

PENDAHULUAN

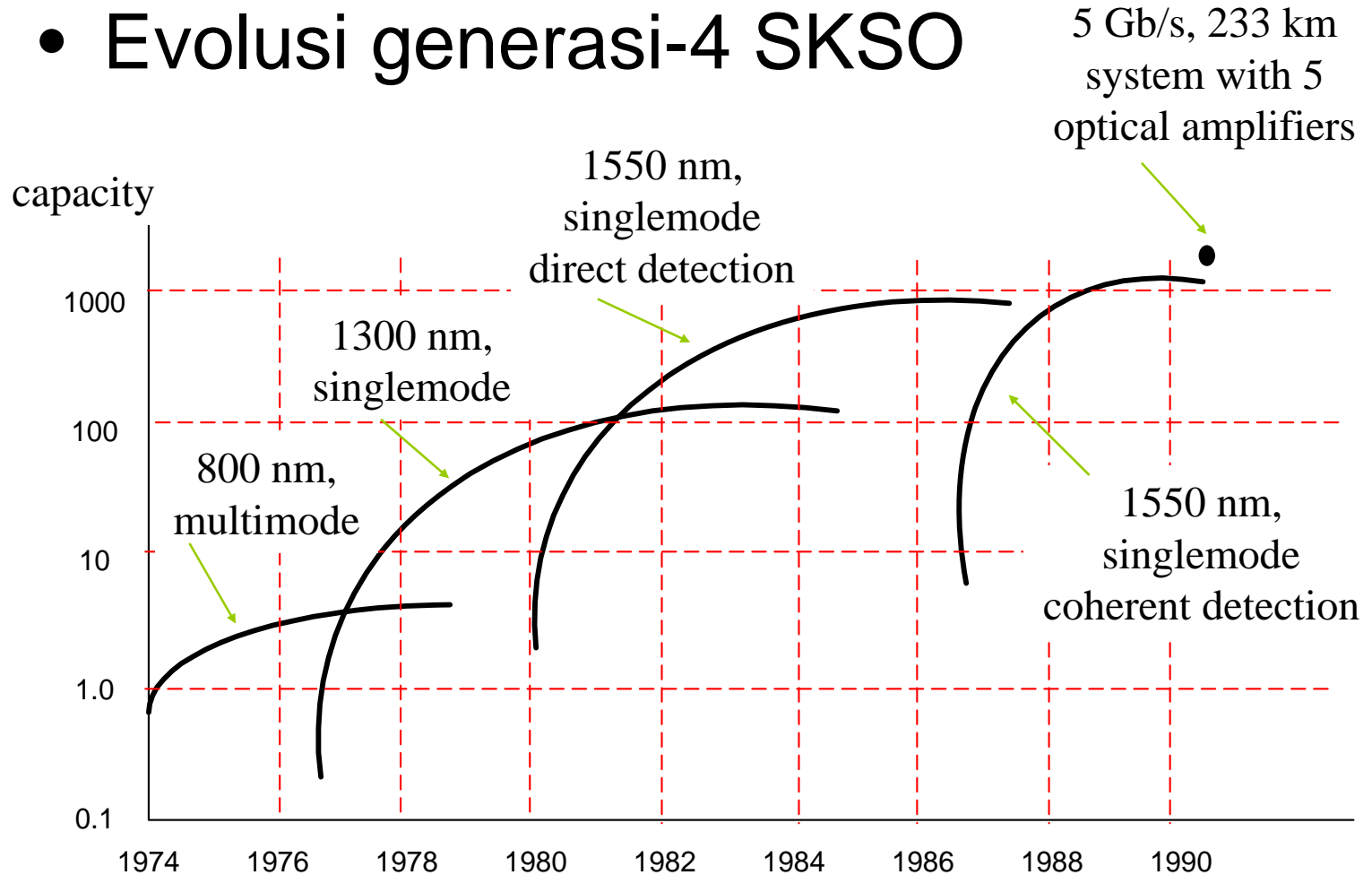
Sejarah siskom optik

- Komunikasi gerakan tangan, mata sebagai detektor dan otak sebagai prosesor
- Komunikasi dengan menggunakan asap
- Lampu → kedip-kedipkan sesuai informasi yang dikirim
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- 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

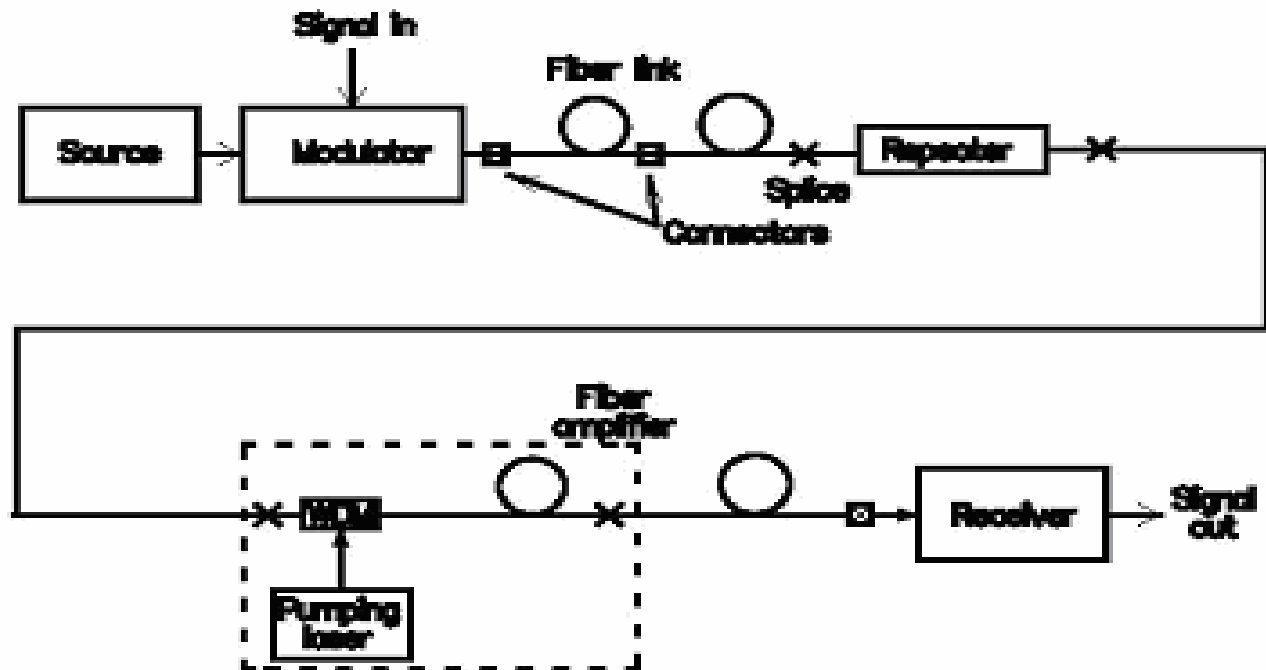


Perkembangan SKSO

- Evolusi generasi-4 SKSO



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**

Beberapa Pertimbangan Penting

- **Signal**
 - Analog or digital?
 - **Source:**
 - LED or laser? Wavelength?
 - Modulation format
 - » AM, FM for analog signals
 - » OOK, FSK, PSK for digital wave-form
 - Cost, reliability, output power level?
 - Temperature stability?
 - **Detector:**
 - Detector material (wavelength)?
 - Sensitivity?
 - Cost?
 - Temperature stability?
- **Fiber:**
 - Attenuation?
 - Bandwidth (single-mode or multimode)?
 - Distance?
 - Cabling strength members, power conductor, size, weight?
 - **Connectors and splices:**
 - Splices or connectors ?
 - Splice under operating conditions?
 - Keep out water or gases?
 - Etc., etc...

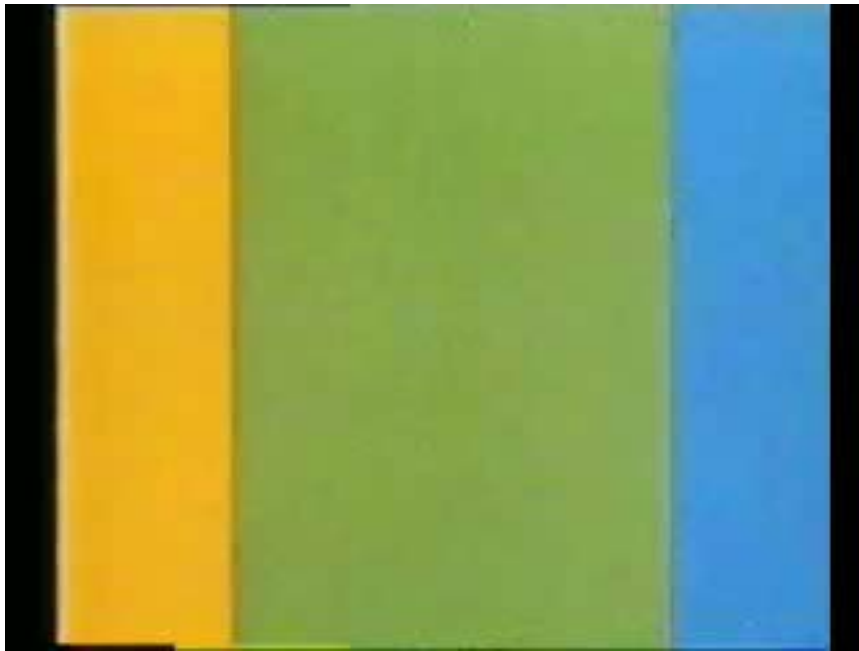
Kenapa memilih Fiber ?

- **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**

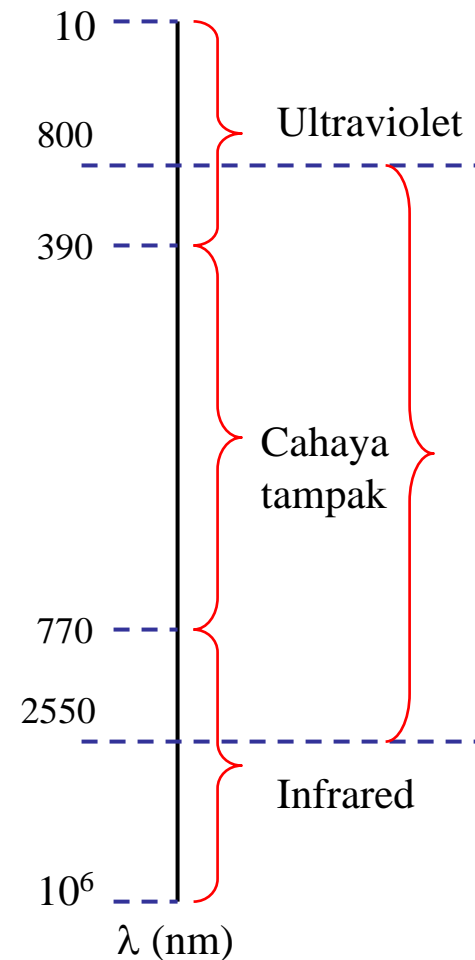
Pilihan selain Fiber ?

- **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**

Spektrum Frekuensi Optik



- Optik adalah gelombang elektromagnetik dengan frekuensi yang tinggi
- Ordenya 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

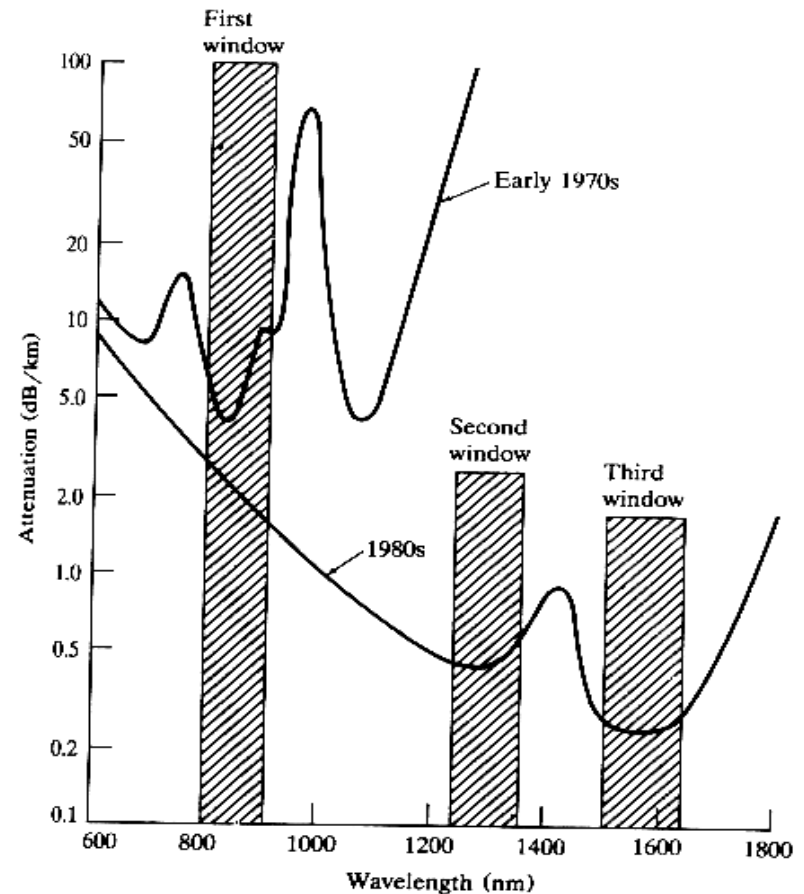
800 - 900 nm

↳ Window Kedua

1300 nm

↳ Window Ketiga

1550 nm



Spektrum frekuensi Optik

