Shahid	"
5.	Ghulam Sarwar	"
6.	Atta Muhammad Baloch	"
7.	Masood-ur-Rehman	"
8.	Hassan Raza Shah	"
9.	Nazir Ahmed	"
10.	Ikhtiar Ahmed Qureshi	"
11.	Naseem Ahmed Naseem	A.D.E. TRG
12.	S. Raza Hussain Shah	"
13.	Muhammad Daud Awan	"
14.	Muhammad Ashraf Sharaf	"
15.	Iqbal Muhammad Anwar	"
16.	Abdul Karim	"
17.	Romail Khan	"
18.	Ali Muhammad Jauhar	Asstt. Engineer
19.	Abdul Majeed	"
20.	Fakharuddin	"
21.	Khawaja Muhammad Khan	"
22.	Muhammad Asharaf	"
23.	Abdul Hayee Khan	"
24.	M.S.P. Qureshi	"
25.	Muhammad Alam	"
26.	Muhammad Amjed Beg	"
27.	Qadeer Ahmed	"
28.	Muhammad Eqbal Ahmed	"
29.	S. Yousaf Hussain	"
30.	Ghulam Farced	"
31.	Muhammad Jamil	Asstt Programmer
32.	Muhammad Aslam	Data. Ent. Sup.
33.	S. Mansab Ali Zaidi	A.S.T.
34.	Muhammad Yaqoob	A.R.T.O.
35.	Taj Muhammad	A.O.
36.	Muin-ud-Din	Accountant
37.	Abid Mushtaq	E.S. TRG
38.	Fazal-e-Rehim	"
39.	Javed Iqbal Malik	"
40.	Ziafat Din	"

41.	Muhammad Javaid Alam	"
42.	Muhammad Munir	"
43.	Muhammad Anwar Amer	"
44.	Badri Sarwar	"
45.	Khawaj Muhammad	"
46.	Aqeel Ahmed	"
47.	Muhammad Jamil	"
48.	Fida Hussain	"
49.	Ashfaq Ali	"
50.	Khalid Jamil	"
51.	Muhammad Pervez	"
52.	Muhammad Siddique	"
53.	Faqir Ahmed	"
54.	Muhammad Sadiq	"
55.	Muhammad Arif	"
56.	Mushtaq Ahmed Khan	"
57.	Ikrām-ul-Haq Qureshi	"
58.	Muhammad Younas	"
59.	Abrar Hussain Shah	"
60.	Fazal-e-Qadeem	"
61.	G.N.I. Vohra	"
62.	Bagh Hussain	"
63.	Khawaj Muhammad	"
64.	Niamat Masih	"



**ORGANISATION CHART OF TELECOM. STAFF COLLEGE HARIPUR**



SANCTIONED STRENGTH OF STAFF			
SNO	NAME OF POSTS	NO. OF POSTS	GRADE
1.	Director	1	19
2.	Divl Engr. Training	11	18
3.	Sr. Accounts Offr Trg	1	18
4.	Account Offr Trg	1	17
5.	Asstt. Prog	1	17
6.	Asstt. Supdt Traffic	1	16
7.	Asstt. Radio Traf Off	1	16
8.	Asstt. Director Hostel	1	16
9.	Asstt. Director (Admn)	1	16
10.	Asstt. Engineer Trg	1	16
11.	Data Processing Asstt	1	16
12.	Accountant	1	16
13.	Stenotypist	5	12
14.	Sr. Draughtsman	1	11
15.	Draughtsman	5	11
16.	Photographer	1	13
17.	Asstt. Foreman	2	11
18.	Building Overseer	1	11
19.	Head Clerk	4	11
20.	Divl Accountant	1	13
21.	Engg. Supervisor	33	11
22.	Imam Masjid	1	09
23.	Stenographer	1	15
24.	Telecom Technician	18	08
25.	Boiler Technician	1	08
26.	Librarian	1	07
27.	U.D.C.	10	07
28.	L.D.C.	5	05
29.	L.D.C. Typist	7	05
30.	Sanitary Inspector	1	05
31.	Rota Assistant	1	05
32.	Wekler	2	05
33.	Tracer	1	05
34.	Photo Assistant	2	05
35.	W.W.Mistry	1	05
36.	Lineman	9	04
37.	Filter	8	04
38.	Duplicating Mach Oper	1	04
39.	Motor Driver	9	04
40.	Wireman	5	03
41.	Turner	1	03
42.	Plumber	1	03
43.	Blue Printer	1	03
44.	Painter	1	03
45.	Carpenter	2	03
46.	Record Supplier	1	02
47.	Daltari B/Binder	2	02
48.	Motor Cleaner	2	01
49.	Naib Qasid/Farash	18	01
50.	Head Mail	2	02
51.	Mail	12	02
52.	Khakrobe	13	01
53.	Chowkidar	25	01
54.	Cook-Cum-Chowkidar	4	01
55.	Foundary Coll	1	01
56.	Lab Cleaner	17	01
57.	Lashkar	2	01







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