# East &Northern Conference

Surveying in a modern world

# Entrenchment of emerging surveying technologies in Uganda;-prospects and constraints

Presented by Mulindwa David(RSU)

Managing Director Eagle Surveys Solutions Limited

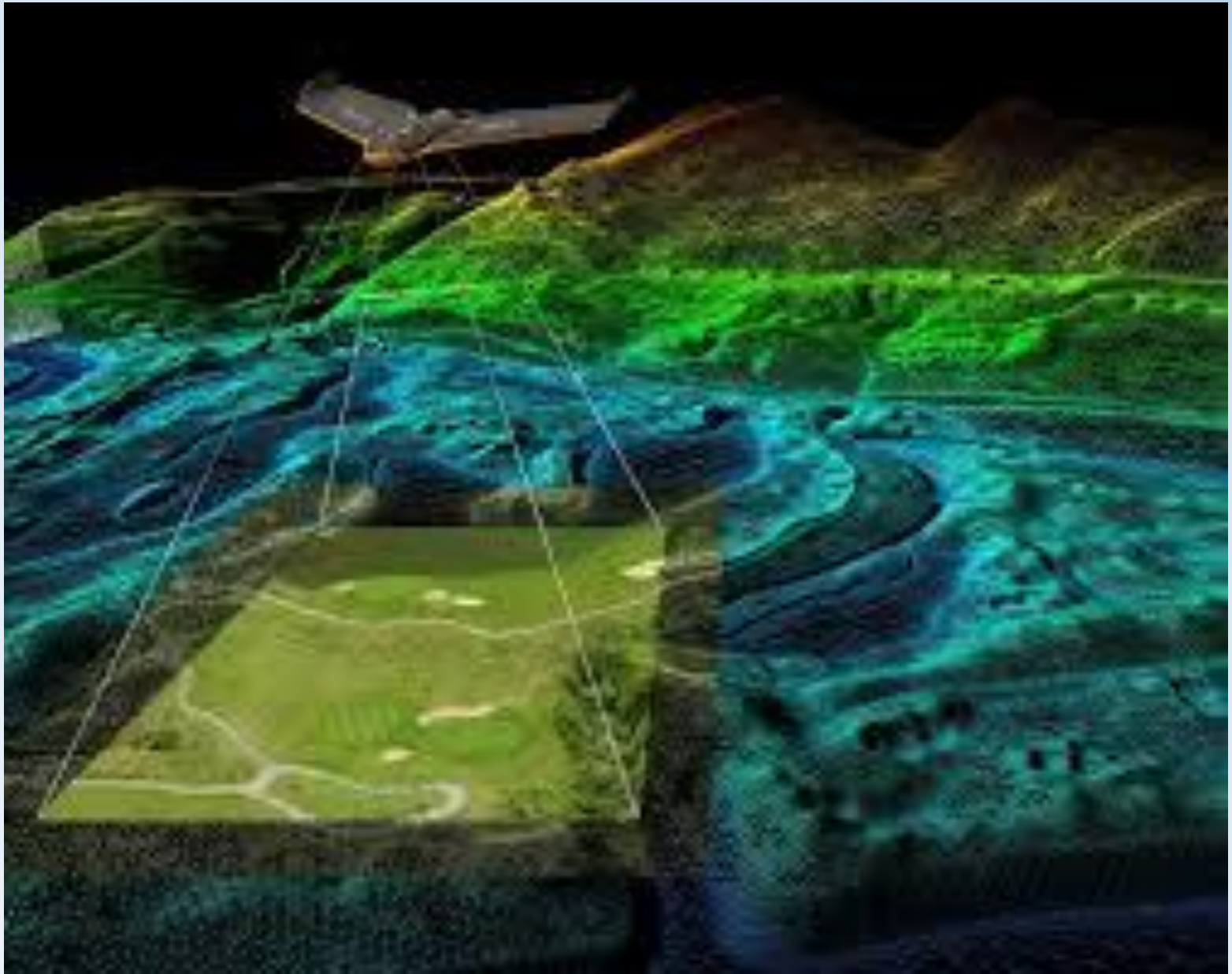
Founding Partner Southern Hemisphere Surveyors

# Drone technology  & CORS(NRTK) technology

# Drone technology

# Multi-rotor and Fixed Wing

# Bird’s eye view



# Bird’s eye view

# Flight Planning

# Flight Planning

# Adv

- Safety of employees
- Survey Speed
- Project budget
- Improved data resolution
- Access to unreachable places
- Single tool

# Bottlenecks

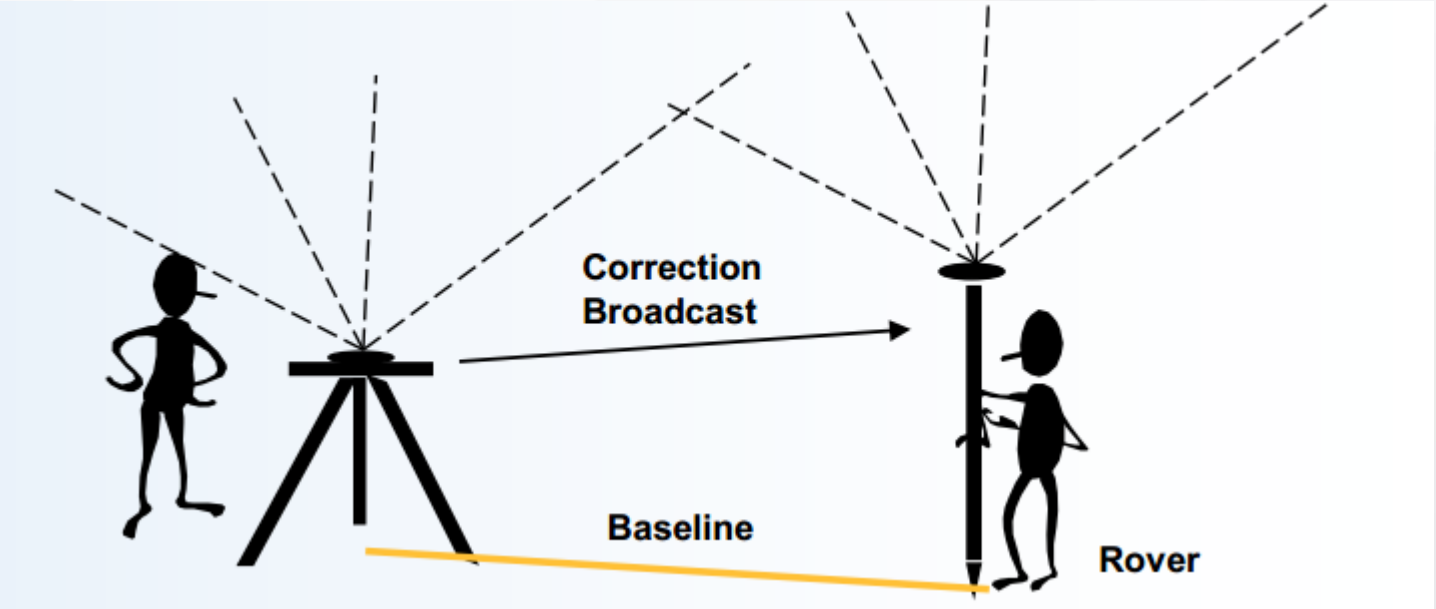
- Legislation
- Cost
- Professional drone pilots
- Weight
- Fewer sensors
- Training centers

# Continuously Operating Reference Stations

- Courtesy of EagleCORS Uganda

# Conventional RTK: Base -Rover

- A Reference Station (RS) receiver makes observations
- RS sends differential corrections (or raw data) to a rover receiver that could be either stationary or moving via a data link (UHF, now GPRS also available on ComNav T300)
- Rover receiver performs DGPS/RTK positioning using the corrections (or raw data)



# Network RTK (CORS)

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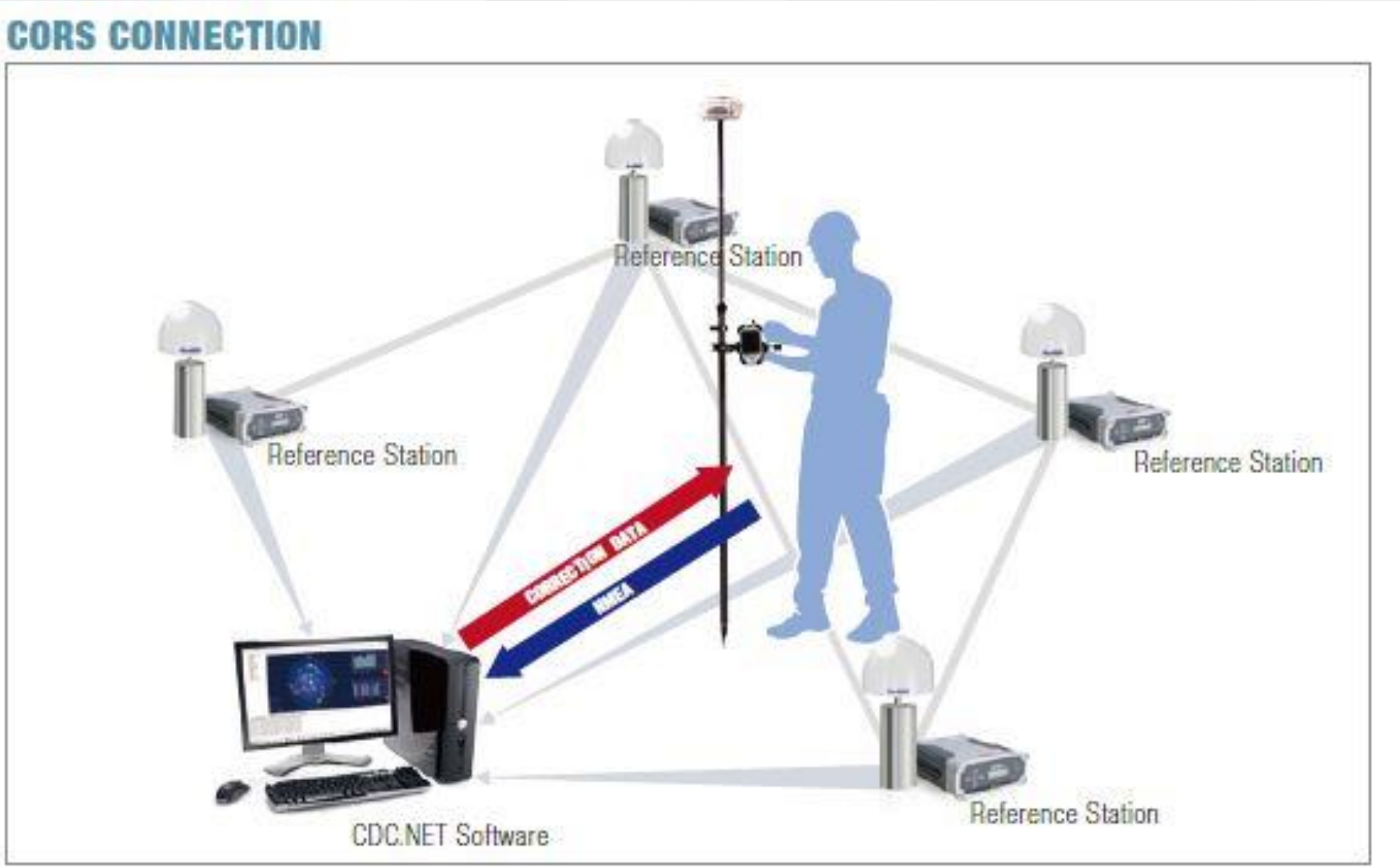

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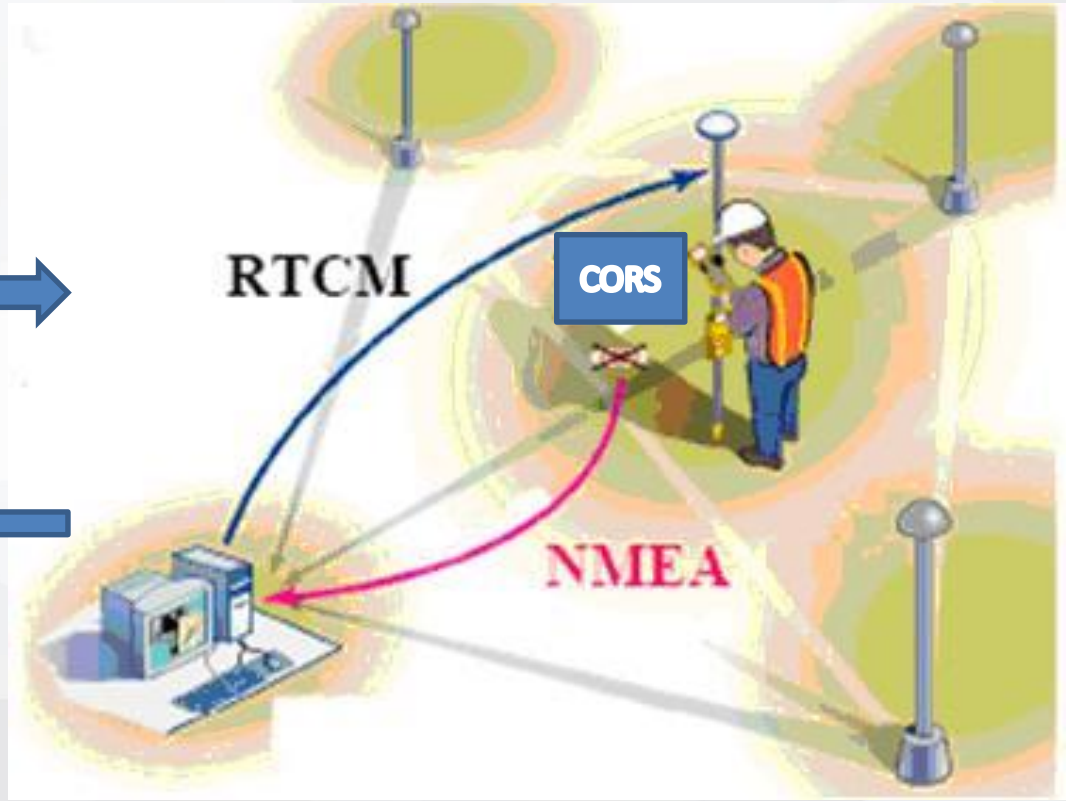
# Continues Operation Reference Station (CORS)



# Why Network RTK (CORS)

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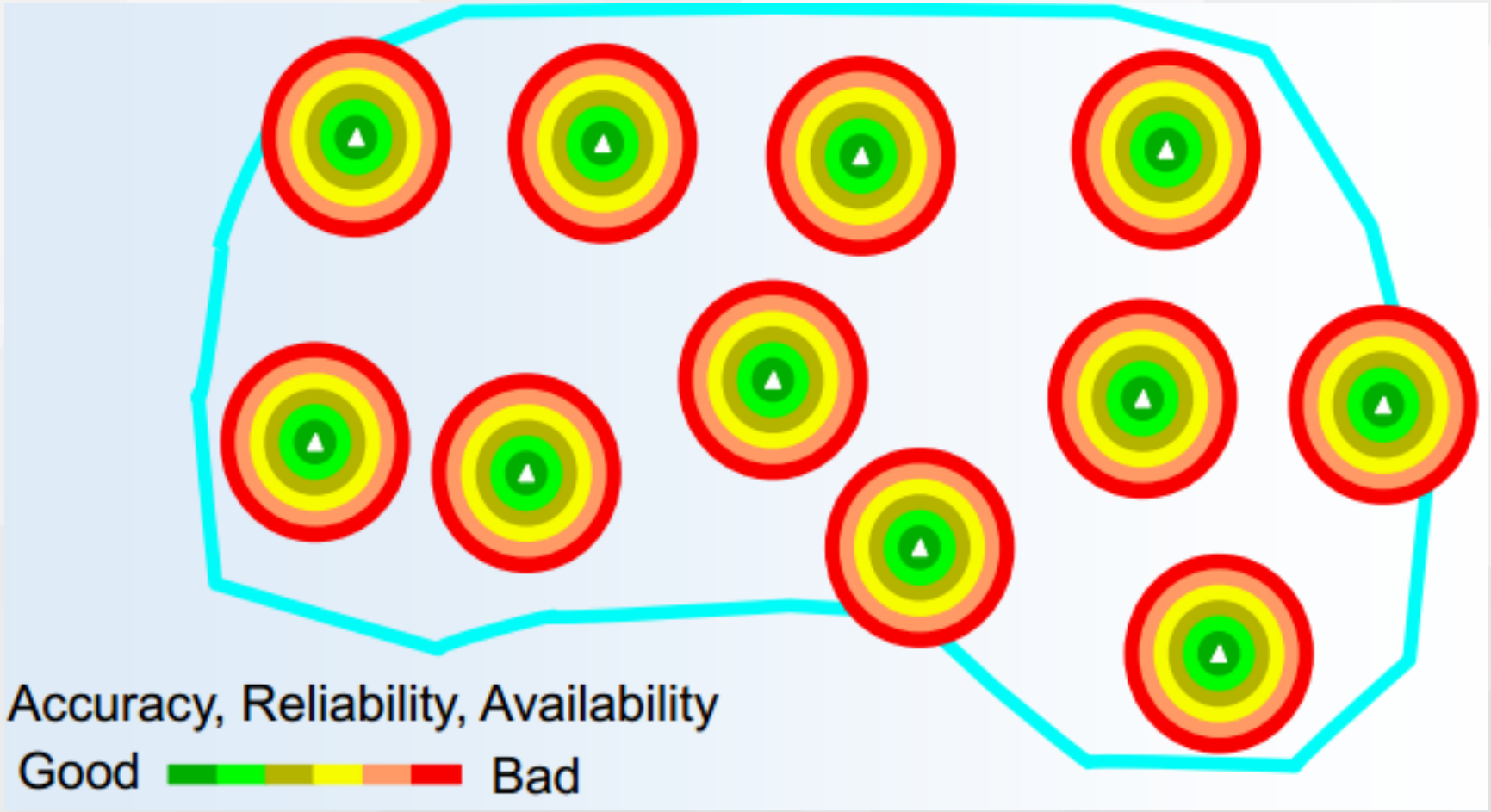
- Network of Single Reference Stations & Their Coverage



# Why Network RTK (CORS)

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- Improve accuracy, reliability and availability (precisely model distance dependent errors in a region)
- Reduce the number of RSs needed (inter-station distances > 80 km) & huge saving in infrastructure construction (~80% less RSs)
- Expand rover-to-nearest-RS baseline > 40 km
- GSM/GPRS/3G link (better signal penetration)

# Why Network RTK (CORS)

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- Network RTK (CORS)

# Network RTK (CORS)
# Advantages over Conventional RTK

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- Modelling GPS errors over the entire network area
- Increased positioning robustness against RSs failures
- Increased mobility and efficiency– no need for temporary RSs & one person surveys!
- Quicker initialization times for rovers
- Extended surveying range
- No restriction on the network size (regional, national, global)
- Capable of supporting multiple users and applications
- Continuous operation 365/24/7
- Provide data & corrections in a consistent datum
- Apart from RTK GPS corrections, other services provided include:
  - –RINEX datasets for post-processing
  - –GPS corrections for DGPS (one stone two heads)
  - –Wide exploitation for geospatial, meteorological, transport, environmental and engineering applications
- Allow central control and monitoring of all stations/high integrity monitoring scheme

# Main Applications

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- Land Survey
- Machine Control
- Agriculture
- Precise Timing
- Drive Test
- Aerospace
- Deformation monitoring
- Unmanned system


# More Applications

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# Land surveying and GIS

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- BeiDou is the big motivation








# Deformation Monitoring(Kuwait)

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National Bank

# CORS in Uganda

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- ComNav Technology Ltd. is the major provider and partner


# China National CORS

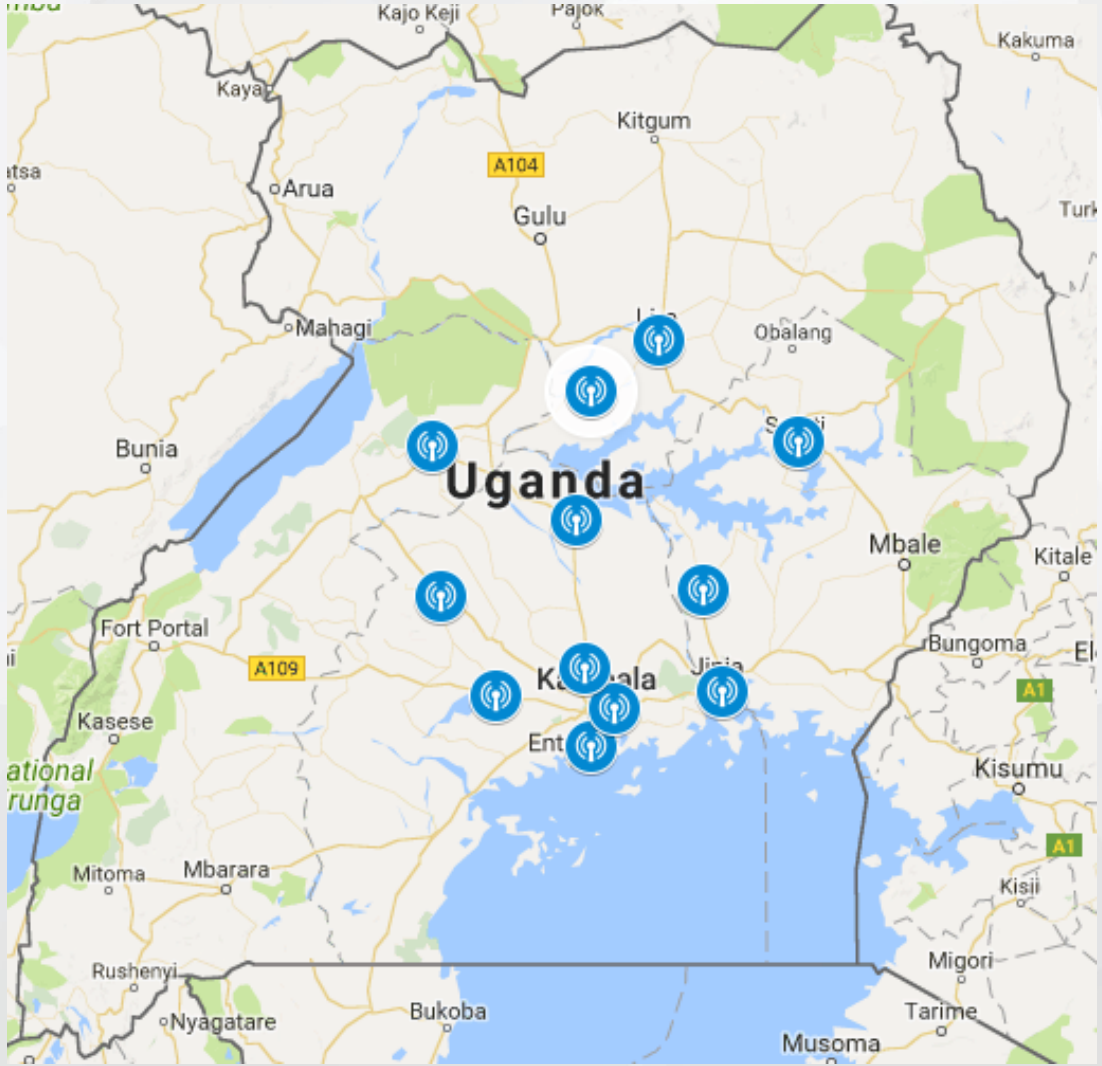
SinoGNSS®
By ComNav Technology Ltd.

- ComNav Technology Ltd. is the major provider and partner

# EagleCORS

SinoGNSS®
By ComNav Technology Ltd.

- ComNav Technology Ltd. is the major provider and partner



# EagleCORS

- How to connect?

# EagleCORS

SinoGNSS®
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- How to connect?

Request for login credentials on www.eaglecorsuganda.com or WhatsApp EagleCORS on +256782817486

Connection credentials will include;

IP: 216.104.207.102

Port:7906

User:

Password:

Sourcelist: SRTK,RTCM32-MSM4

# EagleCORS

SinoGNSS®
By ComNav Technology Ltd.

- Benefits?
  - No need to site calibrate. We are your active stations.
  - Assured CM accuracy 24/7 with precision and reliability.
  - Seamless transmission on all GNSS brands including ComNav T300, Trimble R10, Hi-target series, Topcon  etc
  - Get to enjoy VRS technology or Single base technology.
  - No need to spend on extra base unit in areas of coverage.
  - Increased robustness and greater gps error modelling power.
  - Free Static data download 365/24/7
  - Absolutely free connection.

# EagleCORS

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- Constraints

- High cost of installations
- Unreliable internet connection.
- Limited viable and sound infrastructures
- Limited users and experts.
- Fewer numbers of maintenance experts or repair engineers.
- No research and development centers.
- etc

# EagleCORS

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LETS BUILD UGANDA TOGETHER
THANKS FOR LISTENING