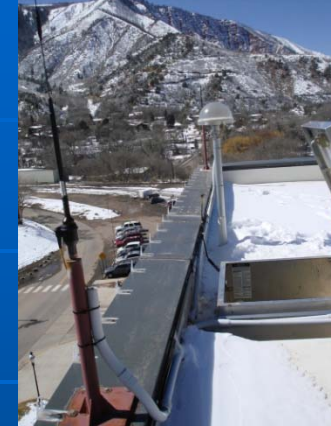# MESA COUNTY'S RTVRN

32 STATIONS/15 NGS CORS

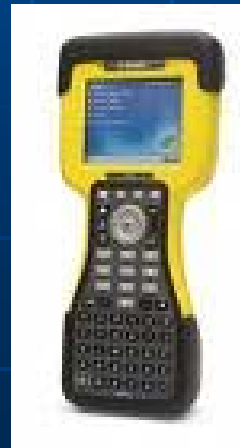# Rover/User Components of VRS

GNSS RECEIVER

CELLULAR DATA VIA SMART PHONE OR WIFI DEVICE

SURVEY CONTROLLER

Key Field Time savings of VRS

No GNSS Base Setup Time.

Instantaneous Start-up and Initializations.

Robust Communications via Cellular Network.
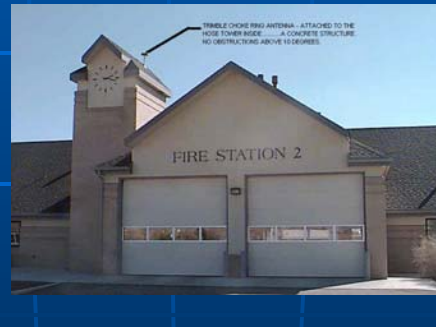
=Efficiency!!

What makes up the RTVRN???

Real Time Virtual Reference Network

Network Components of VRS

CORS

&

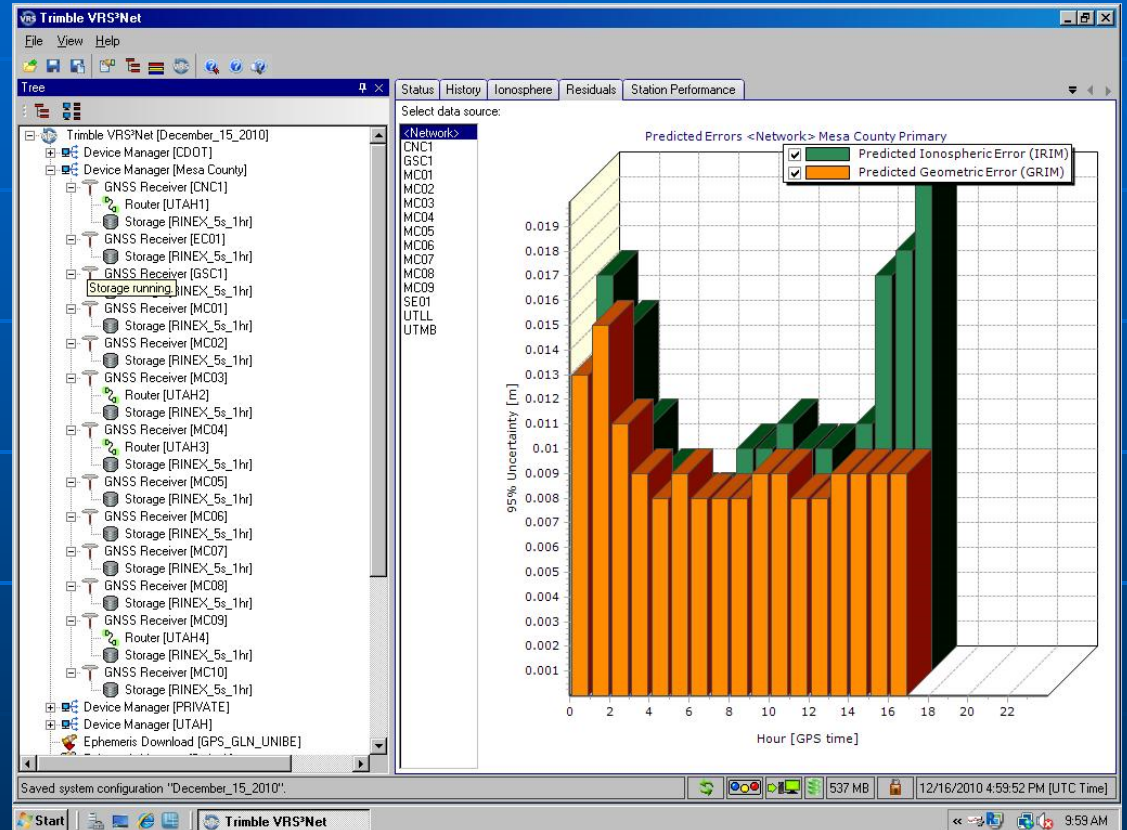## Reference Stations

Network Components of VRS

Monumentation

Hardware

Network Components of VRS

Communications

VRS³Net Software

Infrastructure

The RTVRN Virtual Servers

544 Rood Ave., Grand Junction, Colorado.

VRS³Net Software makes it all work

Data Flow

CORS/Reference
Station data streams
back to server through
LAN or Internet
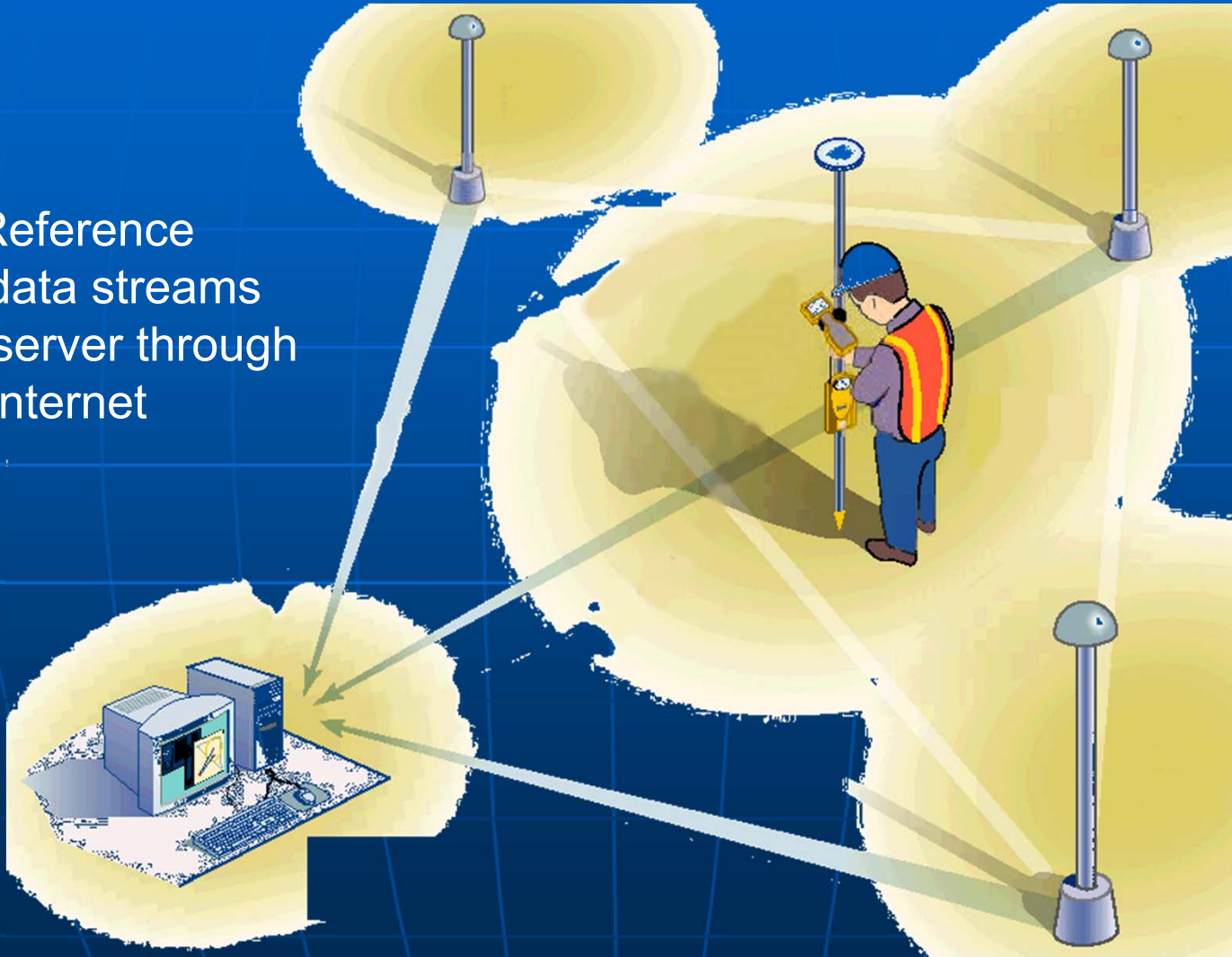
Data Flow

Roving receiver sends a NMEA string back to server using cellular modem and a VRS position is established ±1m of rover position.

VRS

NMEA - GGA
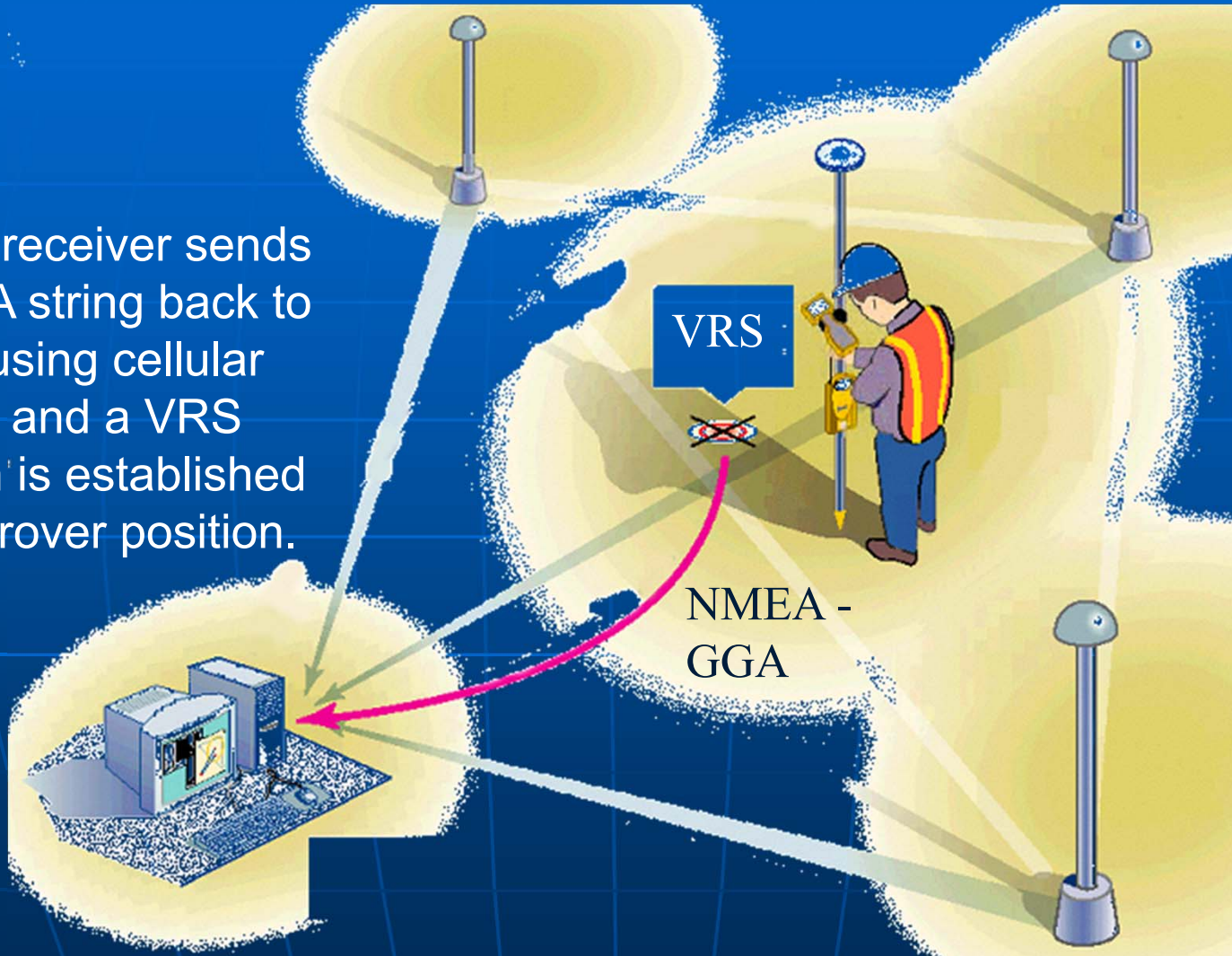
$PTNL,GGA_SYNC,211230.00,120710,3900.61855581,N,10829.35703049,W ,3,08,2.7,EHT1449.314,M*04

Data Flow

Server uses VRS position to create customized corrected observables and broadcasts to rover .

CMR+ , CMRx, RTCM

VRS

1m
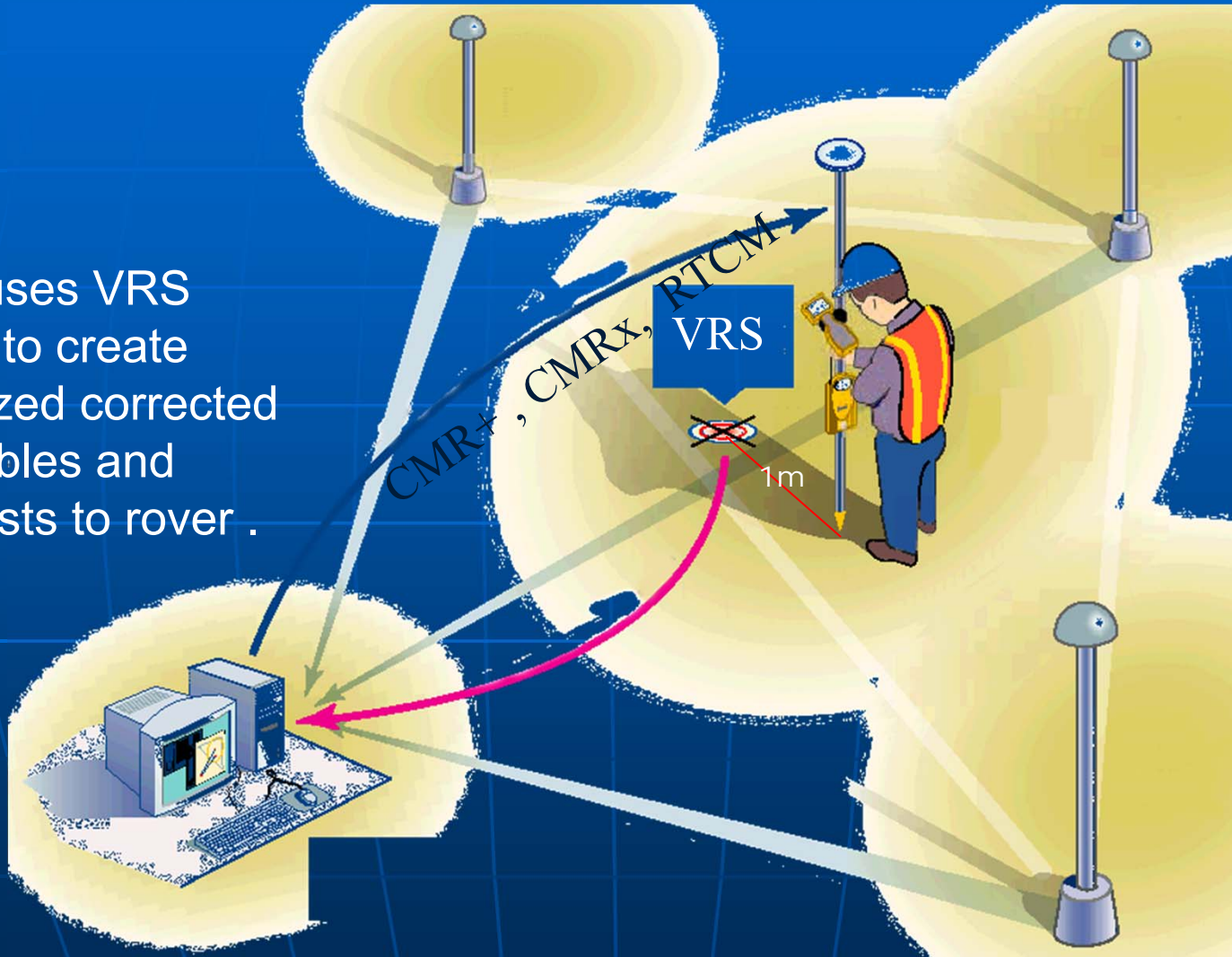
= Very short Baselines = NO PPM Error!

Data Flow

Rover surveys are normal RTK surveys but getting data as if coming from the VRS a short distance from Rover position eliminating PPM error.

CMR+, CMRx, RTCM

VRS

1m
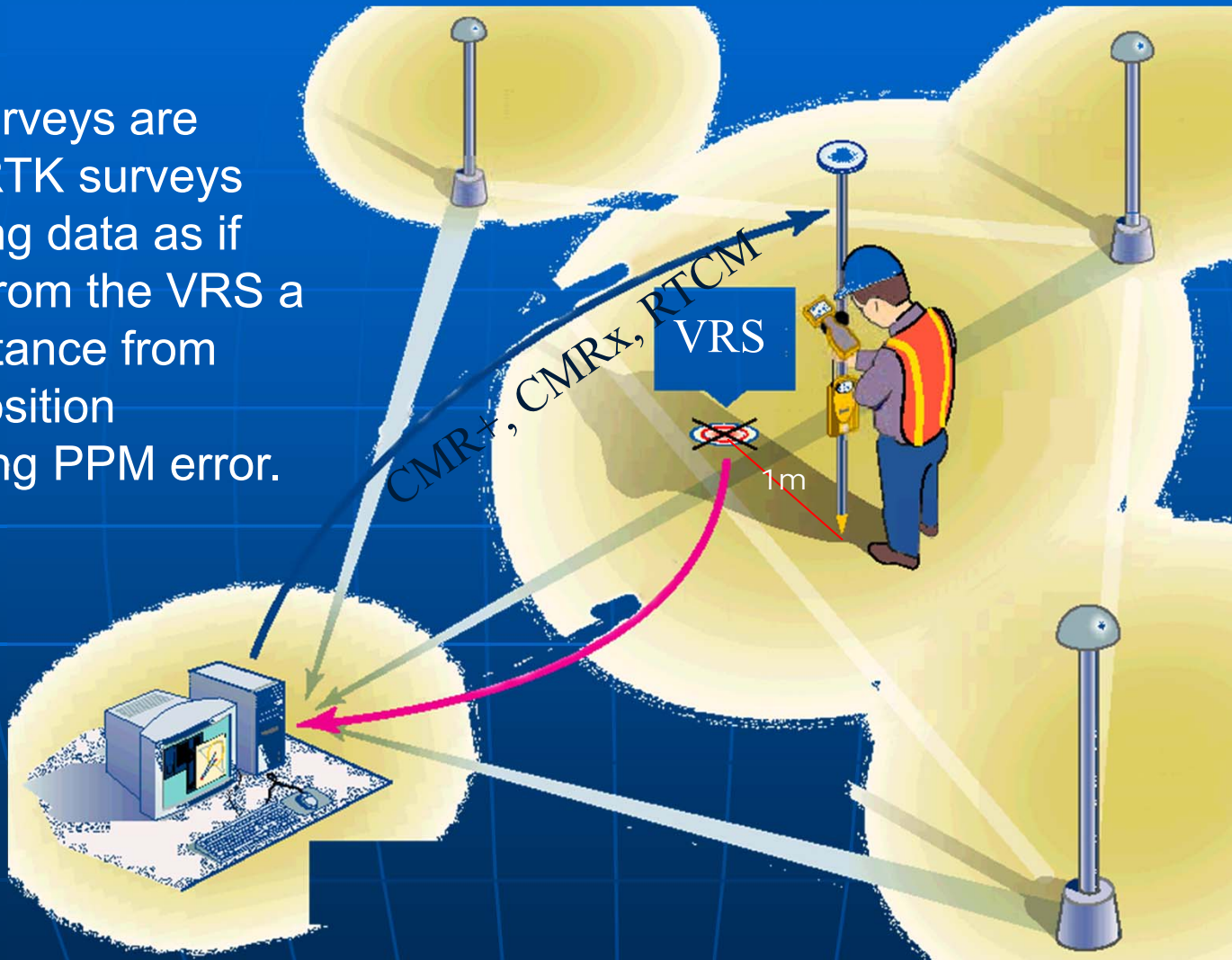
Corrections are based on the Network of Reference Stations and not just one single Reference Station as with FM radio broadcast , single baseline RTK!

VRS - How does it work?

➤ Network Processes
  - Integrity monitoring
  - Geometric correction
  - Correction for tropospheric/ionospheric errors
  - Ambiguity resolution
  - Consistency check
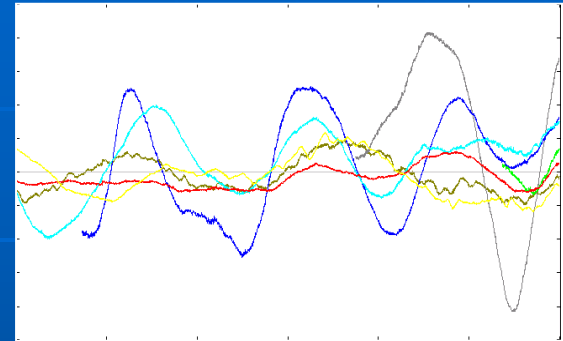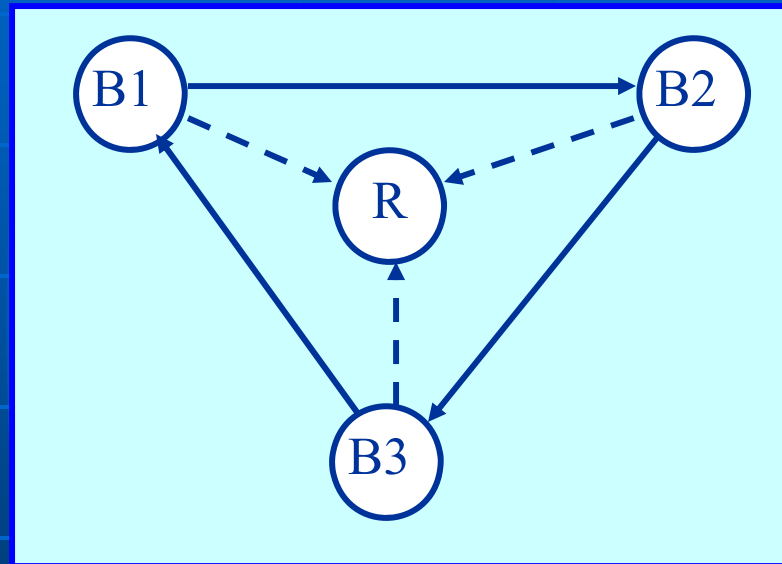 - Delivery of customized VRS corrections to your Rover location.

Network Multiple Base Station Solution

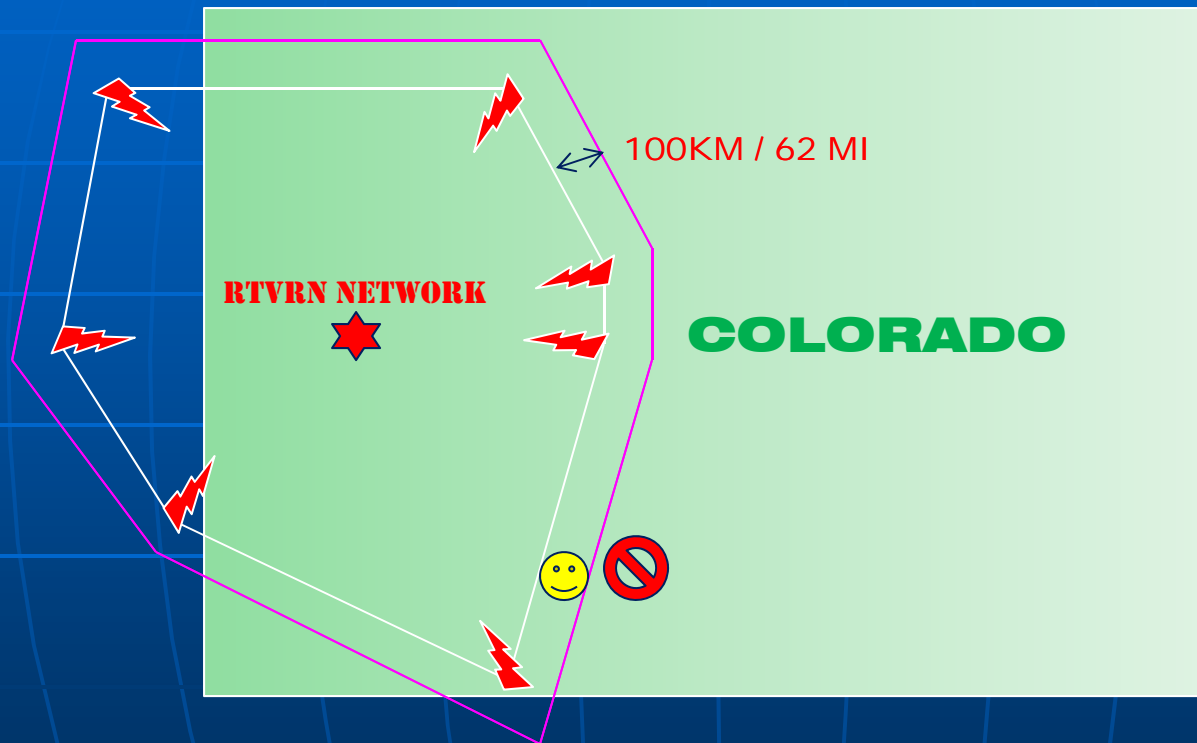Let B1, B2 B3 be base stations, R be the rover

Four RTK engines run simultaneously:
1. (1,2)
2. (2,3)
3. (3,1)
4. (1,R) + (2,R) + (3,R)

SET LIMITATIONS

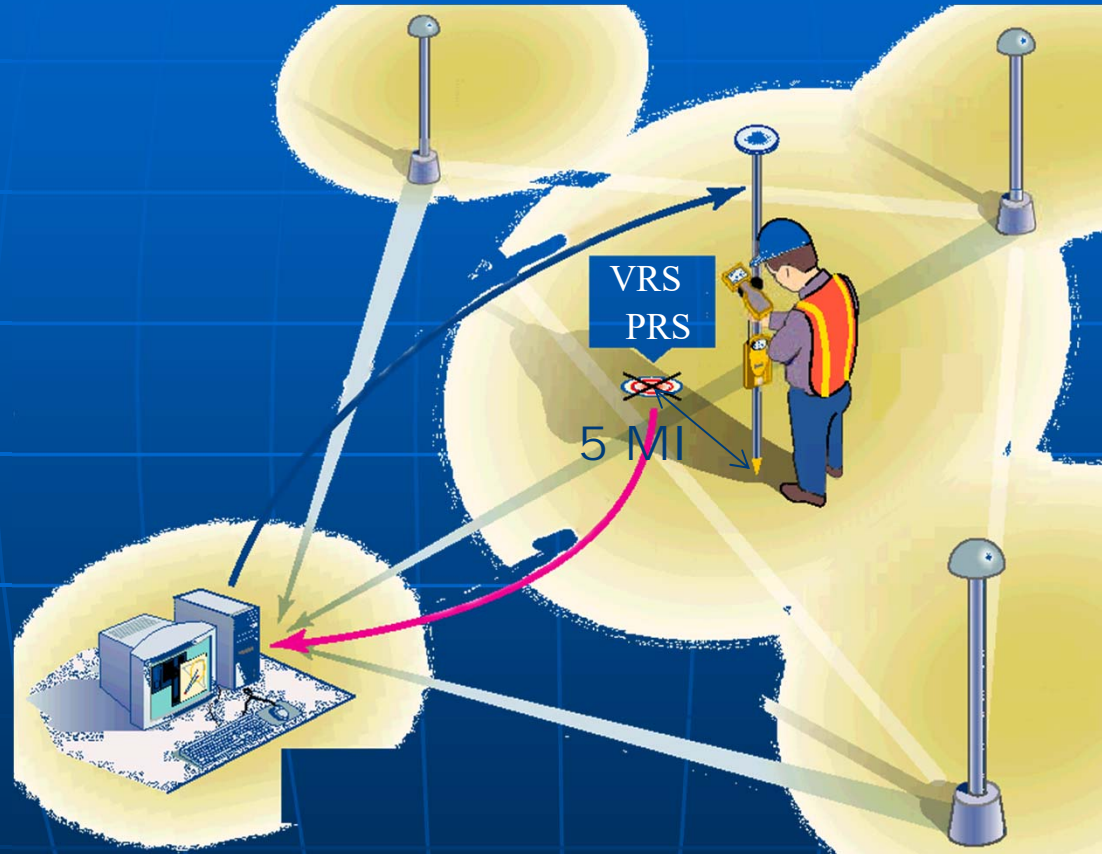## 100 KM / 62 MI OUTSIDE THE LIMITS OF THE NETWORK

THE VRS SOFTWARE WILL NOT ALLOW A ROVER TO INITIALIZE IF IT IS OUTSIDE THIS LIMIT

SET LIMITATIONS

5 MILES IS THE MAXIMUM DISTANCE FROM A VRS OR PRS.

VRS
PRS

5 MI

WHEN THAT DISTANCE IS EXCEEDED THE NETWORK SOFTWARE WILL FORCE THE ROVER TO RE-INITIALIZE AND REFERENCE TO A NEW VRS. THIS MAY OR MAY NOT CHANGE THE PHYSICAL REFERENCE STATION (PRS) OR CORS.

Advantages of VRS

- Eliminates dependency on single reference station or base station and Baseline PPM error .

- Corrections are based on the entire Network and not just one Reference Station.

- Uses established communications.

- Establishes a single coordinate system.

AND A RTVRN SUBSCRIPTION IS FREE!!!!

Mesa County RTVRN