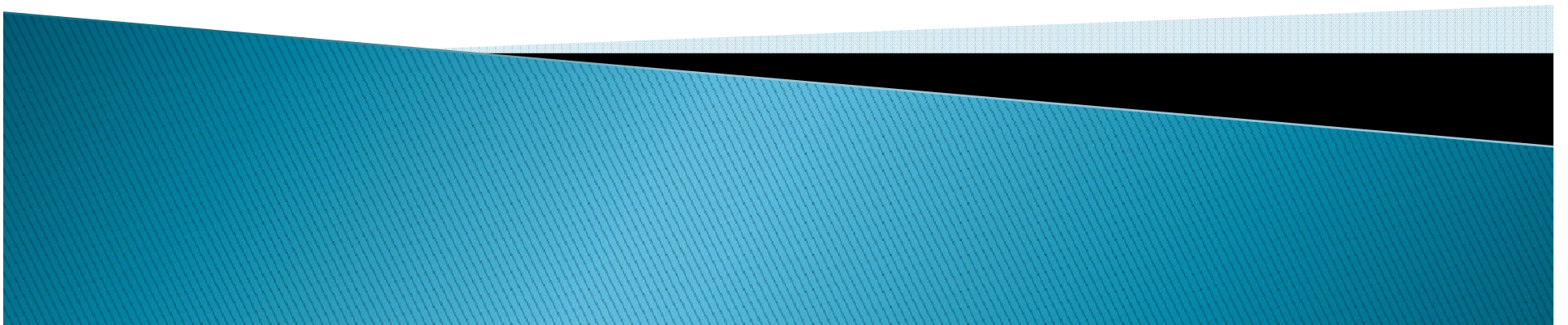
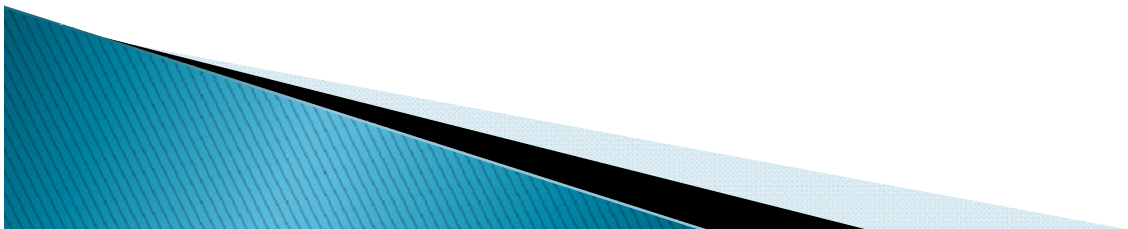


# OPTICAL COMM SYSTEM



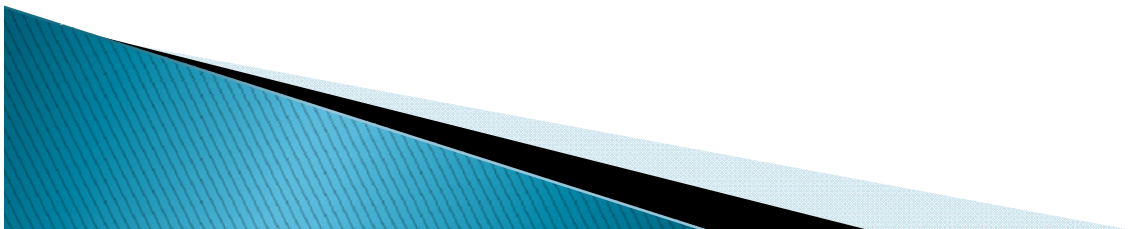
# OPT COMM SYSTEM

- ▶ COMMUNICATION AT OPTICAL FREQUENCIES OFFERS AN INCREASE IN THE POTENTIAL USABLE BW BY A FACTOR OF  $10^4$  OVER HIGH FREQUENCY MICROWAVE TRANSMISSION.

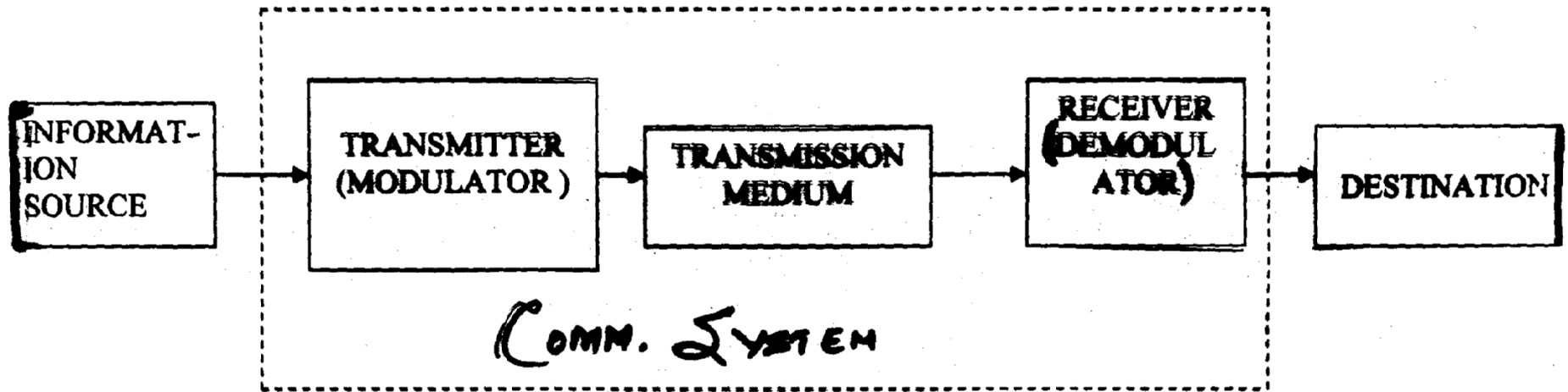


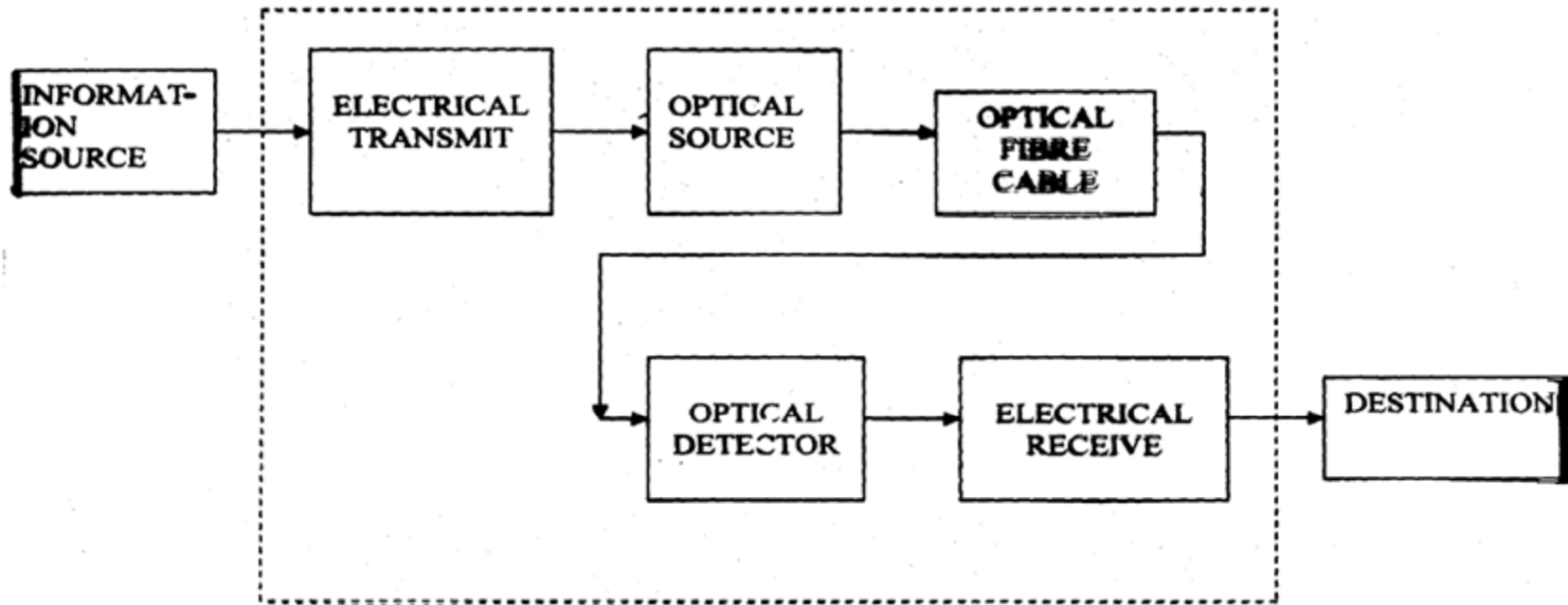
# Important.....

- **INFORMATION CARRYING CAPACITY IS RELATED TO BANDWIDTH OF THE MODULATED CARRIER WHICH IS GENERALLY LIMITED TO A FIXED FRACTION OF CARRIER FREQ.**
- **HIGHER THE CARRIER FREQ HIGHER IS THE AVAILABLE TX BW AND THUS THE INFORMATION CARRYING CAPACITY.**



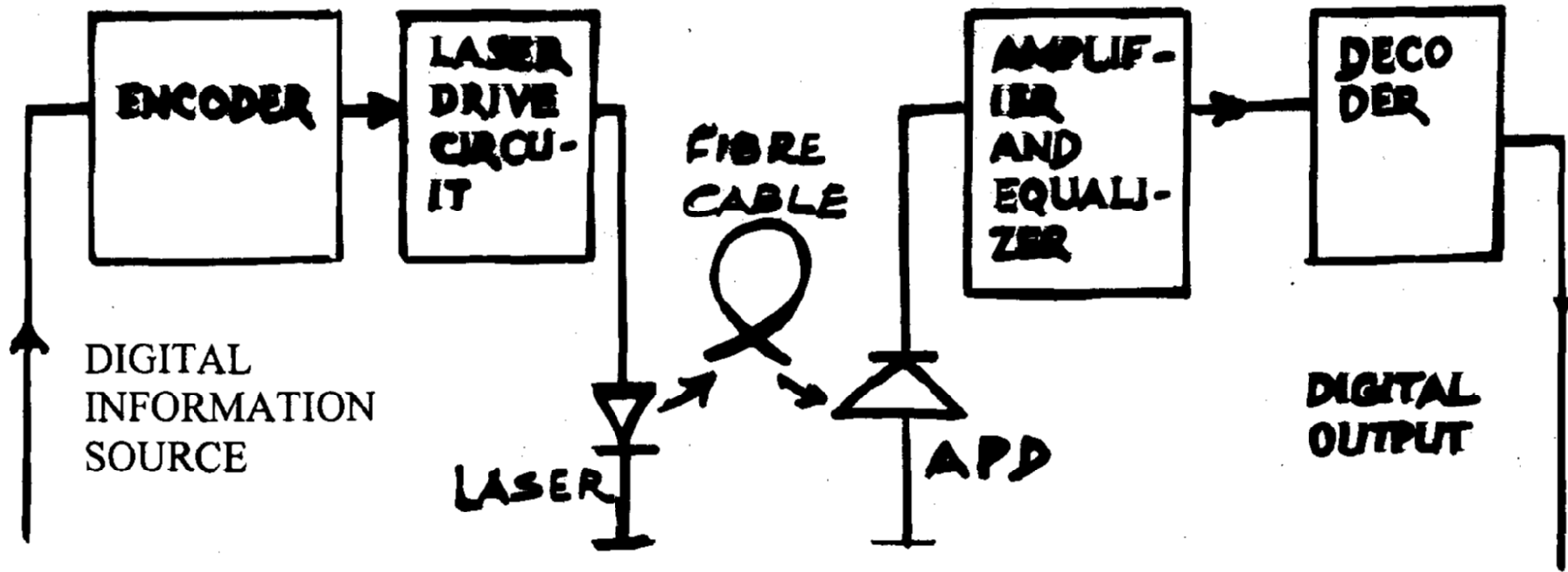
## BLOCK DIAGRAM - OFC SYSTEM





## **OPTICAL FIBRE COMMUNICATION SYSTEM**

# DIGITAL OPTICAL FIBRE LINK

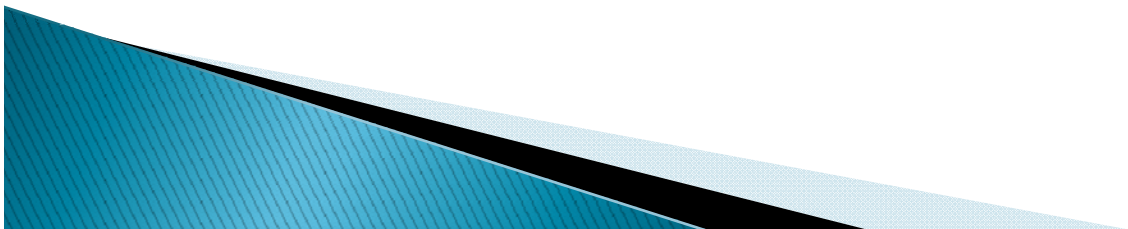


## DIGITAL OPT FIBER LINK (contd)

- IN ANALOG MODULATION LIGHT EMITTED BY OPTICAL SOURCE IS VARIED IN A CONTINUOUS MANNER.
- WITH DIGITAL MODULATION, DISCRETE CHANGES IN LIGHT INTENSITY ARE OBTAINED (ON-OFF PULSES).
- ANALOG MODULATION IS SIMPLER, EASIER TO IMPLEMENT, BUT IS LESS EFFICIENT AND REQUIRES HIGH S/N RATIO AT THE RECEIVER END.
- ACCORDINGLY ANALOG OFC LINKS ARE LIMITED TO SHORTER DISTANCES & LOWER BW THAN DIGITAL LINKS.

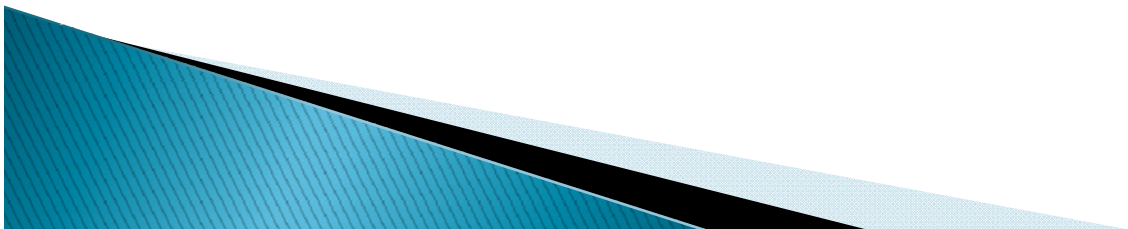
LASER DRIVE CIRCUIT: MODULATES THE INTENSITY OF SEMICONDUCTOR LASER WITH THE ENCODED DIGITAL SIGNAL.

AMP & EQUILIZER PROVIDES GAIN, LINEAR SIGNAL PROCESSING & NOISE BW REDUCTION




## ADVANTAGES OF OPTICAL FIBRE COMMUNICATION

- ENORMOUS POTENTIAL BANDWIDTH AS COMPARED TO COAXIAL CABLE BW (500 MHZ).
- THE INFORMATION CARRYING CAPACITY OF OFC IS FAR SUPERIOR (TO THE BEST COPPER CABLE SYSTEMS).
- ENHANCED BW PROVIDES THE OPPORTUNITY TO SEND SEVERAL SIGNALS IN PARALLEL ON THE SAME FIBRE  
(WAVELENGTH DIVISION MULTIPLEXED OPERATION)





## ADVNTAGES OF OPTICAL FIBRE COMMUNICATION

- SMALL SIZE & WEIGHT.(much lighter than copper cables)
  - ELECTRICAL ISOLATION.( no arcing or sparking )
  - FREE FROM EMI, RFI, ANY TRANSIENT PULSES AND CROSSTALK.
  - NOT SUSCEPTIBLE TO LIGHTNING STRIKES IF USED OVERHEAD.
  - PROVIDES HIGH DEGREE OF SIGNAL SECURITY.
  - LOW TRANSMISSION LOSS (0.2 dB/KM) AGAINST COAXIAL CABLE (5 TO 10 dB/KM). SO WIDE REPEATER SPACING
  - RUGGEDNESS AND FLEXIBILITY.
  - RELIABILITY & EASE OF MAINTENANCE.
  - POTENTIAL LOW COST.
- 

# THE ELECTROMAGNETIC SPECTRUM SHOWING THE REGION USED FOR OPTICAL FIBER COMMUNICATIONS.

