

# PENDAHULUAN

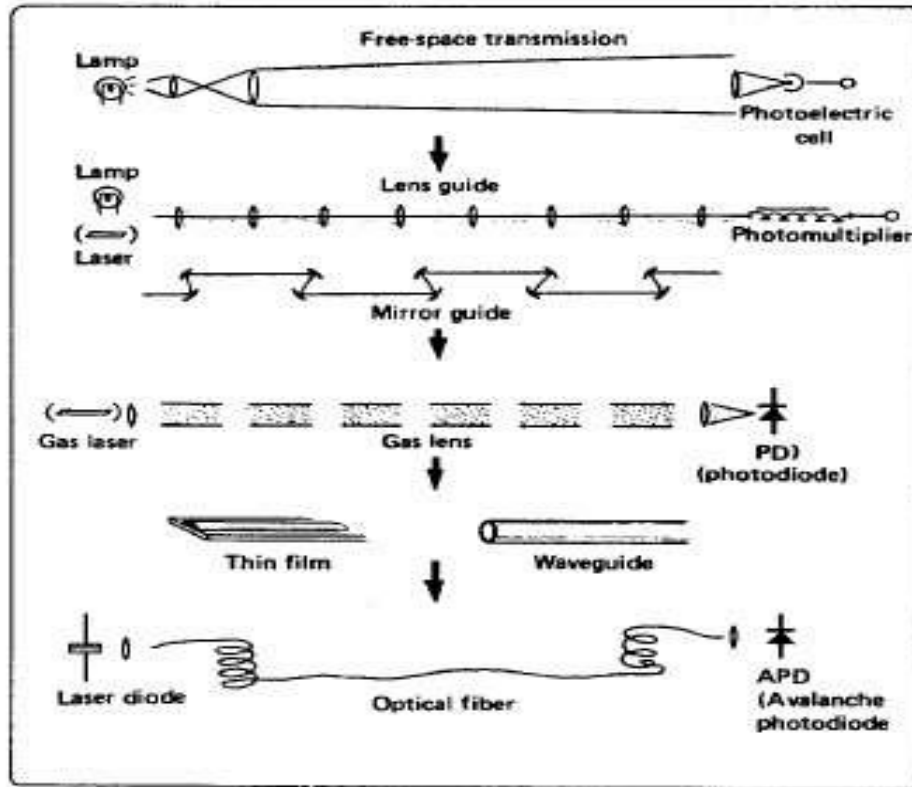
Ref : Berbagai sumber

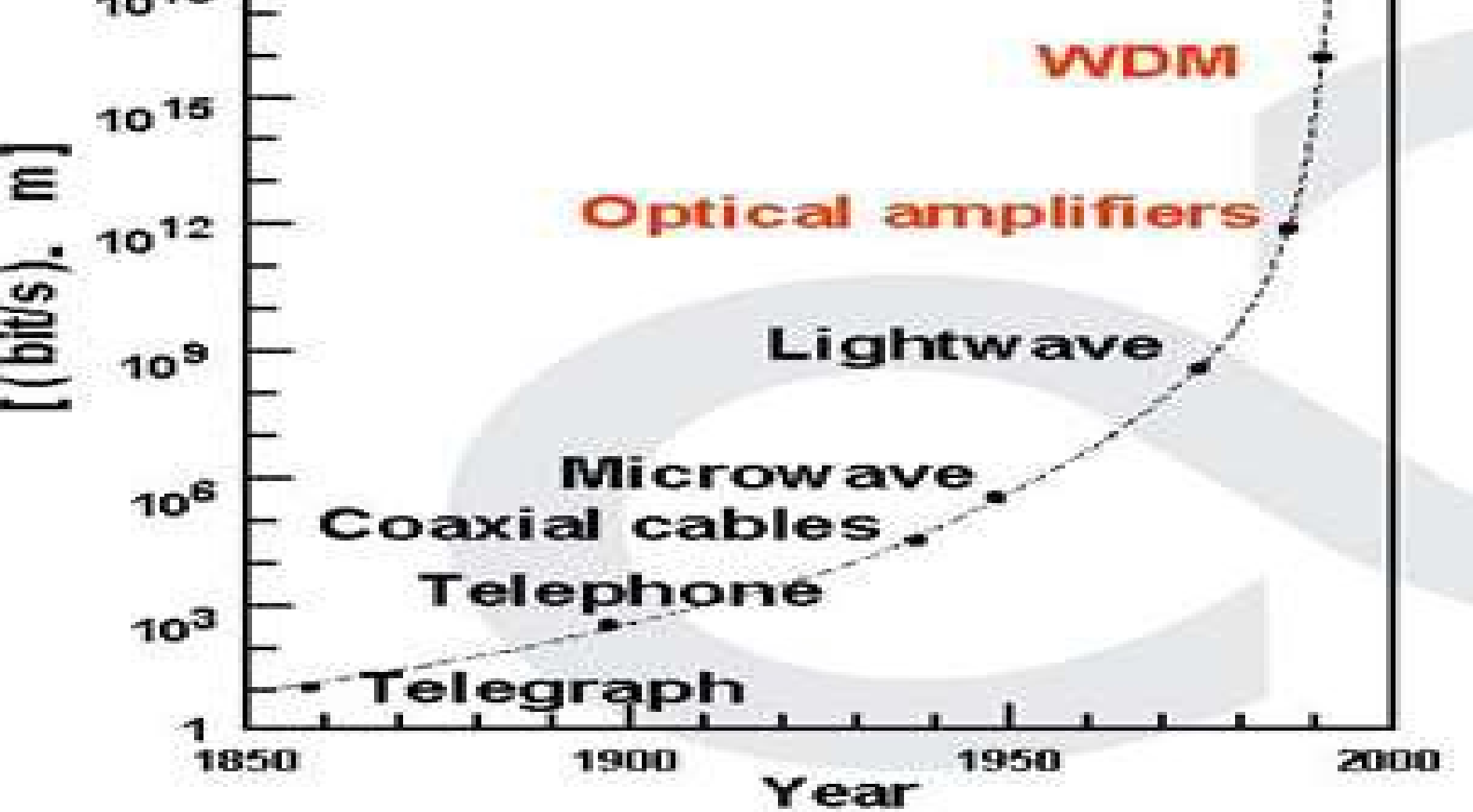
# Sejarah siskom optik

- Komunikasi gerakan tangan, mata sebagai detektor dan otak sebagai prosesor
- Komunikasi dengan menggunakan asap
- Lampu → kedip-kedipkan sesuai informasi yang dikirim
- 1880, Graham Bell menemukan sistem komunikasi cahaya disebut photophone → menggunakan cahaya matahari yang terpantul dari sebuah cermin tipis termodulasi voice. Di penerima cahaya matahari termodulasi itu jatuh pada cell selenium photoconducting yang langsung mengubahnya menjadi arus listrik



# EVOLUSI KOMUNIKASI OPTIK

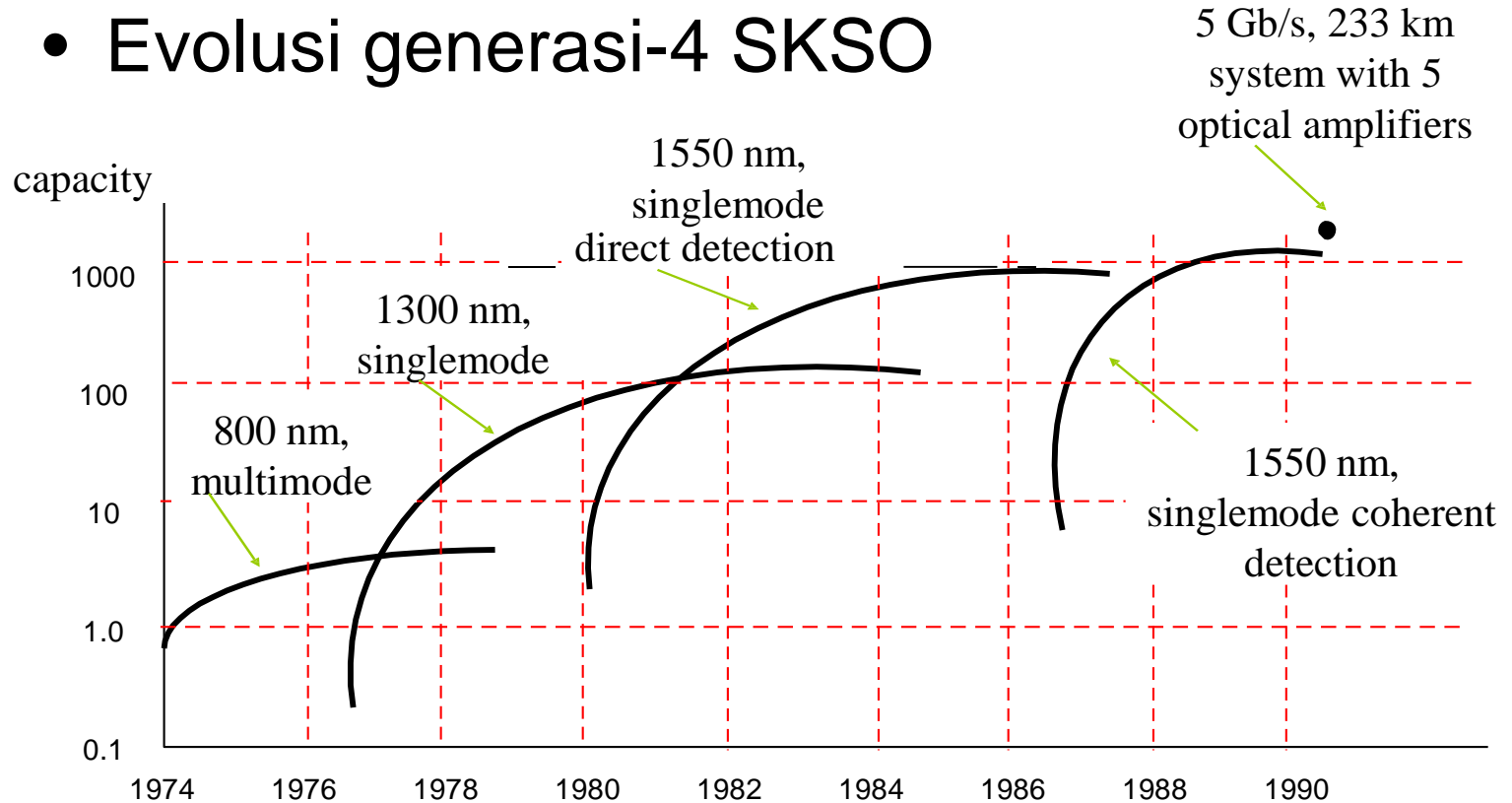


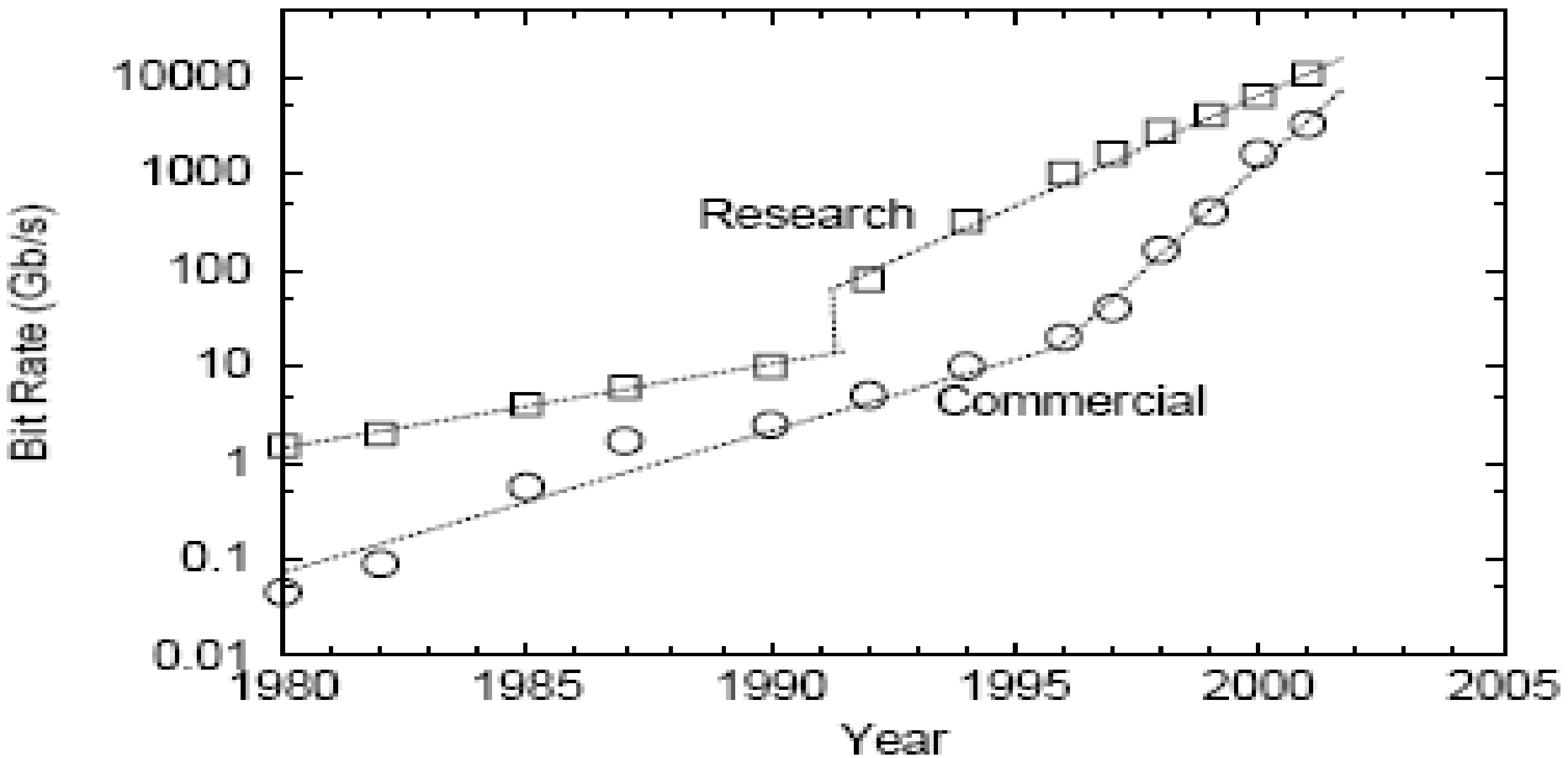


Peningkatan Bit rate – Distance Product

# Perkembangan SKSO

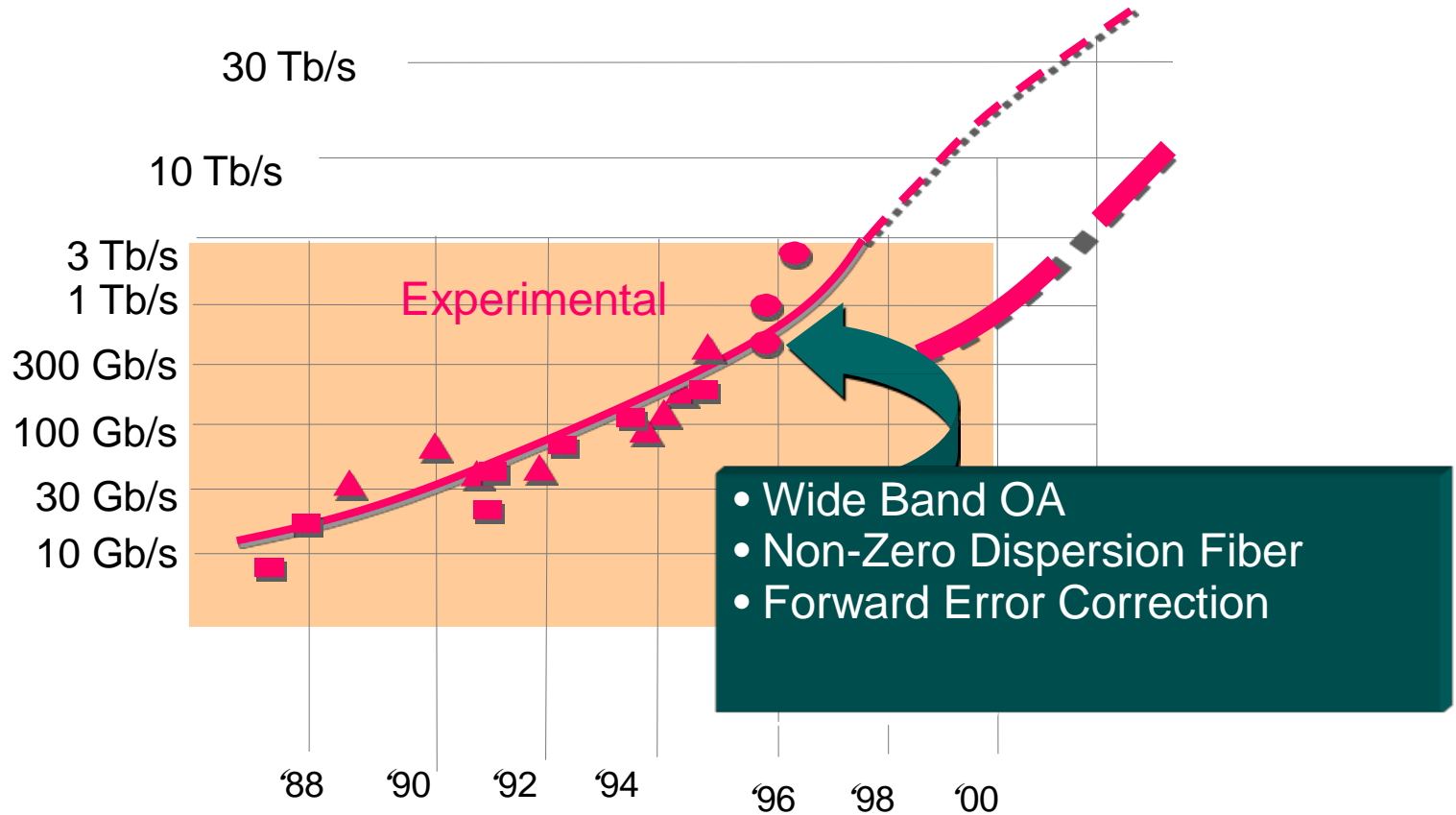
- Evolusi generasi-4 SKSO





**Peningkatan kapasitas gel cahaya, perubahan kemiringan setelah digunakan WDM**

# Increasing Transmission Capacity per Fiber



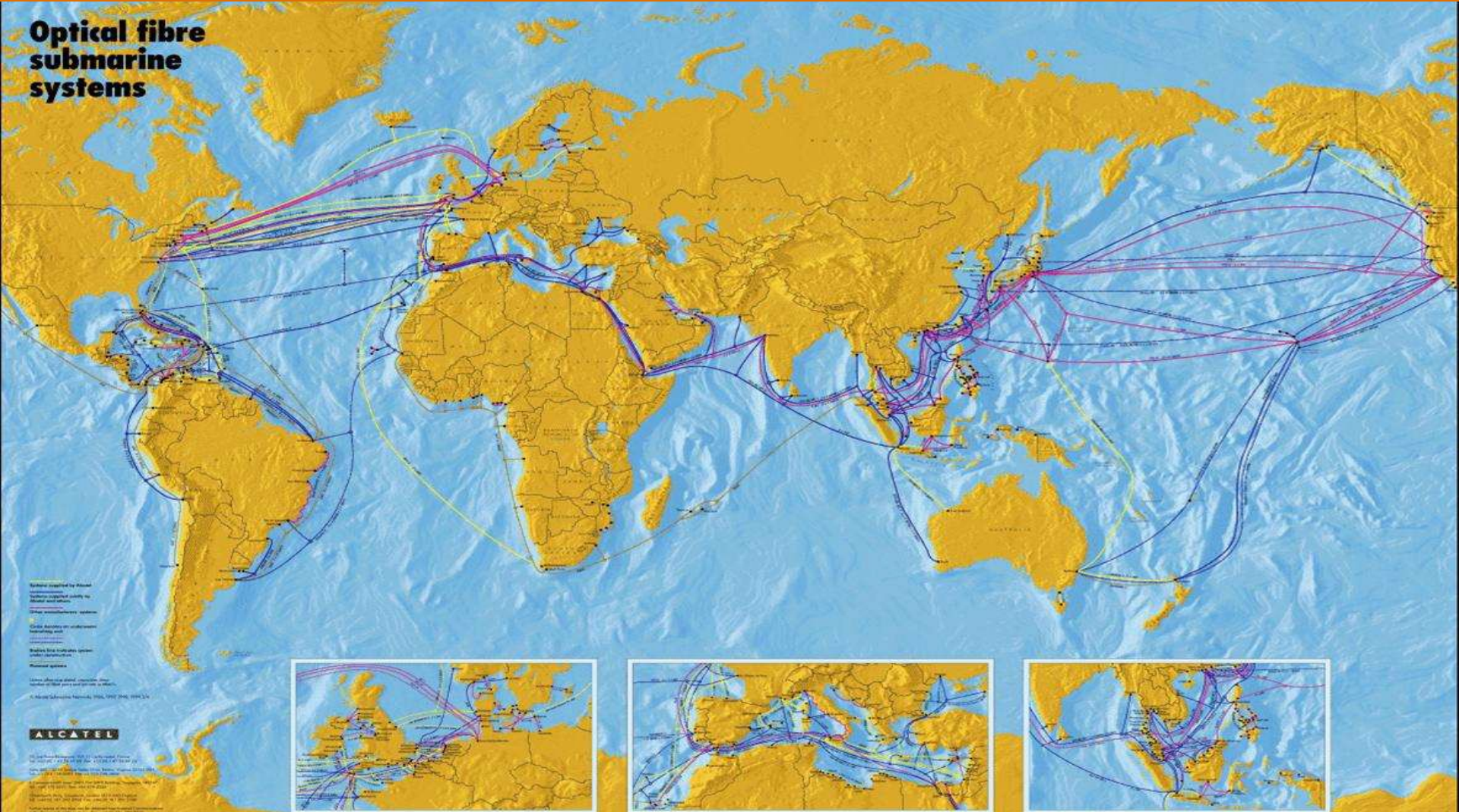
Lease bandwidth not fiber

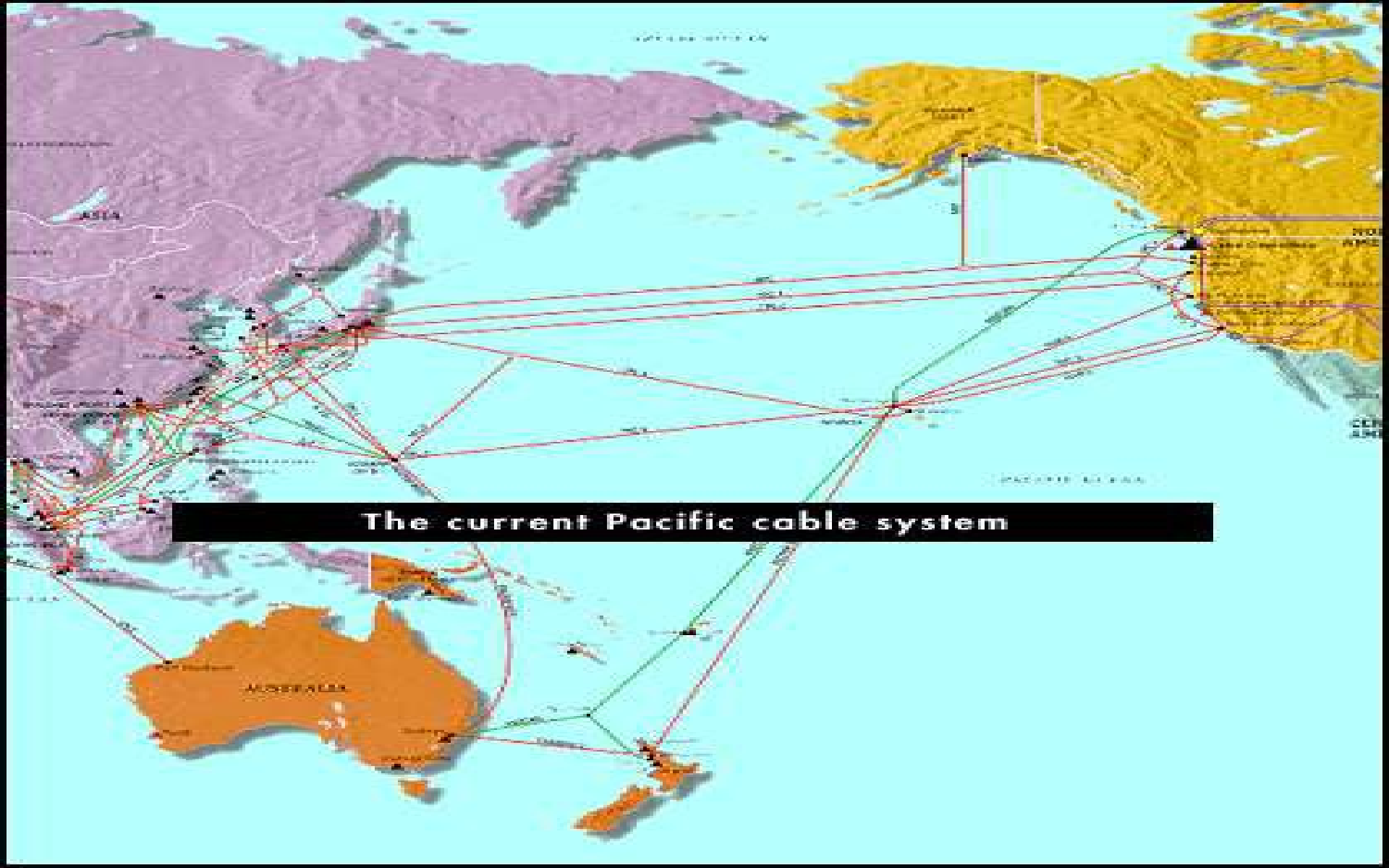


NTT was able to achieve 69.1 Tbit/s transmission by applying wavelength division multiplex (WDM) of 432 wavelengths with a capacity of 171 Gbit/s over a single 240 km-long optical fiber on March 25, 2010.

# World Wide Submarine FO Networks

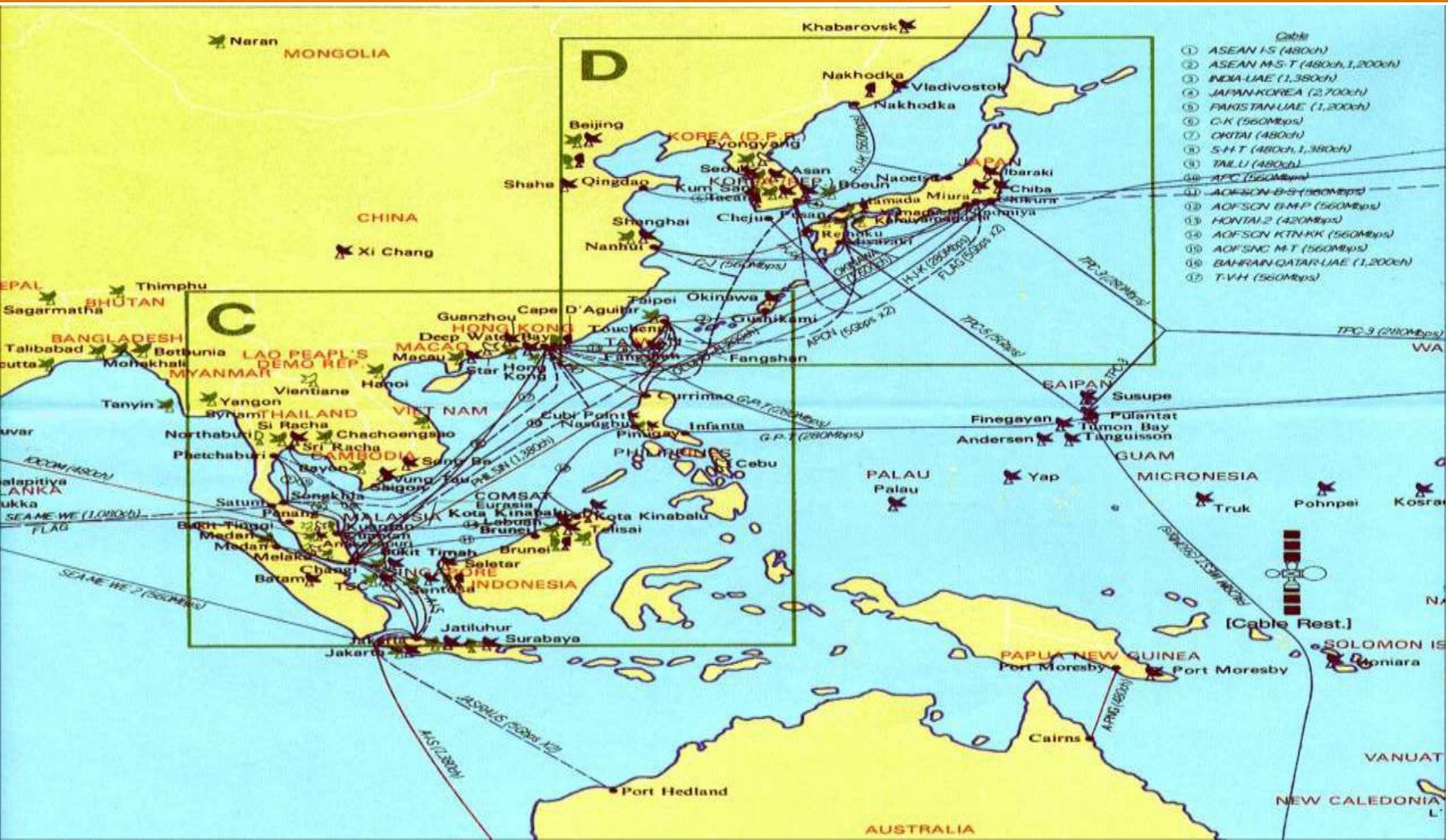
## Optical fibre submarine systems





**The current Pacific cable system**

# South-East Asia and the Far-East



- Cable**
- ① ASEAN I-S (480ch)
  - ② ASEAN M-S-T (480ch, 1,200ch)
  - ③ INDIA-LAE (1,380ch)
  - ④ JAPAN-KOREA (2,700ch)
  - ⑤ PAKISTAN-LAE (1,200ch)
  - ⑥ C-K (560Mbps)
  - ⑦ OKTAI (480ch)
  - ⑧ S-H-T (480ch, 1,380ch)
  - ⑨ TAILU (480ch)
  - ⑩ APC (560Mbps)
  - ⑪ AOFSCN B-S (560Mbps)
  - ⑫ AOFSCN B-M-P (560Mbps)
  - ⑬ HONTAI 2 (420Mbps)
  - ⑭ AOFSCN KTN-KK (560Mbps)
  - ⑮ AOFSCN M-T (560Mbps)
  - ⑯ SAHARA (560Mbps)
  - ⑰ BAHRAIN-QATAR-LAE (1,200ch)
  - ⑱ T-V-H (560Mbps)

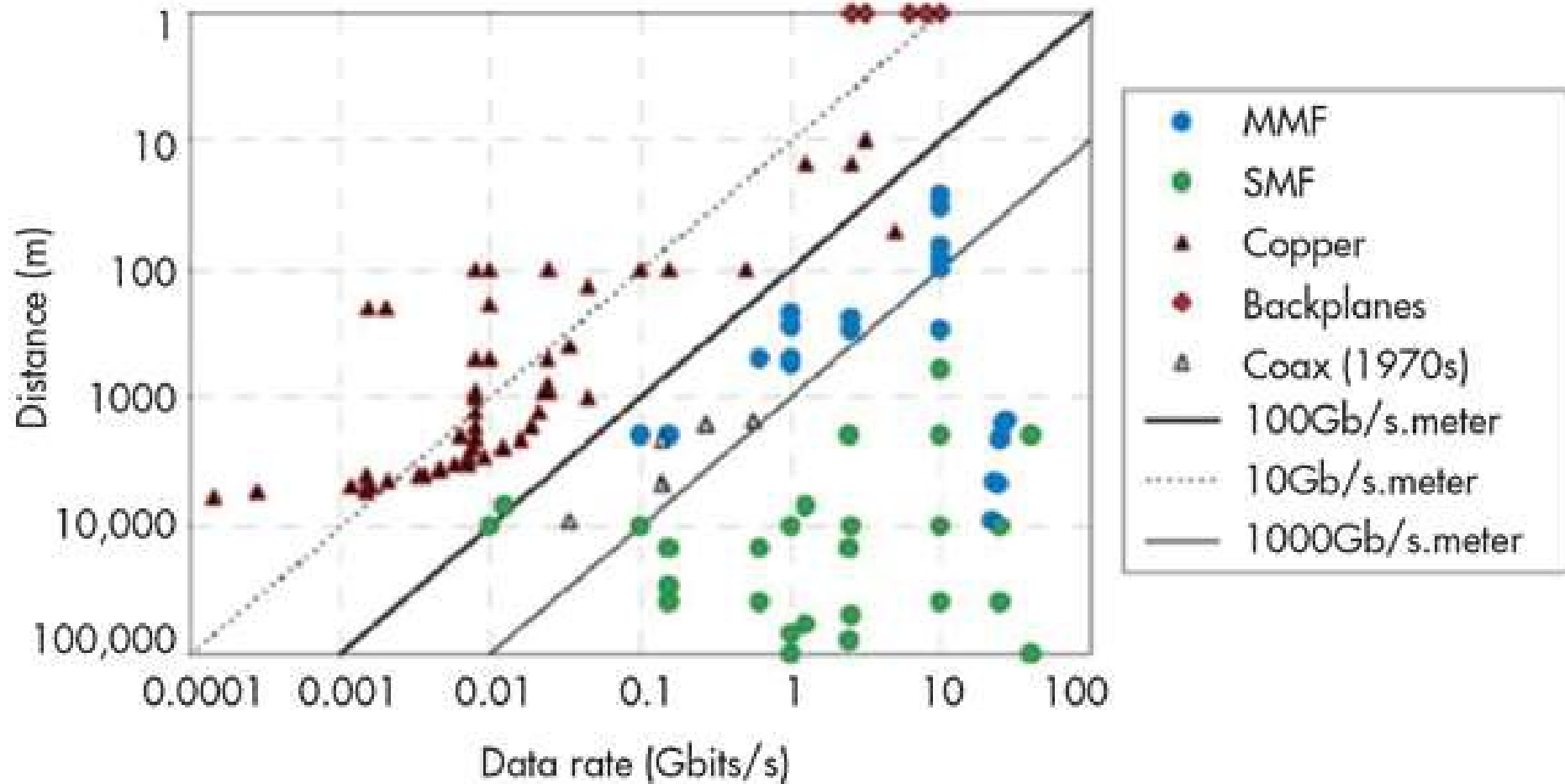
## **Kenapa memilih Fiber ?**

- **Wide bandwidth**
  - **Fiber bandwidth & losses independent of diameter**
- **Lower costs than copper**
  - **For high bandwidth signals**
  - **Cost-bandwidth crossover point constantly decreasing**
- **Light weight & low volume**
  - **“50 miles per gallon”**
- **Immunity from electromagnetic interference (EMI)**
  - **No EM pickup**
  - **Elimination of crosstalk**
- **Elimination of sparking**
- **Compatibility with modern solid state devices**

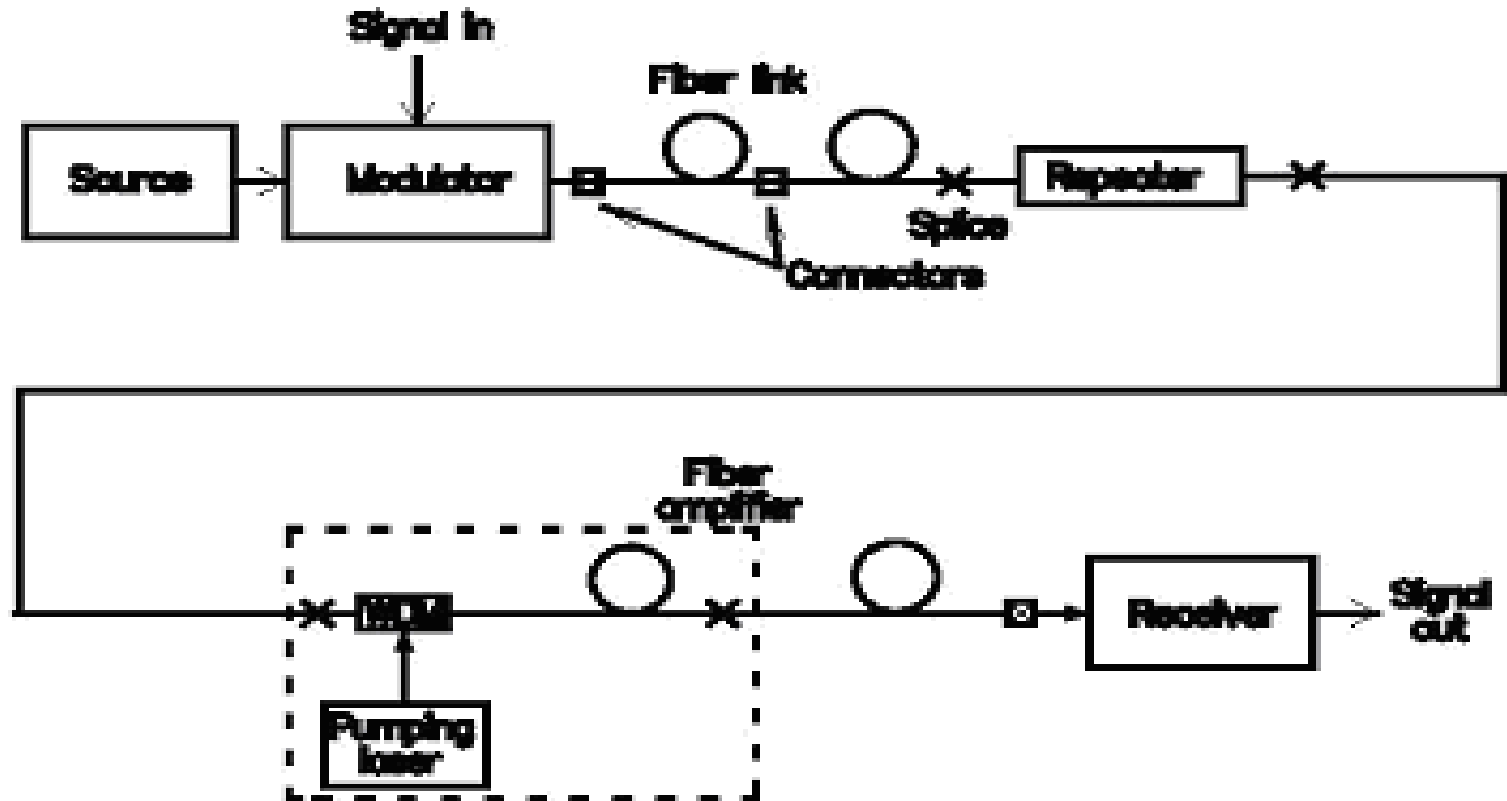
## **Pilihan selain Fiber ?**

- **Lack of bandwidth demand**
  - **HDTV requires high bandwidth**
- **Lack of standards**
  - **Standards being set by**
    - » **DoD**
    - » **Telecomm industry**
    - » **Computer industry**
- **Radiation darkening**
  - **Depends on dose, exposure, glass materials, impurity types and levels**
  - **Clears with time**

# Throughput vs distance



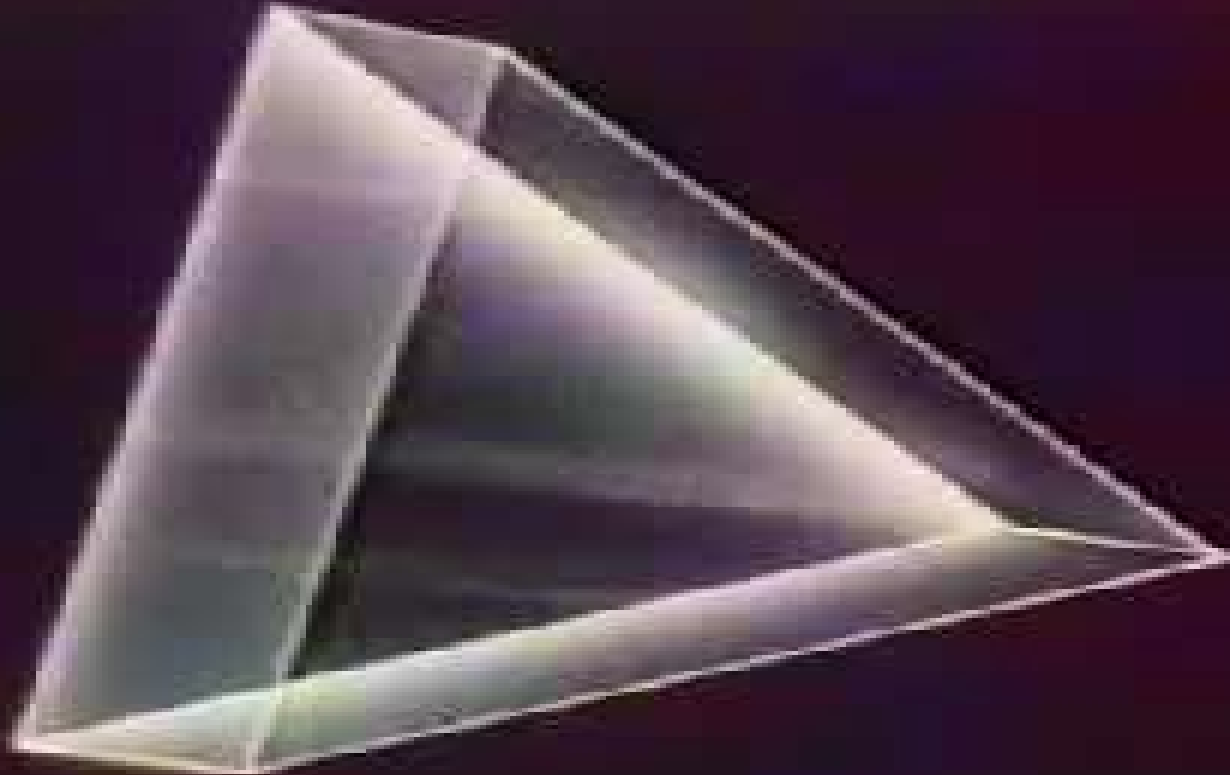
# Sistem Komunikasi Optik



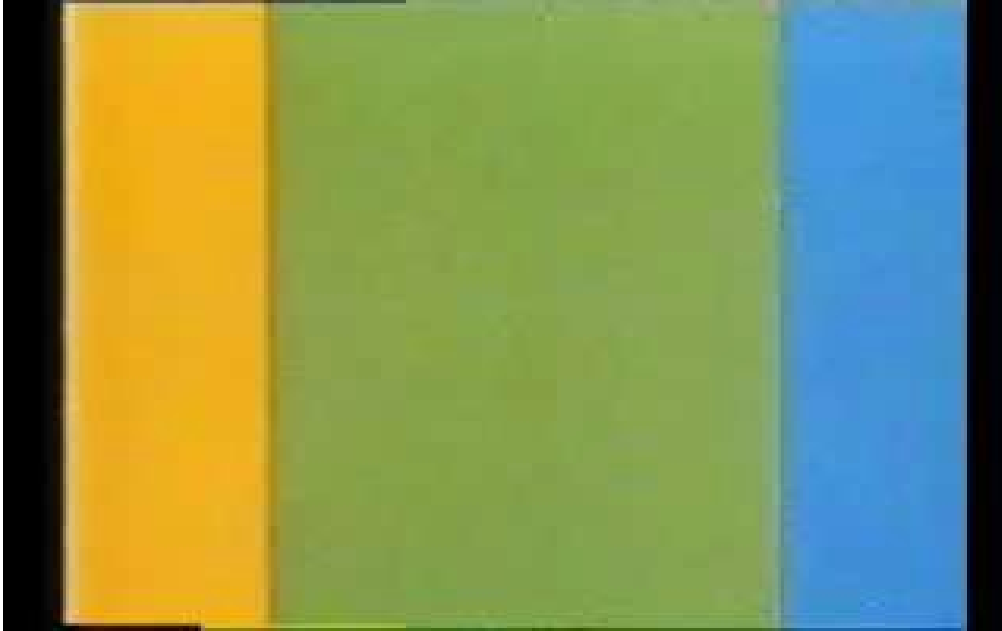


- **Optical source**
  - Semiconductor laser or LED**
- **Modulator**
  - Analog or digital**
  - Direct modulated source or external modulator**
- **Set of connectors or permanent fiber splice**
  - Join fiber lengths**
- **Repeater**
  - Electronically detect and regenerate signal**
- **Optical amplifier Amplify**
  - signal power**
- **Optical receiver (detector, preamp, logic circuits)**
  - Recover transmitted signal**

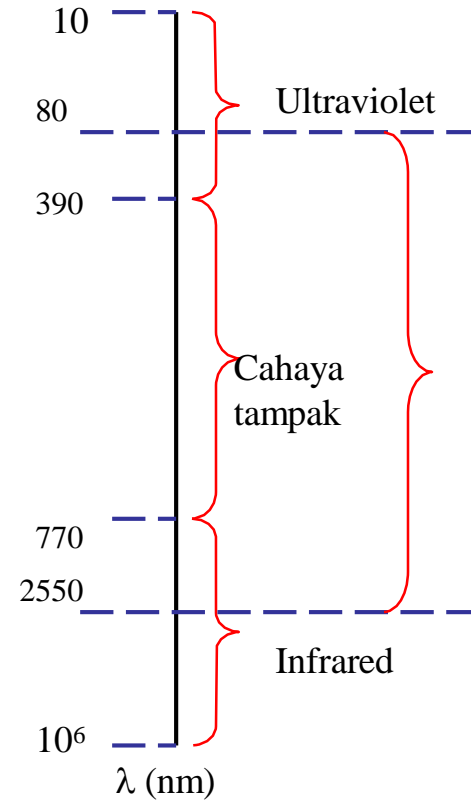
# Spektrum Frekuensi Optik



# Spektrum Frekuensi Optik



- Optik adalah gelombang elektromagnetik dengan frekuensi yang tinggi
- Ordennya  $10^{14}$  Hz



# Spektrum Frekuensi Optik

- Window Optik – range frekuensi optik dimana redaman serat optik paling rendah → range frekuensi ini yang digunakan sebagai carrier

↳ Window Pertama **800**

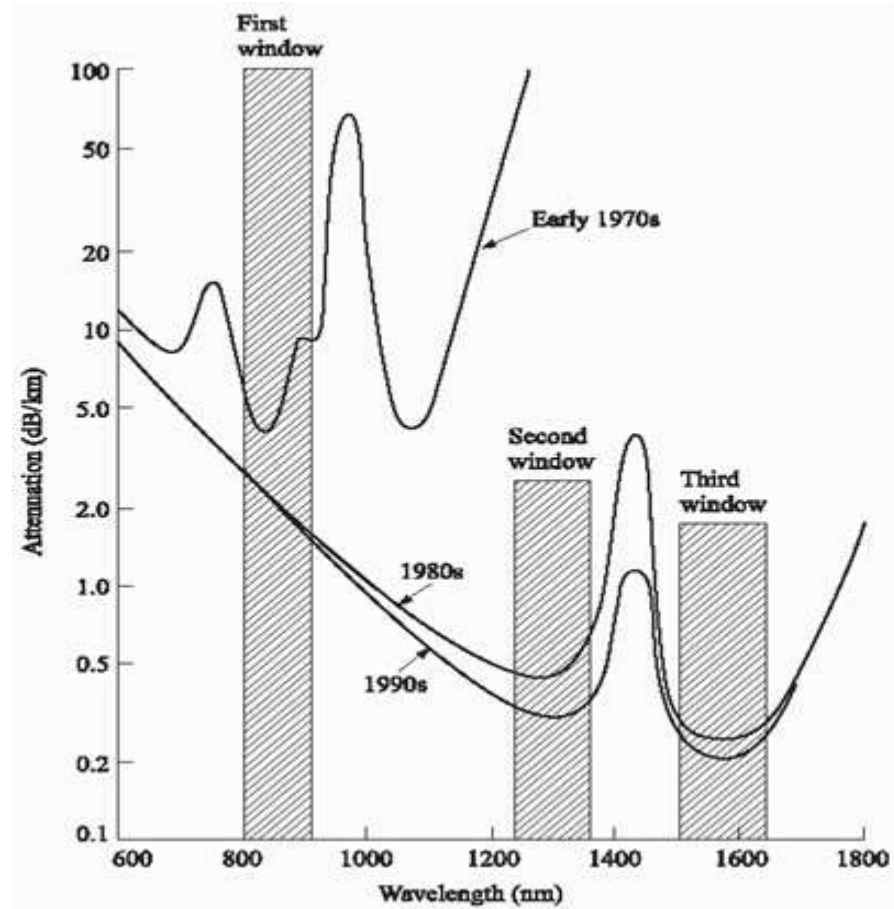
- **900 nm**

↳ Window Kedua

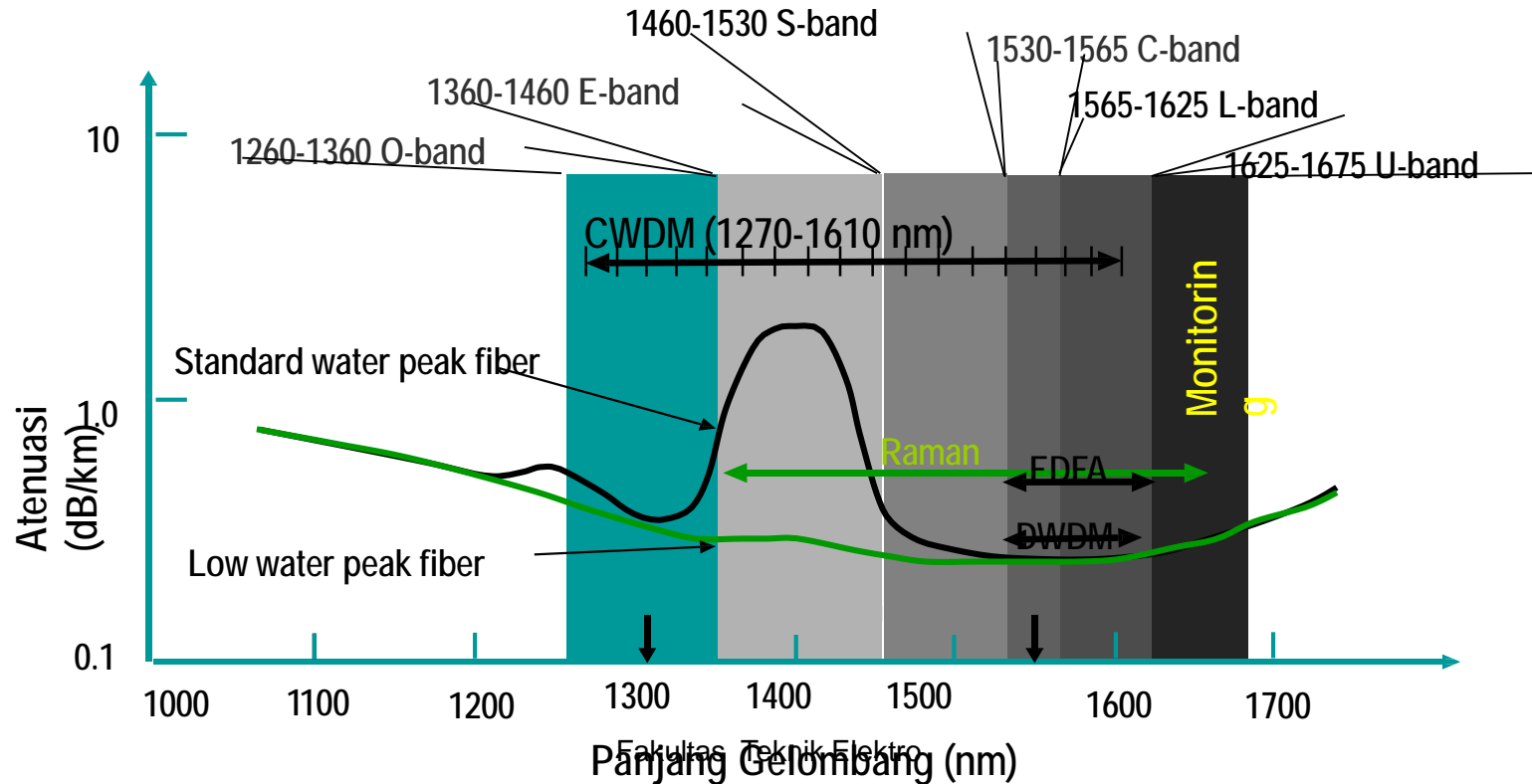
**1300 nm**

↳ Window Ketiga

**1550 nm**



# Spektrum frekuensi Optik



# DAFTAR NILAI

## SEMESTER GENAP REGULER TAHUN 2019/2020

Program Studi : Teknik Elektro S1  
Matakuliah : Sistem Komunikasi Serat Optik  
Kelas / Peserta : A  
Perkuliahan : Kampus ISTN Bumi Srengseng Indah  
Dosen : Djoko Suprijatmono, Ir., MT.

Hal. 1/1

No	NIM	N A M A	ABSEN	TUGAS	UTS	UAS	MODEL	PRESENTASI	NA	HURUF
			0%	0%	50%	50%	0%	0%		
1	15220009	<b>Fajar Ahmaddillah</b>	100	0	0	0	0	0	0	
2	16220008	<b>Ratna Febri Yanti</b>	100	0	70	70	0	0	70	<b>B</b>
3	16220016	<b>Lukman Haris</b>	100	0	70	70	0	0	70	<b>B</b>

Rekapitulasi Nilai							
A	0	B+	0	C+	0	D+	0
A-	0	B	2	C	0	D	0
		B-	0	C-	0	E	0

Jakarta, 5 September 2020

Dosen Pengajar

**Djoko Suprijatmono, Ir., MT.**