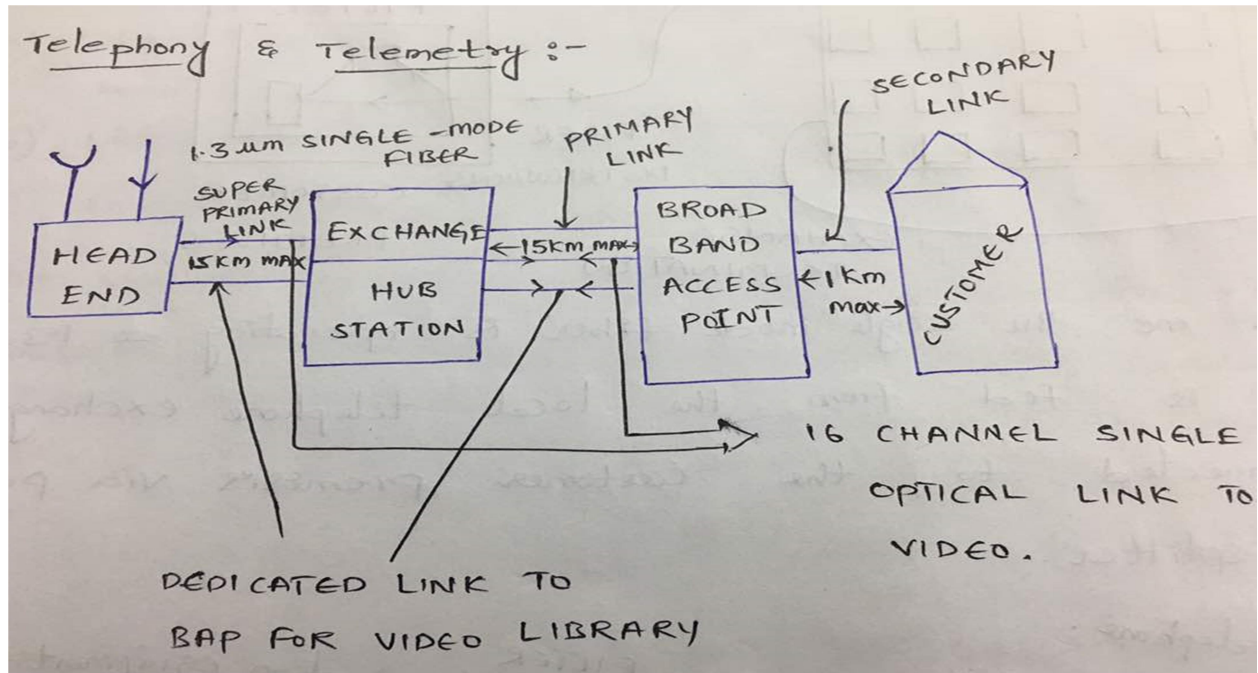


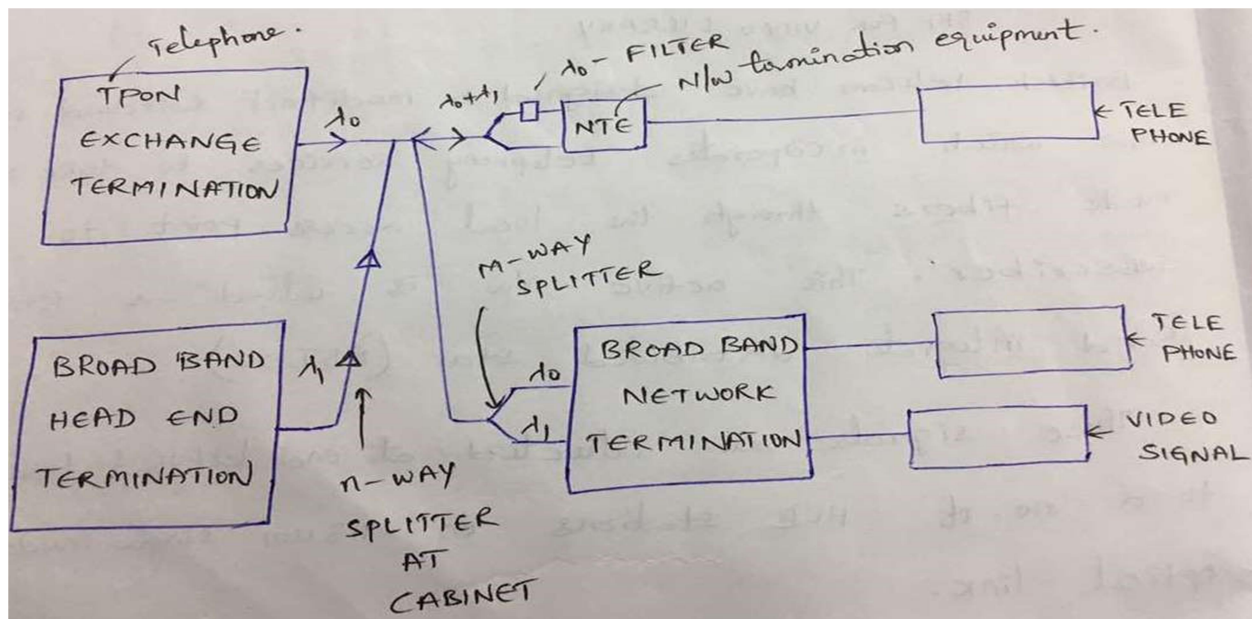
UNIT-V

OPTICAL COMMUNICATION APPLICATIONS

TELEPHONY & TELEMETRY:

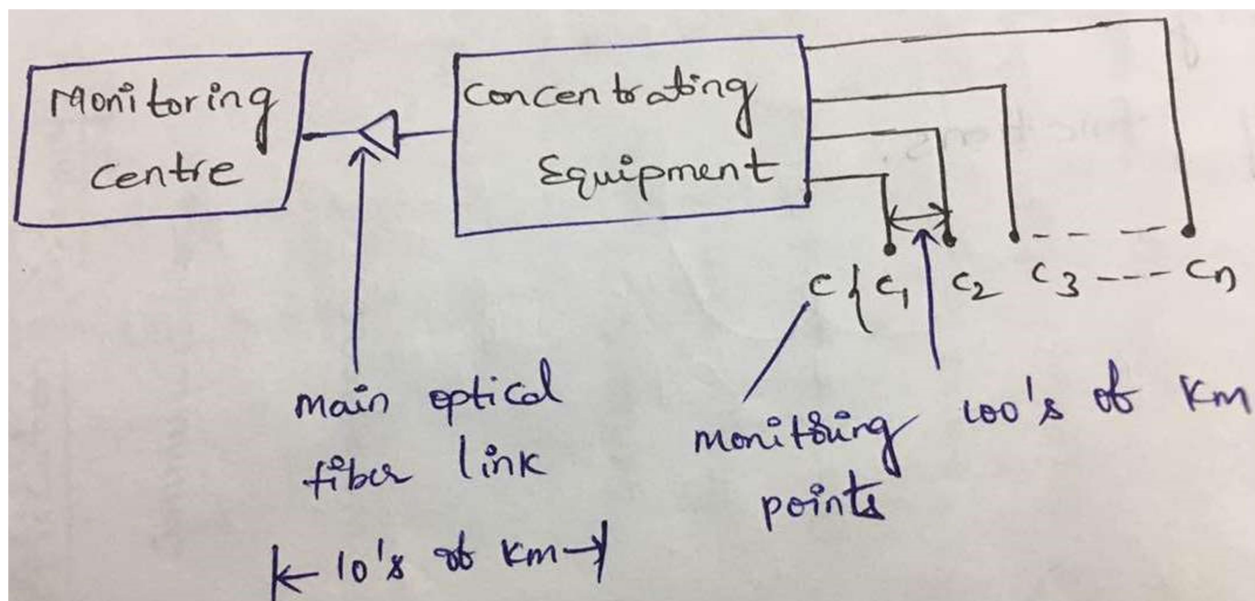


- BBIDS was developed by British telecom and modified as a switched star network which incorporates telephony services by using single mode fiber.
- The signals collected at the head end transmitted to number of Hub stations through single mode optical fiber.
- Each optical fiber is capable of carrying 16 TV channels. The signals are being transmitted at a rate of 140 Mbps.



- In the recent past various digital switching networks are developed to satisfy telephone and telegraph services.

VIDEO DISTRIBUTION:



The techniques used for video broadcasting are

- (1) Baseband intensity modulation
- (2) Sub-carrier intensity modulation

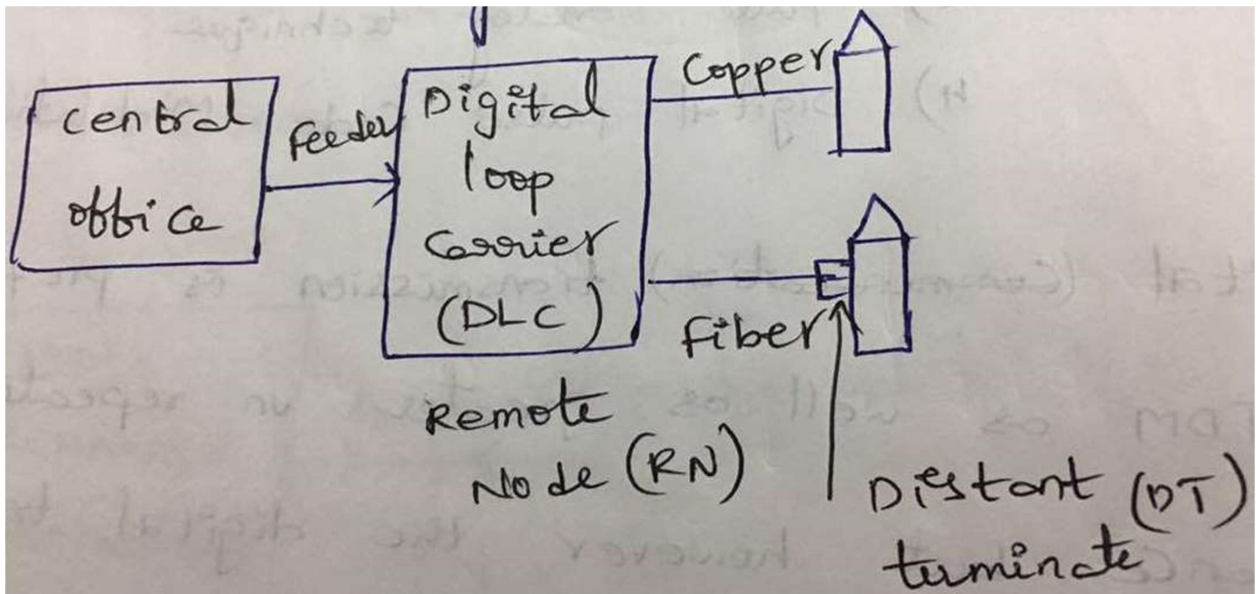
(3) Pulse-analog technique

(4) DPCM

Generally digital transmission is preferred, because it allows TDM with long distance transmission.

Implementation cost is less and less complexity.

The video signal from camera at monitoring point collected and given to the concentrating equipment.



In digital transmission Digital loop carrier (DLS) place a vital role

Because it provides

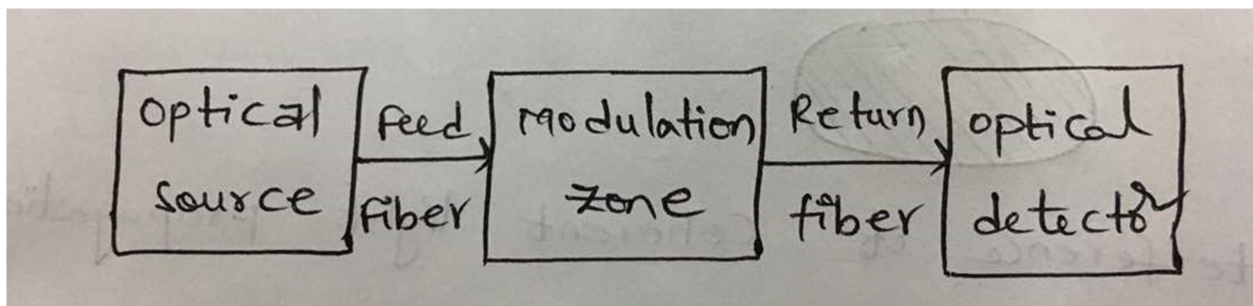
- (1) Suitable battery
- (2) over voltage protection
- (3) ringing
- (4) signaling
- (5) coding
- (6) testing function
- (7)

MILITARY APPLICATIONS:

Application Category	System	Benefits of Fiber
Communications	Intrusion Detection Optical Communications (IDOC) System	Allows nonencrypted system EMI/EMP immunity Improved security
Weapons	FOG-M AAWS-M FOG-S PDAMS	EMI/RFI immunity High data rate Reduced vulnerability of launcher
Sensors Nuclear testing	High pressure sensor	Ability to sense in particle generation phase Ranges in excess of 10 kbar Accurate tracking of impulses
Image probes	Combustor flame probes	Compactness Reliability Ability to withstand high temperature
Surveillance Submarine	Ariadne Program	Ability to hold up in corrosive sea environment High sensitivity
UAV	R&D stage	Covert operation EMI/EMP immunity
Airborne Platform Avionics	Fly-by-light system	EMP/EMI immunity Weight/space savings
Radar	Phased array	Weight savings Capability to exploit parallelism of array
Aircraft stress monitoring	R&D stage	Light weight Small size Facilitation of maintenance Real-time monitoring

Application Category	System	Benefits of Fiber
Optical computing	Neural networks	Massive parallelism
Shipboard	Information system Damage control system (in tandem with sensor network)	Weight/space savings Low cost EMI/RFI immunity Ability to hold up in corrosive sea environment High data rate No spark hazard Ability to service live cable
Navigation	Fiber optic gyroscope (FOG)	Small size Light weight Low power Ruggedness Potentially modest cost Potentially great accuracy

SENSORS:



Sensors are classified into two types

- (1) Active or intrinsic sensors
- (2) Passive or extrinsic sensors

(1) Active or intrinsic sensors:

In this type physical parameter to be sensed are acting directly on the fiber to the corresponding modulation in the transmitted physical parameters.

Based on modulation used the sensors are classified in to

- (a) Intensity modulated sensors
- (b) Phase modulated sensors
- (c) Polarization modulated sensors
- (d) Wavelength modulated sensors

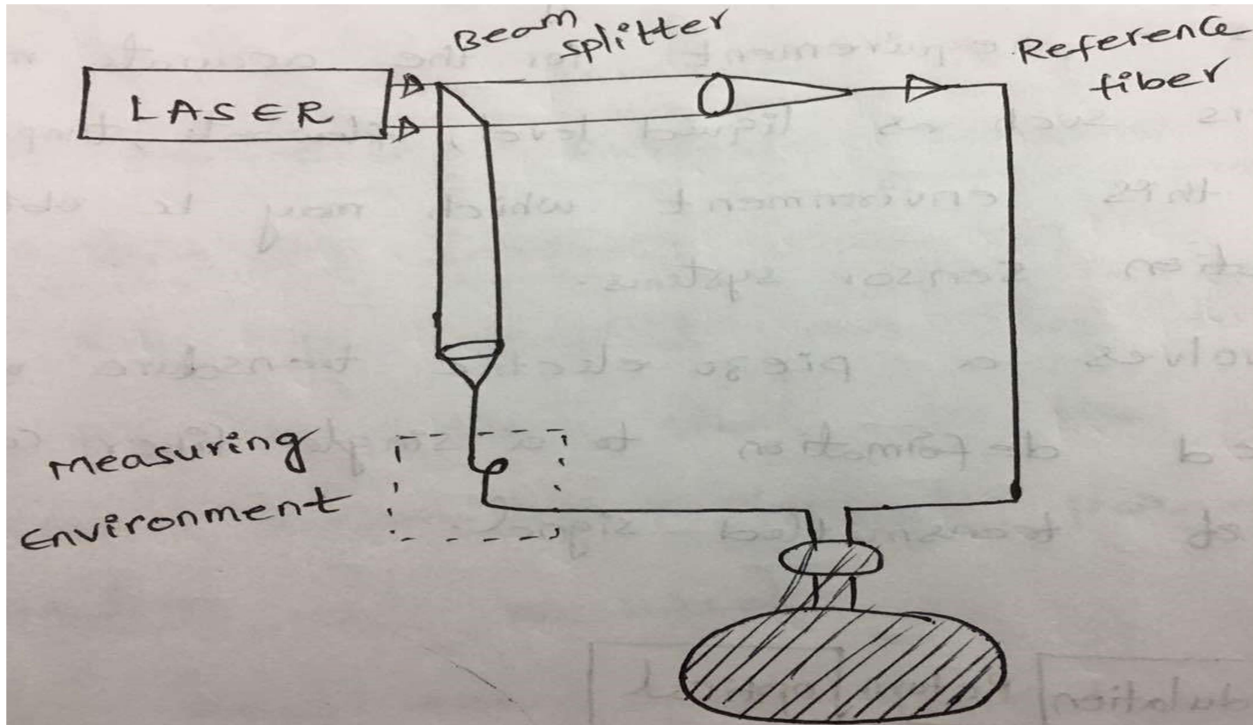
(2) Passive or extrinsic sensors:

In this separate sensing elements and optical fibers are used as guiding media.

The modulation of the light transmitted through the fiber is carried out externally either by induced or environmental changes. Thus the modulated signal is transmitted through a second fiber

In passive sensor the fibers are used only as a transmission media.

PHASE & POLARISATION SENSOR (MZI):



In this sensors interferometer plays a vital role to measure the physical parameter and directly calibrate on it.

The calibration of interferometer depends on measuring environment .

The effect of measuring environment (strain, temperature, pressure etc.) are sensed and send the information to the interferometer.

A common single mode fiber is used to connect light source, measuring environment and interferometer by the use of beam splitter.

The difference produces a phase shift which can measure by interferometric technique in order to obtain rotation.

Measurement based on comparison is also called as coherence measurement.