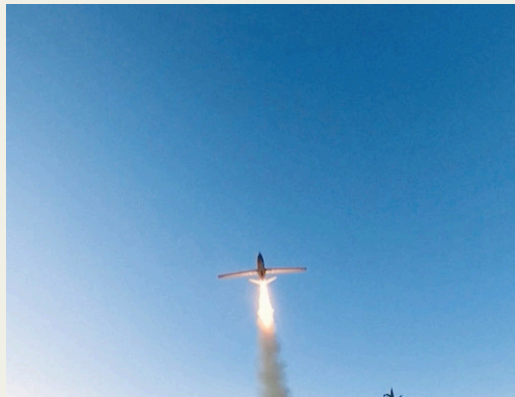


# JAMMING RESISTANT DATA LINK DRONE CONTROL SYSTEM



# JAMMING RESISTANT DATA LINK DRONE CONTROL SYSTEM

## INTRODUCTION **CONCEPT**

“Nemesis” of every unmanned system, drone, U.A.V, etc is Jamming, spoofing and all associated electronic warfare technologies which when applied in the field, achieve, either mission denial or even crash of a drone.

KERES is a system which can be either retrofitted to an existing drone or U.A.V in the place of its original links (telemetry and video) or can be integrated right from the design and assembly stages of a new one.

KERES cannot prevent drone shooting down (even small cal. 7.62 mm or 12.7 mm Browning or DShK, etc ammo. will suffice) but ensures that a KERES equipped drone shall continue to receive commands, to transmit video to its ground control and for attack or suicide drones, to release weapons or impact on target.



## JAMMING RESISTANT DATA LINK DRONE CONTROL SYSTEM

### INTRODUCTION DESCRIPTION

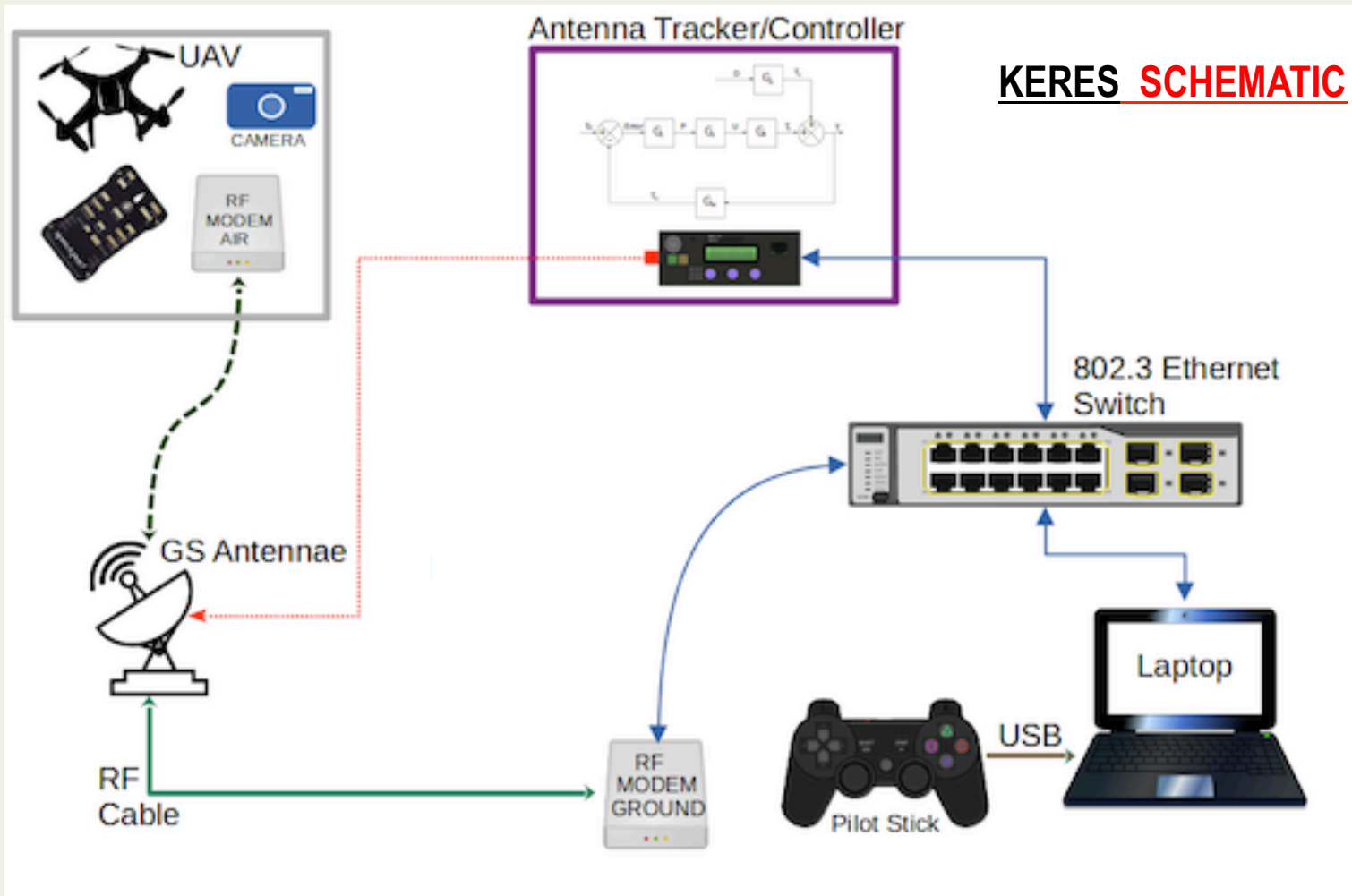
Heart of KERES is a state of the art, with continuous upgrade potential, set (pair) of links.

One ground based (master) and one airborne (slave).

Lightweight, compact and using state of the art

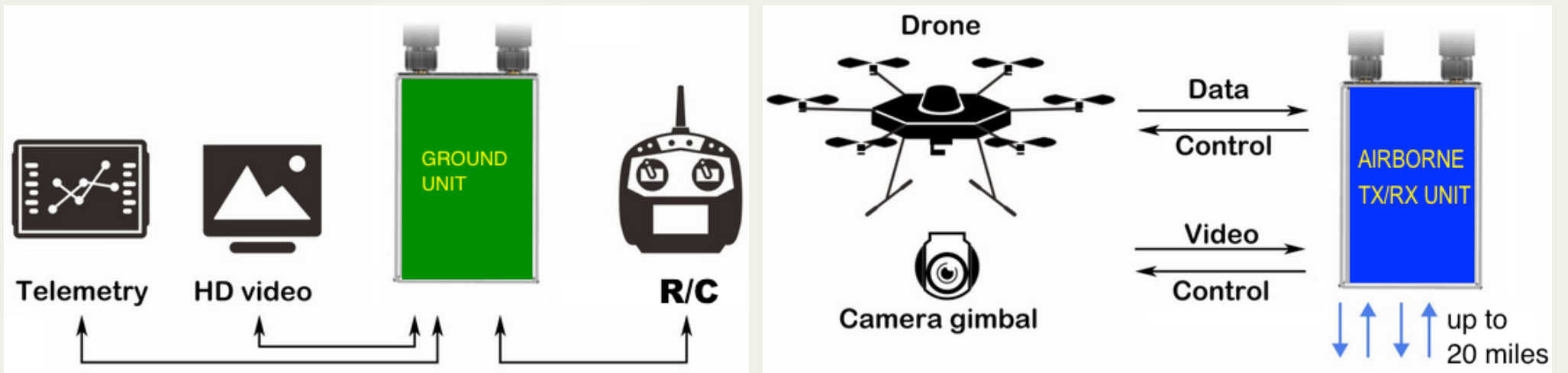
**Scalable Orthogonal Frequency Division Multiplexing** (SOFDM) algorithms can successfully resist and defeat every known, field deployable, jammer.





**KERES SCHEMATIC**

**JAMMING RESISTANT DATA LINK DRONE CONTROL SYSTEM**



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# **JAMMING RESISTANT DATA LINK DRONE CONTROL SYSTEM**

## **MAIN FEATURES – part 1 STANDARD VERSION**

- Pre-flight user selectable TX/RX bands and channel frequency. Not restricted to use the standard ISM frequency bands that commercial drones and most (i.e. not sophisticated) jammers use. User carries full responsibility for unauthorised use.
- Pre-flight user selectable hardware RF filters to improve out of band interference.
- Channel frequency change during flight commanded by the user.
- OFDM modulation for improved narrow band interference.
- Interference and/or bad signal conditions alert before as well as during flight.
- Option for ground station directional antennae.

# **JAMMING RESISTANT DATA LINK DRONE CONTROL SYSTEM**

## **MAIN FEATURES – part 2 UPGRADE OPTIONS**

- Option A : MIMO Support
- Option B : Direct Sequence Spread Spectrum DSSS
- Option C : Frequency Hopping Spread Spectrum FHSS
- Option D : Airborne RX band stop filters for known jammer bands.

# **JAMMING RESISTANT DATA LINK DRONE CONTROL SYSTEM**

## **OTHER FEATURES AND UPGRADES OPTIONS part 3**

- Free from usage restrictions regarding geographical area, time and duration of use. Cannot be remotely locked or in any way disabled or degraded by O.E.M ORDTECH in contrast to the normal practice of manufacturers of other systems.
- UPGRADE D  
Data link Encryption
- UPGRADE E  
Chirp Spread Spectrum CSS (reduced detection and intercept characteristics against sophisticated electronic warfare enemy units).
- UPGRADE F  
RF site survey features of the ground control unit.



# JAMMING RESISTANT DATA LINK DRONE CONTROL SYSTEM

## CHARACTERISTICS – part 1

### Airborne Unit (Slave)

- Mass :
  - < 1 Kg (powered by drone batteries)
  - < 2 Kg (using own batteries)
- Dimensions :
  - 15 cm X 15 cm X 5 cm
- Number of Antennae :
  - 4
- Antennae Type :
  - Omnidirectional Single or Dual Band

### Ground Unit (Master)

- Mass :
  - < 10 Kg
  - < 2 Kg (using own batteries)
- Case Enclosure :
  - Suitcase Type

# JAMMING RESISTANT DATA LINK DRONE CONTROL SYSTEM

## CHARACTERISTICS – part 2a

### Ground Control Unit Antennae

- Number of Antennae: 4
- Antenna Type:
  - Omnidirectional Single or Dual Band (Standard Type)
  - Directional Log-Periodic Broadband (Optional)
  - Directional Patch Panel Multi-band (Optional)

# JAMMING RESISTANT DATA LINK DRONE CONTROL SYSTEM

## CHARACTERISTICS – part 2b

### Ground Control Unit Antennae Mounting Options

- On Ground Station for Rod Type (Standard Version).
- Static Base for Log-Periodic and Patch Panel (Optional).
- Two-Axii (Azimuth & Elevation) **Pedestal Manual Movement** for Log-Periodic and Patch Panel (Optional).
- Two-Axii (Azimuth & Elevation) **Pedestal Electric Movement** for Log-Periodic and Patch Panel(Optional).
- Two-Axii (Azimuth & Elevation) **Automatic Tracking** for Log-Periodic and Patch Panel(Optional).

# JAMMING RESISTANT DATA LINK DRONE CONTROL SYSTEM

## RADIO SPECIFICATIONS – part 1

- Radio Type : Software Defined Radio (SDR)
- Frequency Range : 70 MHz to 6 GHz
- ADC and DAC Resolution : 12 bit
- ADC and DAC Sampling Rate : 61 MS/s
- ADC Spurious-Free Dynamic Range : 78 dBcs
- Receive Noise Figure : < 8 dB
- Transceiver Operating Mode : Full Duplex
- Antennae Ports : 2 TX and 2 RX with fully Coherent 2X2 MIMO capability

# JAMMING RESISTANT DATA LINK DRONE CONTROL SYSTEM

## RADIO SPECIFICATIONS – part 2

- Antenna Impedance : 50 Ohm
- RF Instantaneous Analogue Bandwidth : 55 MHz in 1X1 SISO mode  
2X30 MHz in 2X2 MIMO mode
- TX Front-End Gain: 88 dB adjustable
- RX Front-End Gain: 75 dB adjustable
- Maximum TX Power : 15 dB to 30 dBm (user option)

# JAMMING RESISTANT DATA LINK DRONE CONTROL SYSTEM

## DATA LINK SPECIFICATIONS

- Video Input Port Options :
  - MIPI CSI-2
  - LAN
  - USB
- Serial Interface :
  - 1 Serial Port Full Duplex
- S. Bus :
  - 2

# JAMMING RESISTANT DATA LINK DRONE CONTROL SYSTEM

## JAMMING RESISTANCE BANDS

- 310 ~ 470 MHz
- 840 ~ 930 MHz
- 1171 ~ 1381 MHz
- 1400 ~ 1452 MHz
- 1510 ~ 1620 MHz
- 2385 ~ 2500 MHz
- 5150 ~ 5350 MHz
- 5725 ~ 5900 MHz