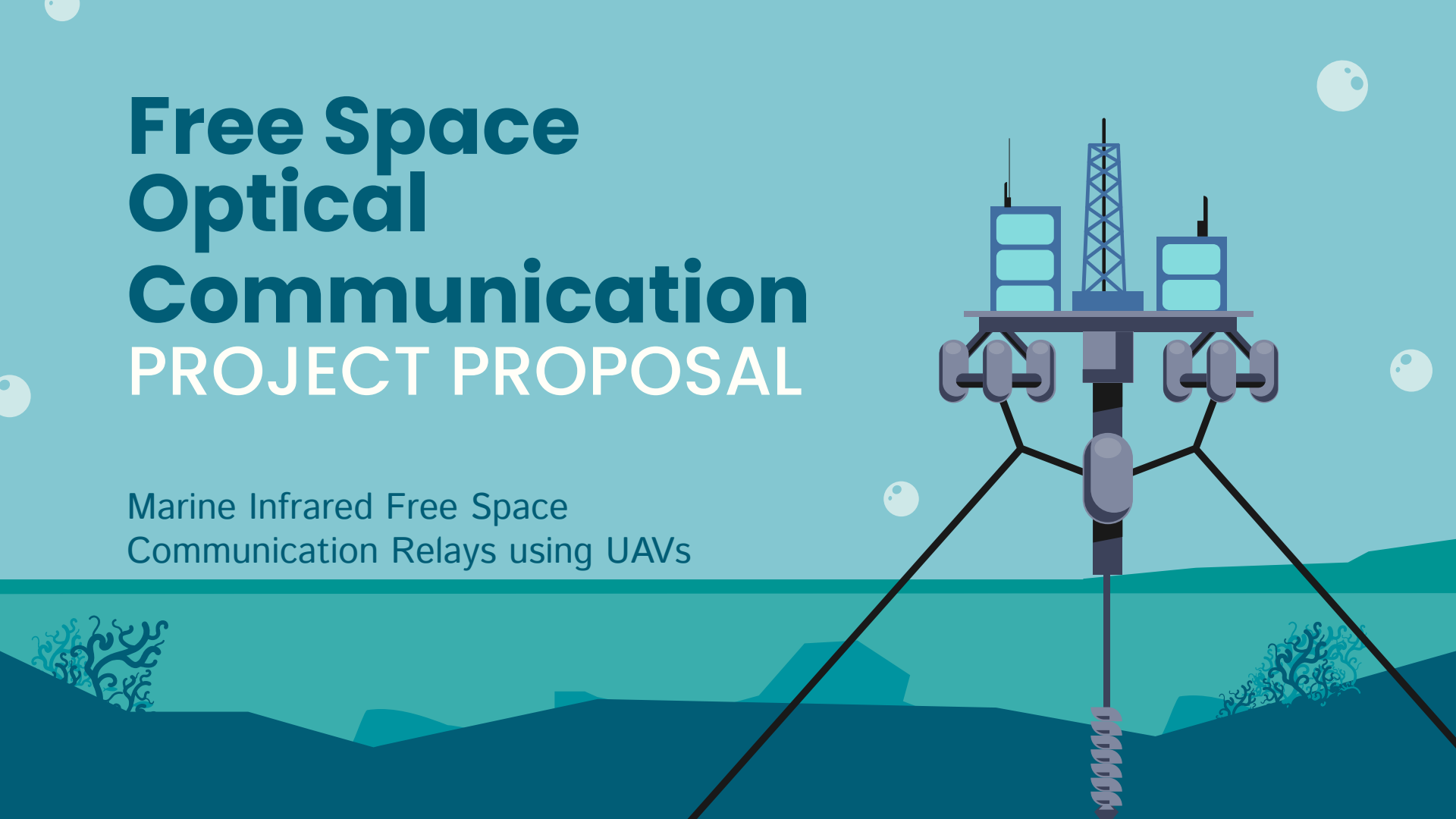
Free Space Optical Communication
PROJECT PROPOSAL

Marine Infrared Free Space
Communication Relays using UAVs



Terminology

Free Space Optical Communication: Turn lasers on/off to represent bits, operating in GHz range

Infrared: Near optical light wavelengths

UAVs: Unmanned Aerial Vehicles (drones)

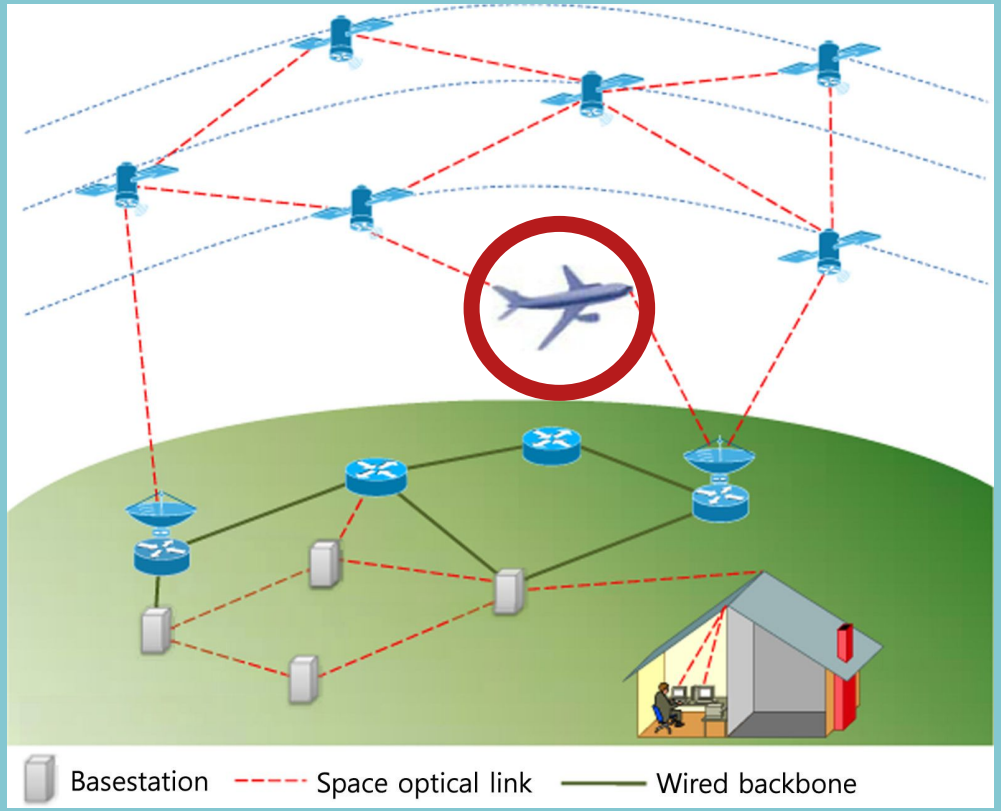
FANET: Flying ad hoc Network

Buckle Up

https://d37iyw84027v1q.cloudfront.net/na/bradyid/BradyID_Large/124463.jpg

https://images.wsj.net/im-159769?width=1280&size=1

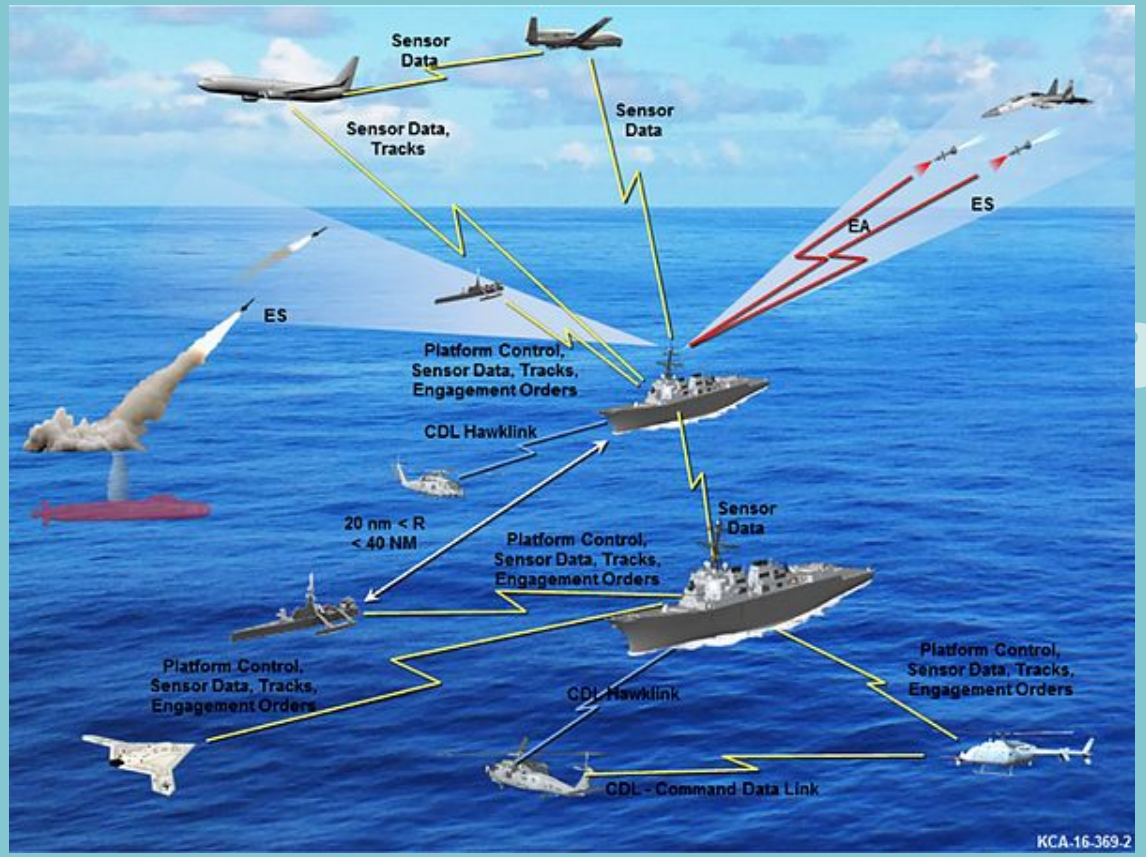
What?



Source: Keun Son, Shiwen Mao, 'A Survey of Free Space Optical Networks" in *Digital Communications and Networks,* pg 67-77. https://doi.org/10.1016/j.dcan.2016.11.002.

Red circle added for clarity

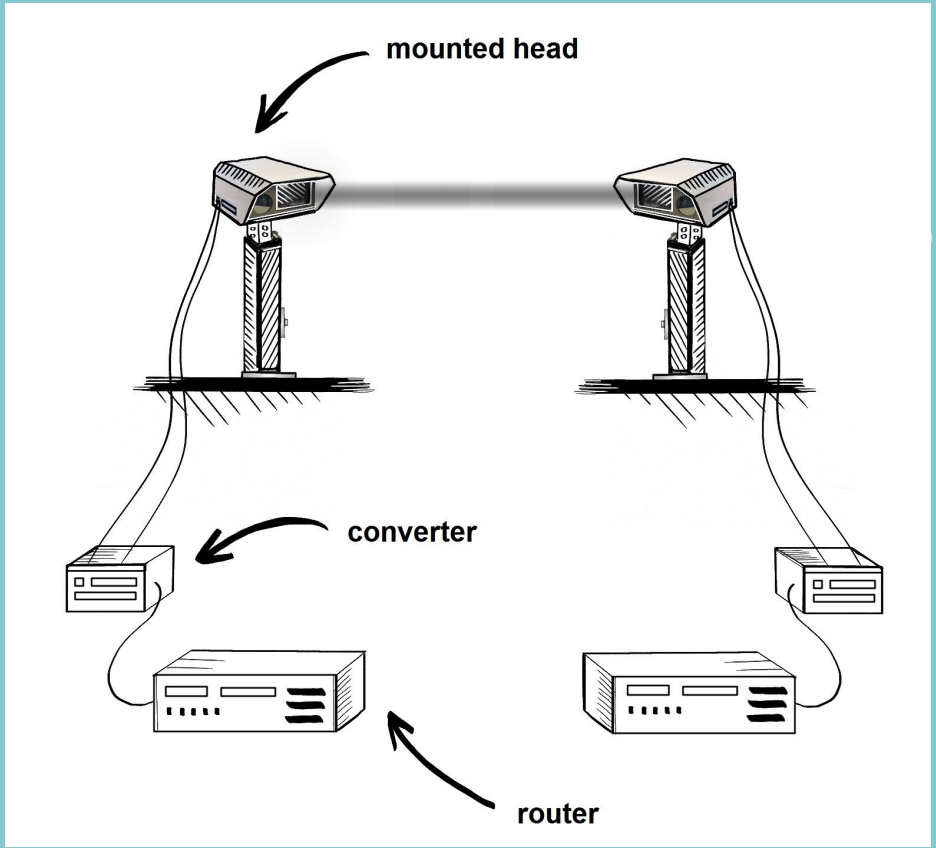
Why



https://www.afcea.org/content/?q=Article-us-navy-runs-interference-signals-conflict

Project Scope

1. Novel SATA 10GHz setup
2. New motorized scanning system
3. 10GHz testing system
4. Control System
5. Homing laser
6. Hardware construction
    a. Transceiver
    b. Control System
    c. Redesign of media converter



https://encyclopedia.pub/3726

Timeline

TASK	ASSIGNED TO	PROGRESS	START	END
Research and Development				
Static Design	Both	100%	9/12/21	9/15/21
Order parts	Ian	50%	9/15/21	10/1/21
Scanner Design	Both	0%	12/3/21	12/10/21
Tracking Algorithm	Both	0%	2/11/22	2/16/22
FANET Design	Both	0%	5/25/22	5/27/22
Static Design				
Construct Transmitter	Ian	0%	10/1/21	11/12/21
Construct Receiver	Natalia	0%	10/1/21	11/12/21
Lab Condition Testing	Both	0%	11/12/21	11/19/21
Foggy Condition Testing	Ian	0%	11/19/21	11/26/21
Outdoor Testing	Natalia	0%	11/26/21	12/3/21
Single Motion Design				
Scanner Parts Ordering	Natalia	0%	12/10/21	12/15/21
Construct Scanner	Both	0%	1/10/22	1/17/22
Test Scanner	Natalia	0%	1/17/22	1/24/22
Scanner Tracking Implementation	Ian	0%	1/17/22	1/31/22
One way tracking testing	Both	0%	1/31/22	2/10/22
Dual Motion Design				
Mount receiver on drone	Natalia	0%	2/10/22	2/17/22
Test drone receiver while moving	Natalia	0%	2/17/22	3/10/22
Mount transmitter on drone	Ian	0%	2/10/22	2/17/22
Test drone transmitter while moving	Ian	0%	2/17/22	3/10/22
Test drone-to-drone communication	Both	0%	3/10/22	4/14/22
Demonstrate FANET feasbility	Both	0%	4/14/22	4/21/22

The Team

Questions ?