



Naval Communications

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CANADIAN
ARMED FORCES



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SENIOR NAVAL COMMUNICATOR

- MANAGE AND OPERATE ALL FORMS OF COMMUNICATION ABOARD OPERATIONAL HMC SHIPS
- MAINTAIN COMPLIANCE WITH MANDATED SECURITY POLICY IAW NATIONAL DEFENCE SECURITY ORDERS AND DIRECTIVES (NDSOD'S)
- ADVISE COMMAND ON COMMUNICATIONS CAPABILITIES AND PROVIDE AGILE SOLUTIONS WHEN ECE CHALLENGES ARISE
- MANAGE AND EMPLOY NAVAL COMMUNICATIONS SECTION
- INFORMATION SYSTEMS SECURITY AND ADMINISTRATION
- COMMUNICATIONS SECURITY
- SATCOM ACCESS
- SPECTRUM MANAGEMENT

TYPES OF COMMUNICATION

- INTERNAL COMMUNICATIONS
- EXTERNAL COMMUNICATIONS
- VISUAL COMMUNICATION

INTERNAL COMMUNICATIONS

- SHINCOM (CSE DEPARTMENT)
 - RACOM/CRACOM Cardsets
- ShipLAN/SecLAN/MT WAN 1 & 2
 - Network Infrastructure
 - Active Directory
 - Virtualization
 - TTC
- CIDR/LAYER 3
- LEO for WIFI

EXTERNAL COMMUNICATIONS

- **LEGACY SYSTEMS**

- VULOS
- HF VOICE
- HF BROADCAST
- RADIO TELETYPE (RATT S/S)

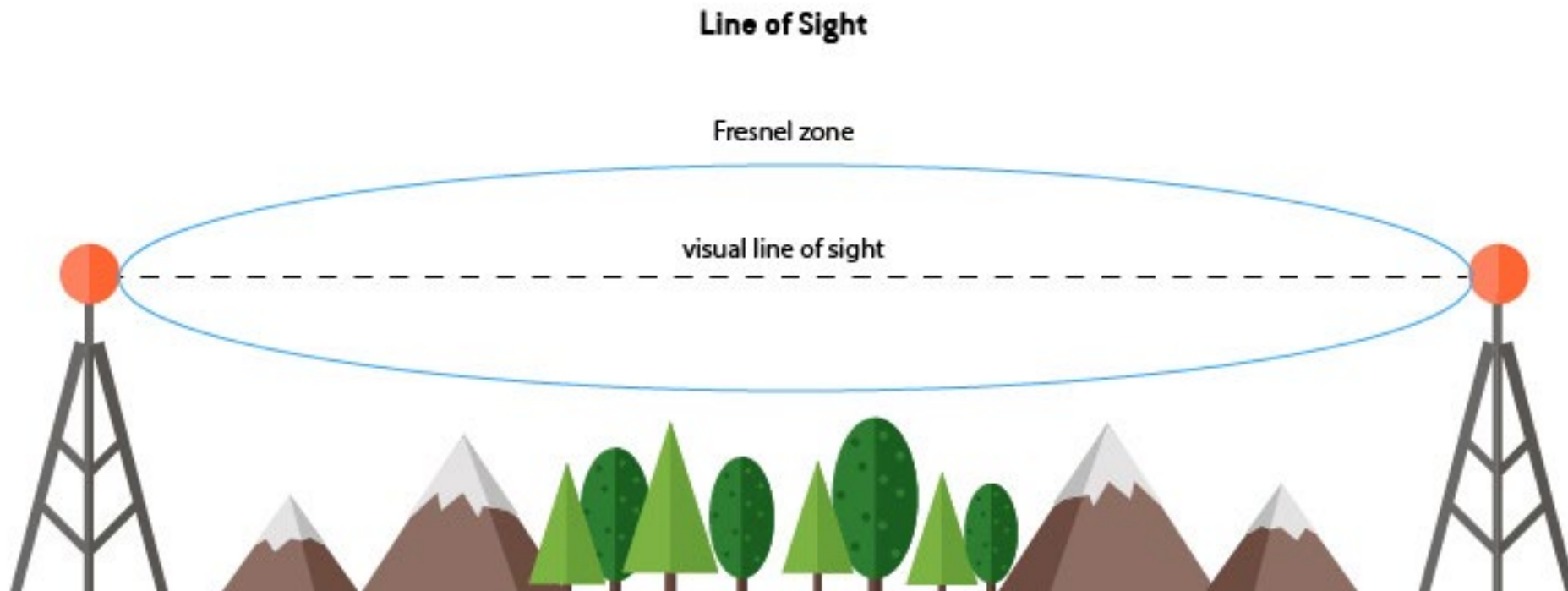
- **MODERN SYSTEMS**

- HSDC – WGS, PMSC
- DEDICATED SATCOM – UFO, MUOS
- TACTICAL COMMUNICATIONS, FREQUENCY HOPPING, MANETS & ISR
- LEO SERVICES/IRIDIUM/NORTAC

LEGACY SYSTEM - VULOS

WHAT IS VULOS?

VHF UHF LINE OF SIGHT



VHF LOS



UHF LOS



LEGACY SYSTEMS – HF RADIO

- EMPLOYED FFN
- ARCHAIC CUMBERSOME TECH
- EFFECTIVE FOR BLOS
- VOICE
- BROADCAST
- TELETYPE

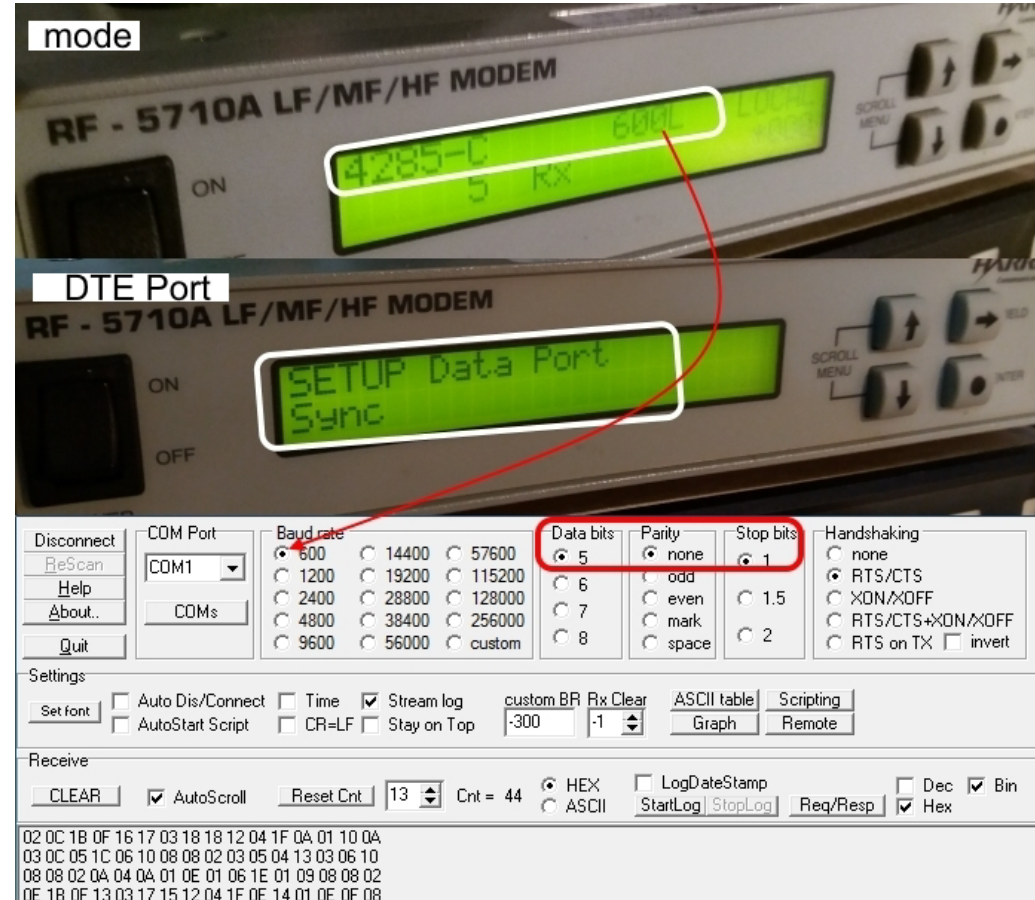
HF RADIO EQUIPMENT



HF RADIO EQUIPMENT



HF EQUIPMENT



MODERN SYSTEMS - HSDC



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HSDC CONSTELLATIONS

- WGS
- PMSC
- INMARSAT

WIDEBAND GLOBAL SATELLITE CONSTELLATION

- X BAND 8 – 12 Ghz
- Ku BAND 12 – 18 Ghz
- Ka BAND 26.5 – 40 Ghz
- REDUNDANCY IF EQUIPPED WITH MULTIPLE TERMINALS
- LAN PATHS ALTERED DEPENDING ON ECU
- BANDWIDTH

PROTECTED MILITARY SATELLITE COMMUNICATIONS AEHF/Q BAND

- CONFIDENTIAL
- 33 – 50 Ghz
- LIMITED BANDWIDTH
- OTO FUNCTION
- VOICE

DEDICATED SATCOM

- UFO CONSTELLATION
- MUOS

UFO – UHF FOLLOW ON CONSTELLATION

- SATELLITE CONSTELLATION USED FOR NARROWBAND MILSATCOM
- OP CARIBBE
- SECURE VOICE
- LARGE FOOTPRINT BLOS
- DATA SERVICES – TTY, BROADCAST ETC

MUOS – MOBILE USER OBJECTIVE SYSTEM

- Department of Defense's next generation UHF satellite communication system.
- MUOS provides greater system capacity in number of users and data rates to the warfighter as compared to existing Satellite Communications (SATCOM) waveforms.
- Maintains connectivity to the MUOS network when traveling between beams either within a satellite footprint or between two different satellite footprints
- Data rates = 9.6, 32, 64 kbps
- Voice Support
 - MELPe Vocoder, 2.4 kbps (Conversational)
 - G.729ab Vocoder, 9.6 kbps (Recognition)

TACTIAL COMMUNICATIONS – MULTIBAND RADIOS

- FREQUENCY HOPPING
 - HAVEQUICK 2
 - SATURN
- IMPLEMENTATION OF TACTICAL MANETS
 - ANW2C
 - TSM
- ISR

MULTIBAND RADIOS



MULTIBAND RADIOS



FREQUENCY HOPPING – HAVEQUICK 2

- INTRODUCED 1980 AS 1970S SHOWED COMMUNICATIONS COULD BE INTERCEPTED
- MODERNIZED INTO HAVEQUICK 2
- FREQUENCY HOPPING
- SWOD
- MWOD
- FMT
- SYNCHRONIZED CLOCKS GPS
- GUARD FREQS

FREQUENCY HOPPING - SATURN

- FAST FREQUENCY HOPPING
- 40 FREQUENCIES
- 100 HOPS A SECOND
- EXTREMELY RESILIENT
- WORKS LIKE HAVEQUICK 2

TACTICAL MANETS

- MANET
- WIRELESS NETWORKING
- LAYER 2 AND LAYER 3 DEPENDING ON WAVEFORM
- ANW2C
- TSM
- REAL TIME SHARING OF VIDEO, PICTURES
- ISR FEEDS
- CHAT SERVICES
- SIMULTANEOUS ENCRYPTED VOICE

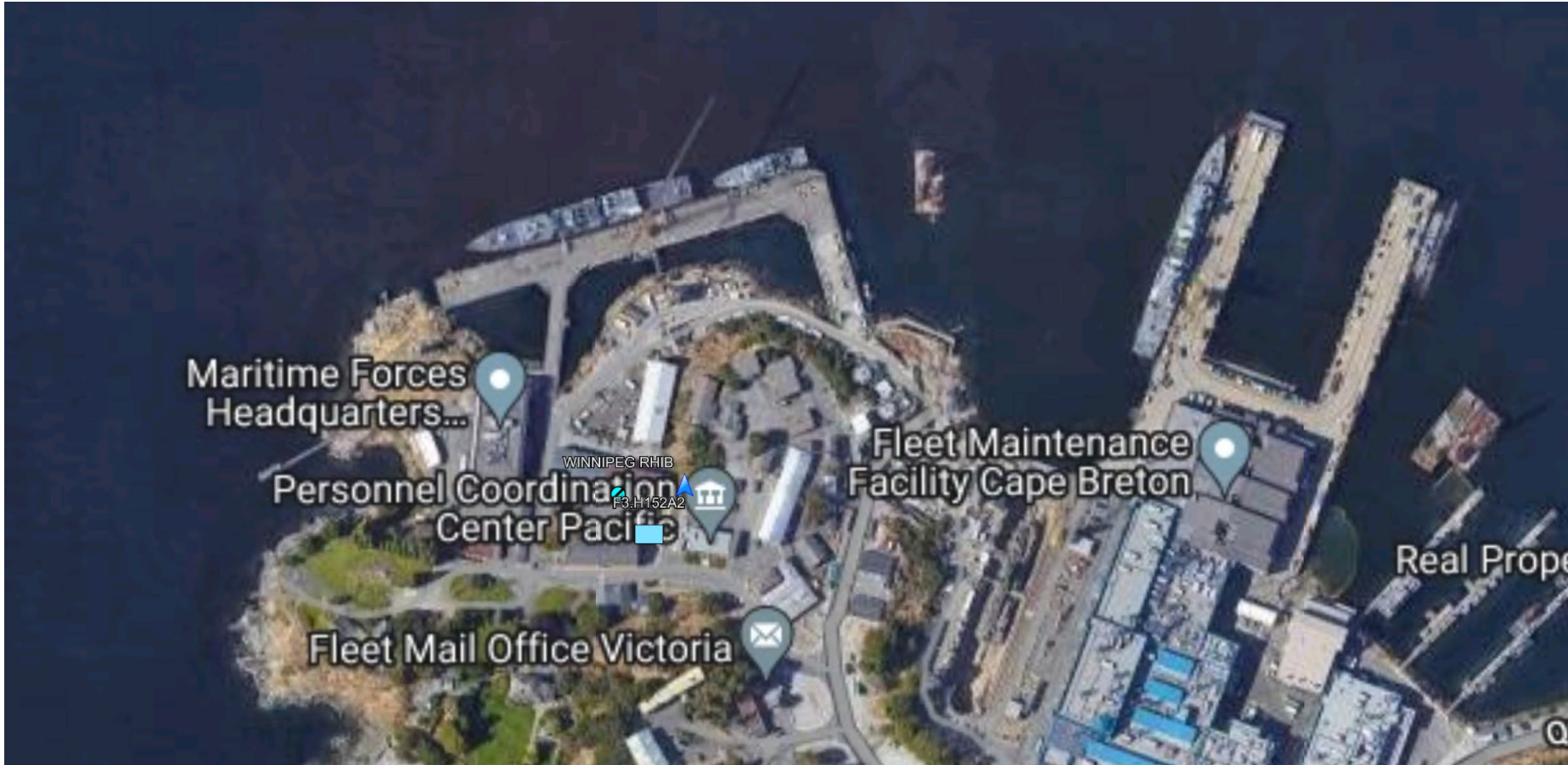
COMMAND AND CONTROL IN THE BATTLESPACE

- APPLICATIONS FOR SMARTPHONES/TABLETS/LAPTOPS
- WINTAK
- ATAK
- ITAK

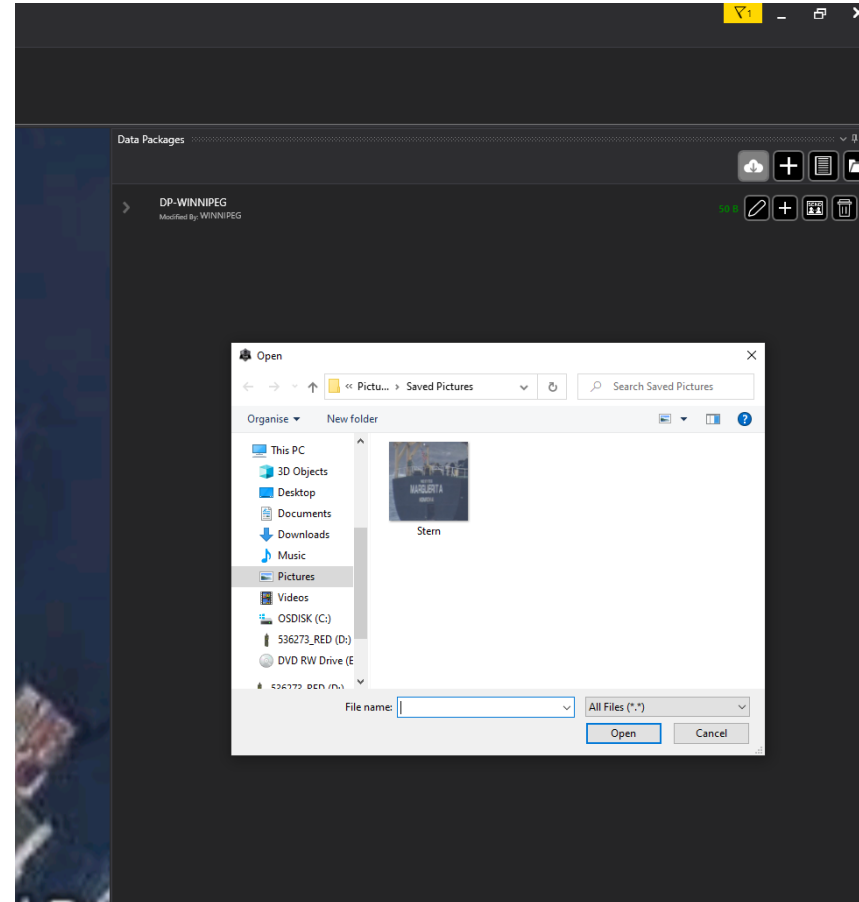
WINTAK



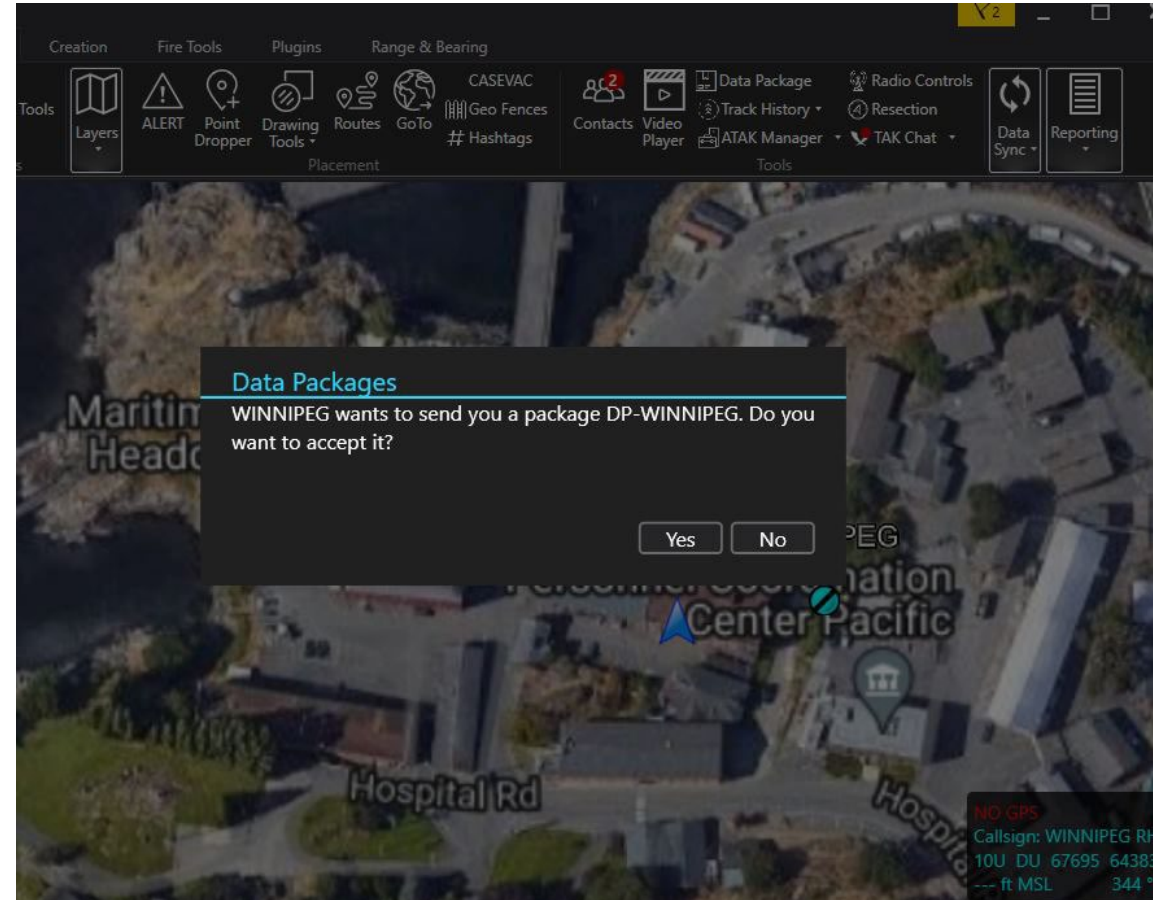
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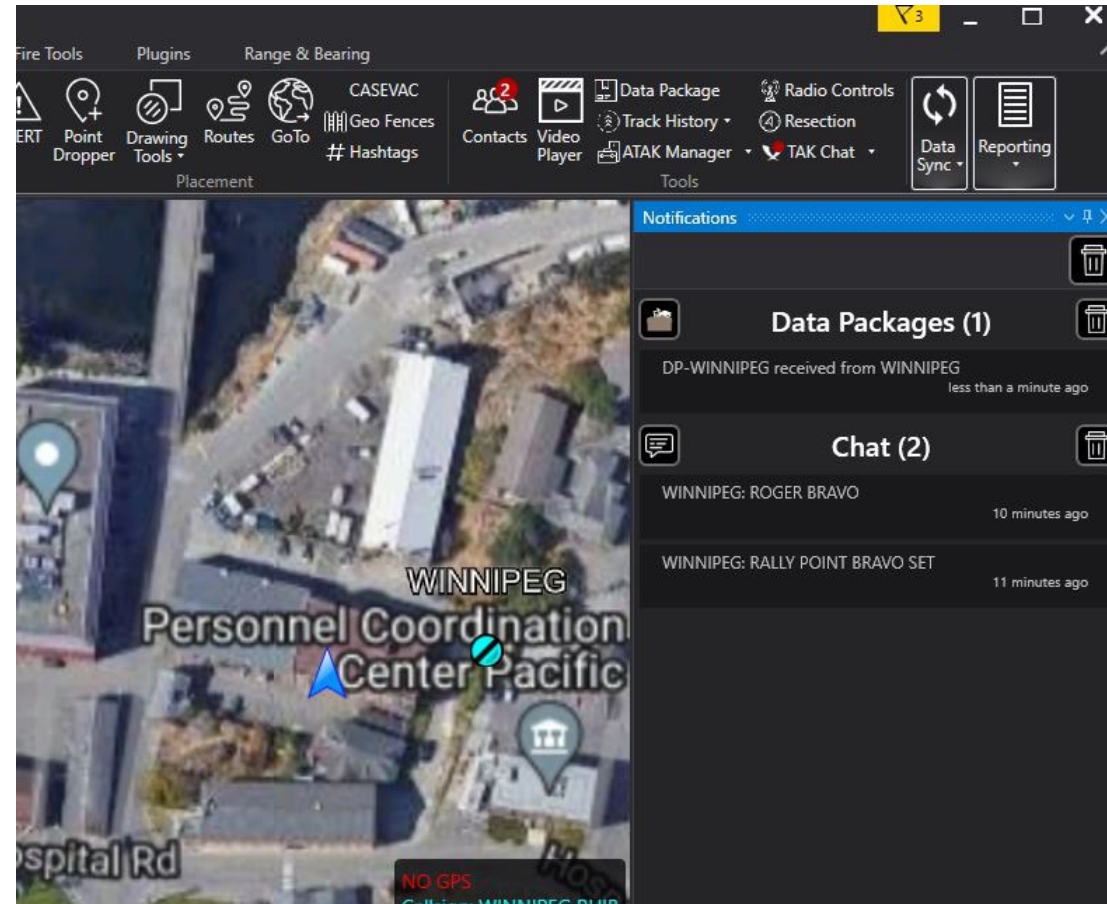
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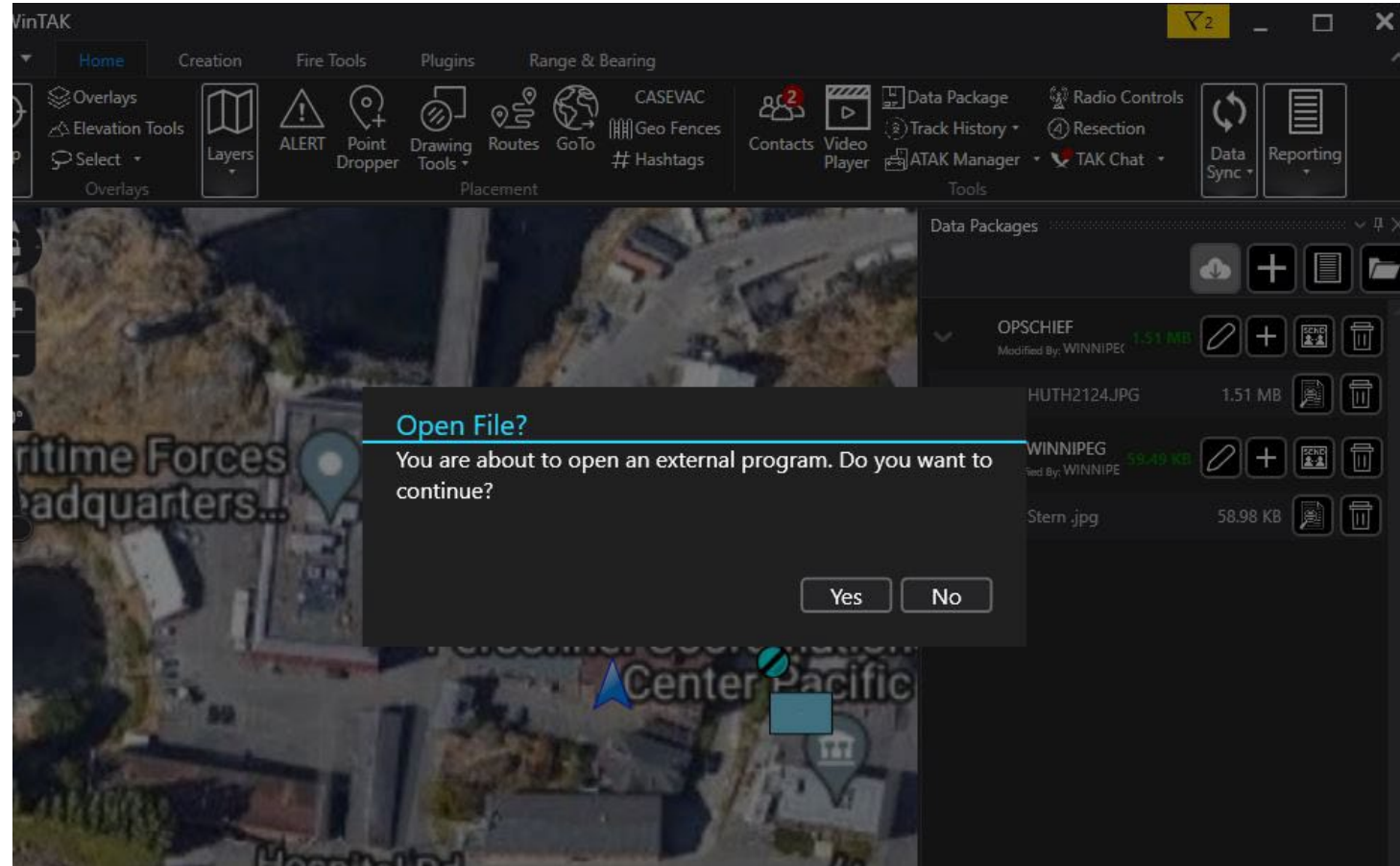
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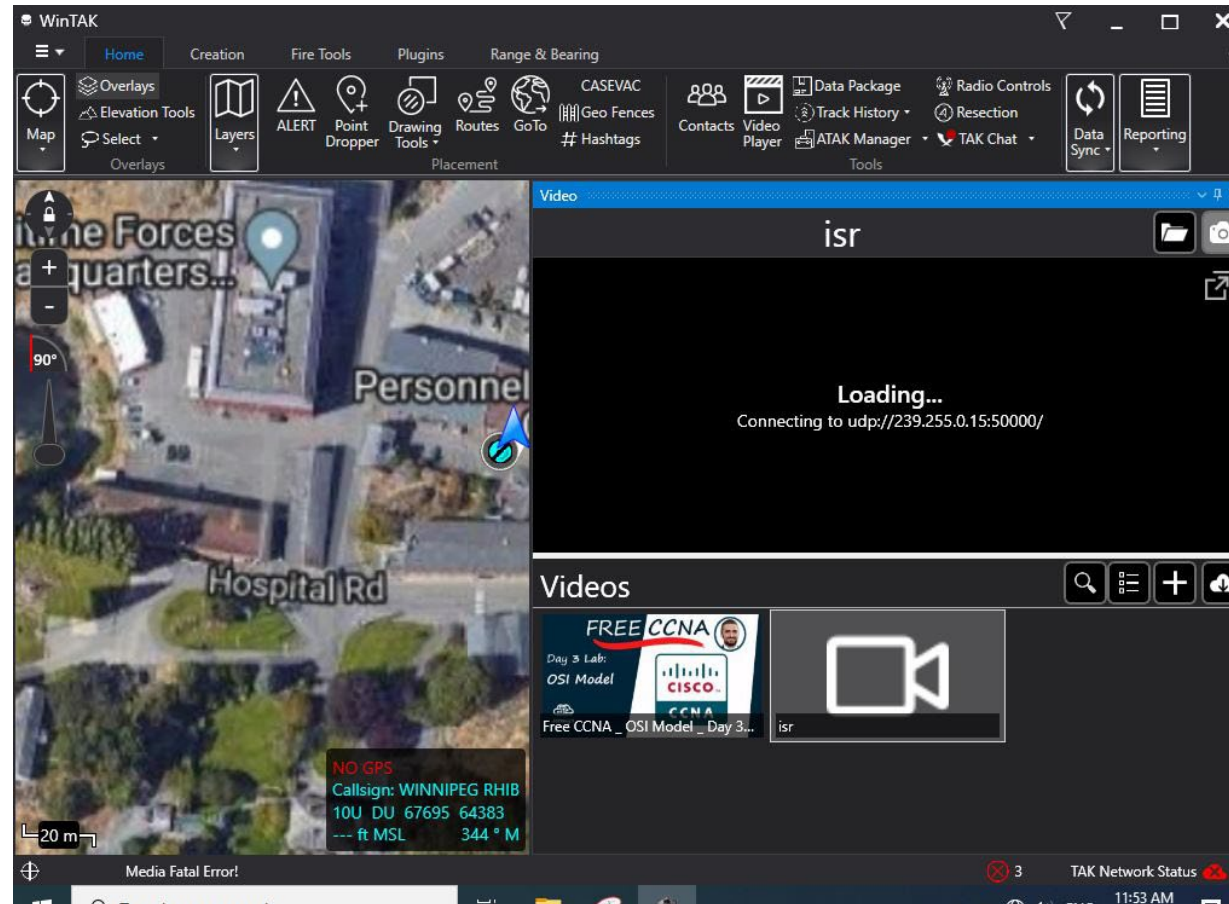
WINTAK



WINTAK



WINTAK



LEO SERVICES – IRIDIUM/NORTAC

- SCC TITAN DEMO

Questions?