



# Summary of Undersea Fiber Optic Network Technology and Systems



By Adam Markow  
Senior Telecom Analyst

The source of many of the slides is from – The David Ross Group <http://www.davidrossgroup.com>



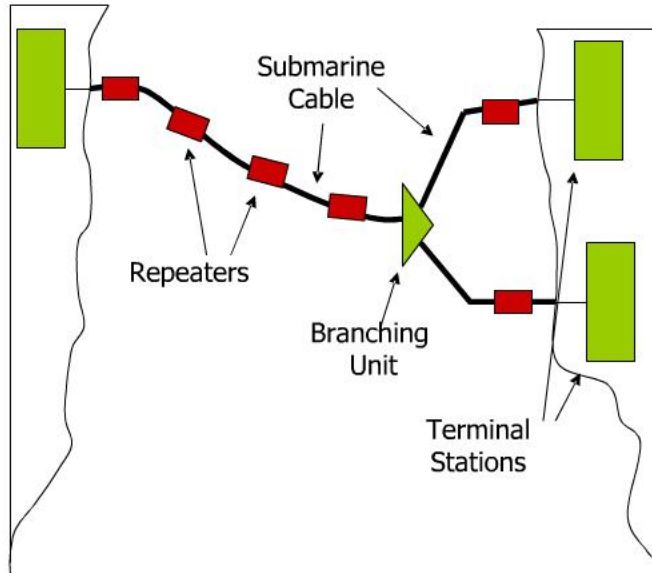
# A view of the Global Submarine Cable Network (TeleGeography)



# Undersea System Elements

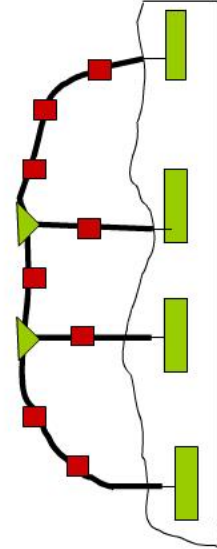
## *Repeated Examples*

### Transoceanic Network



### Coastal Network

Using the same elements



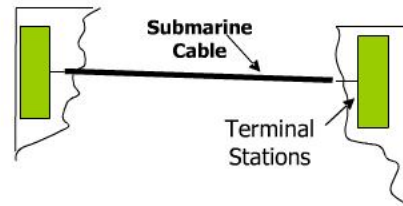
## **Repeaterless vs. Repeatered:**

- Limited to <400 km span lengths
- Sometimes, but not always
  - Less expensive initially
  - More flexible long term
  - Less expensive to operate & maintain
  - More complex to upgrade
- Historical advantages of repeaterless offset today by current market oversupply of repeatered production capability and inventory

*The choice between repeatered & repeaterless must be made on a case by case basis*

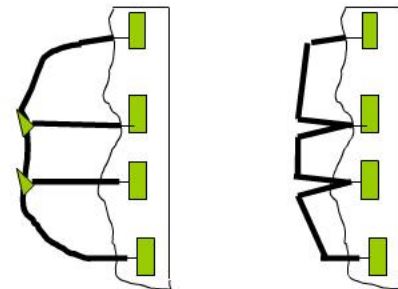
Source – The David Ross Group  
<http://www.davidrossgroup.com>

## Inter-island Network



## Coastal Networks

Using the same elements

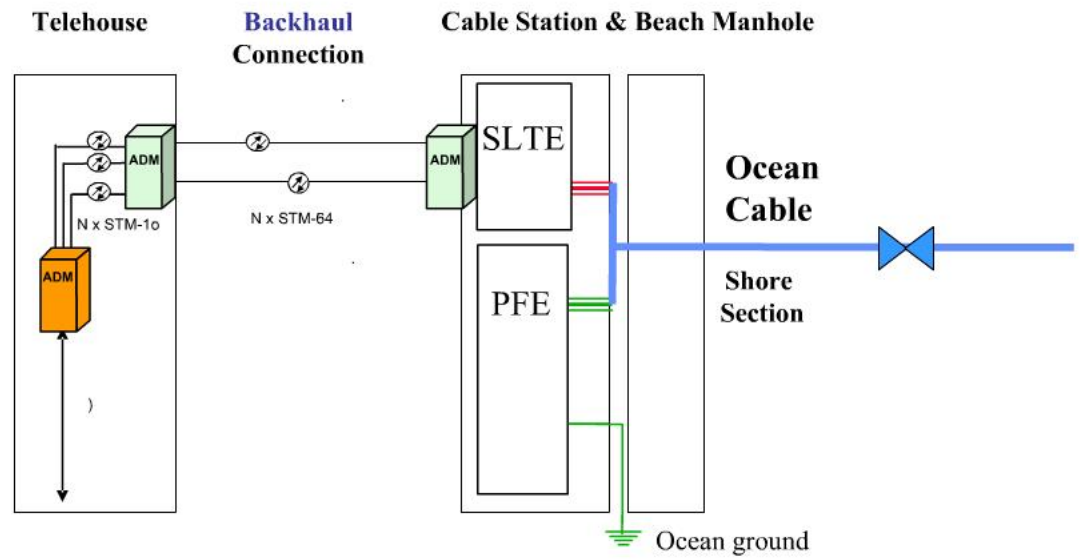


Trunk & Branch

Festoon



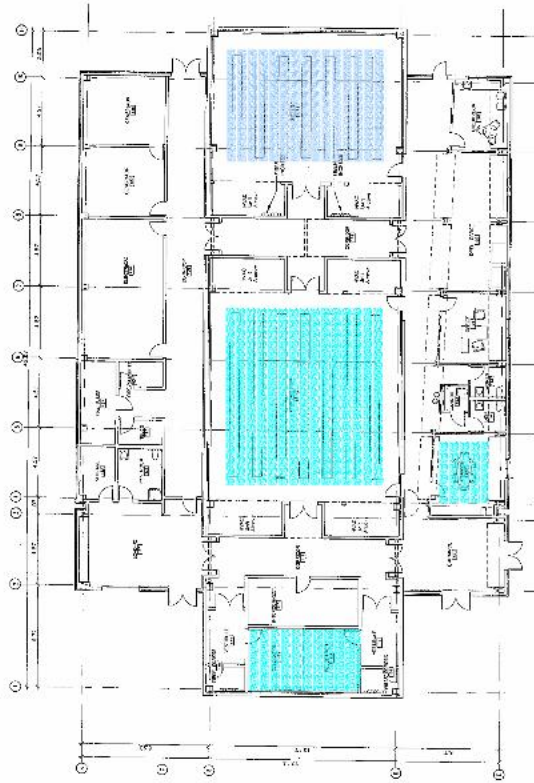
# Connecting a Terrestrial Network with an Undersea System



SLTE – Submarine Line Termination Equipment.

PFE – Power Feed Equipment (pushes constant current of ~1.5 A across undersea cable link from CS to CS)

# Cable Station Floor Plan



## GCL Cable Station Requirements:

**At least 17,000 square feet (~1900m<sup>2</sup>) of total area**

Raised floor, with minimum load tolerance of 500 kg/m<sup>2</sup>

Useable height of at least 2.5m

Dual cable vaults

DC -48v power, with battery backup for at least 1 hour.

Diesel Engine emergency backup

HVAC to maintain room temperature between 22 - 24C

Ring Ground

Fire/smoke detection, with connection to emergency/control center

**24 hour access for maintenance and repair**

**Battery**

**Transmission Equipment**

**Collocation for backhaul**

**Meeting/training room**

# Cable Station Transmission Components

