

California Real Time Network (CRTN)

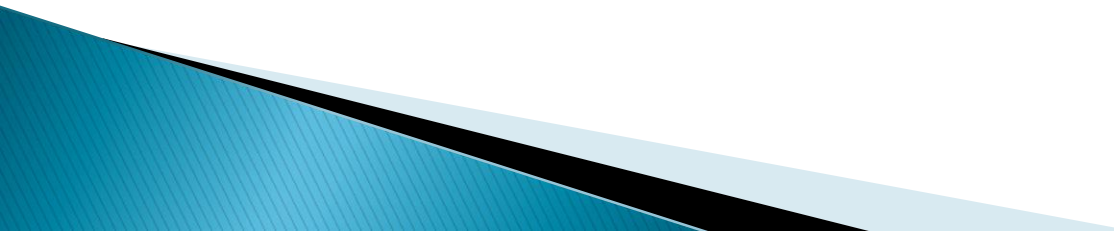
What is the CRTN and how do I use it?

Richard Maher, PLS
CSRC EC Secretary

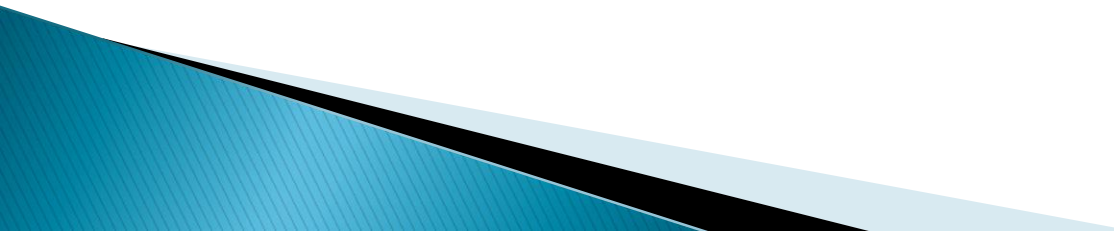
rmaher@kdmmeridian.com



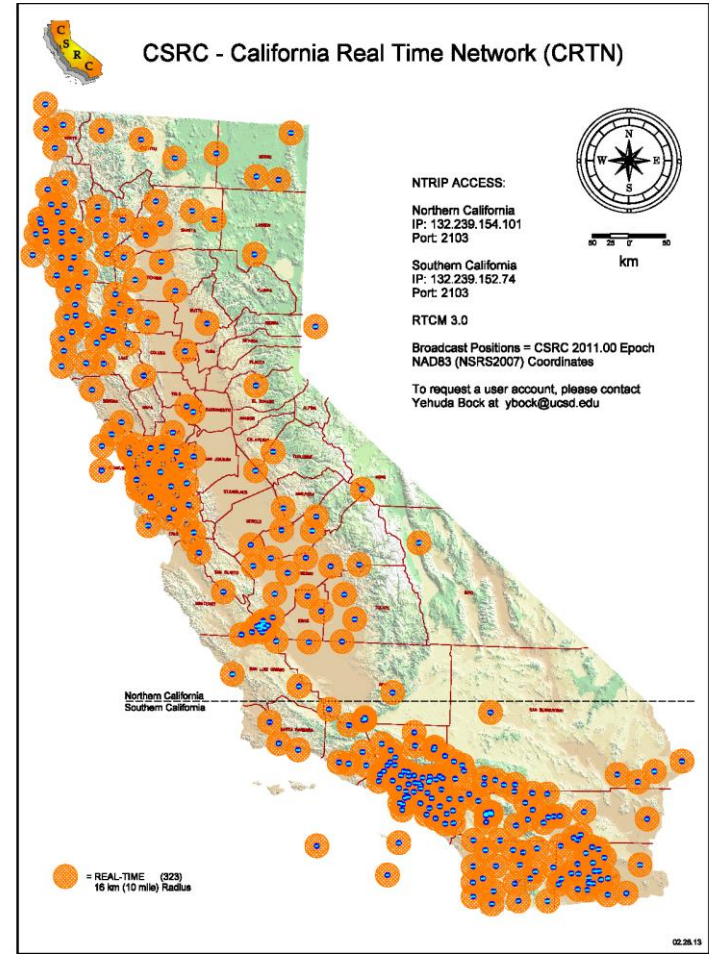
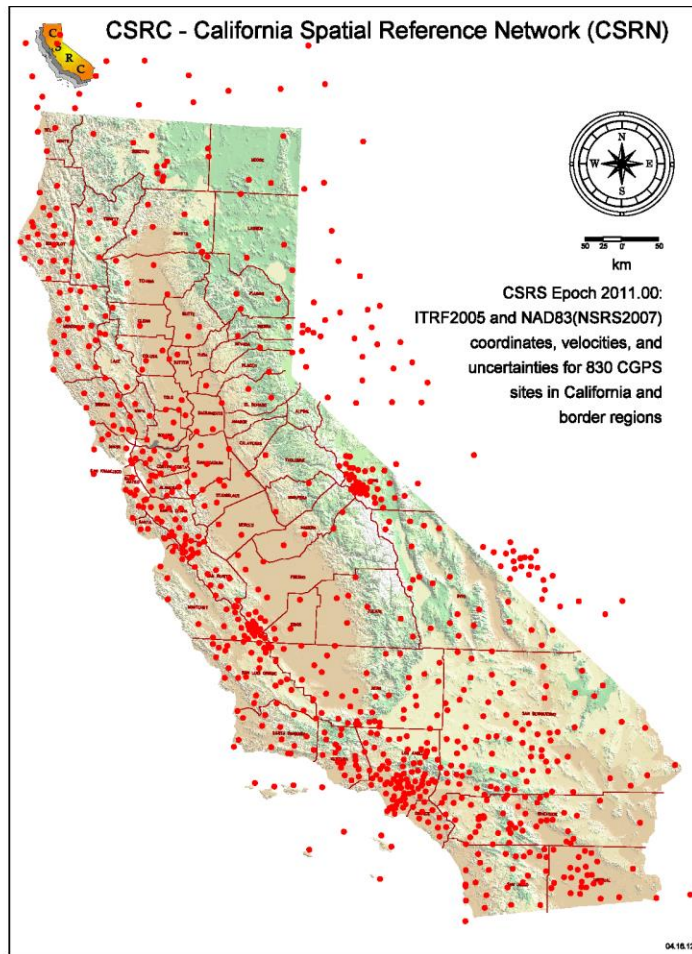
What we will cover.

- ▶ CRTN-CSRN-CA PRC
 - ▶ Why use?
 - ▶ What is it?
 - ▶ The Connection
 - ▶ Getting Started (Internet)
 - ▶ Configuration Settings
 - ▶ Information & Status of Network
 - ▶ Samples / Questions
- 

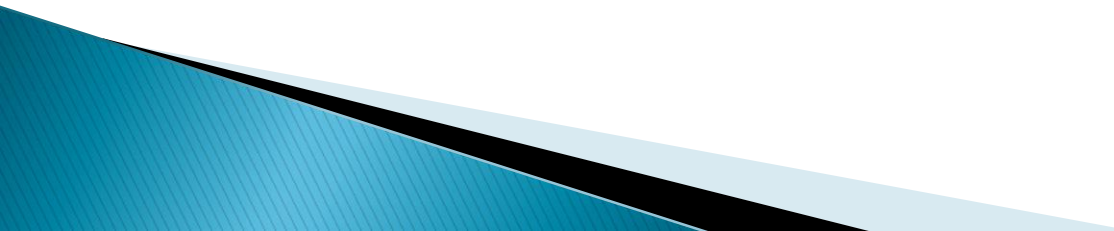
CA PRC – CSRN – CRTN

- ▶ CA PRC 8801–8902 (CSRN/CSRC)
 - ▶ CA Official geodetic reference network (CSRN)
 - ▶ CCS or Geodetic tied to CSRN or NGS
 - ▶ CRTN part of CSRN 350+/- of 830
 - ▶ Map Handouts
- 

Map Handouts – Website)



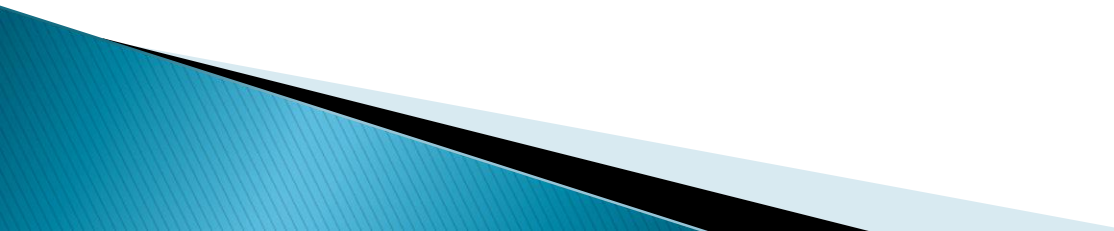
Why?

- ▶ Convenience / Efficiency / Money
 - ▶ Eliminate need for physical base/radio.
 - ▶ No setup. Radio Conflicts.
 - ▶ No risk of theft or cost of guard.
 - ▶ Known coordinate point.
- 

What are we doing?

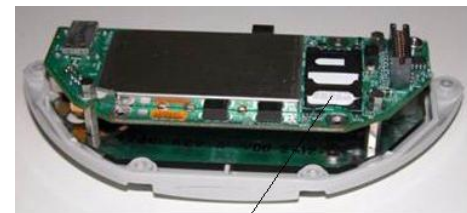
- ▶ CRTN –is– RTK (Single Base Solution)
- ▶ Basic RTK Principles
- ▶ Positioning Performance 95% (Trimble R8)
 - 10mi 1 Reading Horiz: 0.12' +/-
 - 10mi 2 Readings Horiz: 0.09' +/-
 - 10mi 3 Readings Horiz: 0.07' +/-
 - 10mi 4 Readings Horiz: 0.06' +/-

The Connection

- ▶ NTRIP: (Networked Transport of RTCM via Internet Protocol)
 - ▶ Infrastructure: Server / Caster / Client
 - ▶ Data: RTCM stream (Radio Technical Commission for Maritime Services)
 - ▶ Coordinates
- 

Getting Started (The Internet)

- ▶ Data Collector vs. Receiver
- ▶ Getting hooked up:
 - Serial Modem
 - Bluetooth DUN
 - Tethering by Bluetooth/WiFi (Cell Phone)
 - WiFi Device
 - Built in Cell (usually SIM)



Enter SIM Card Here

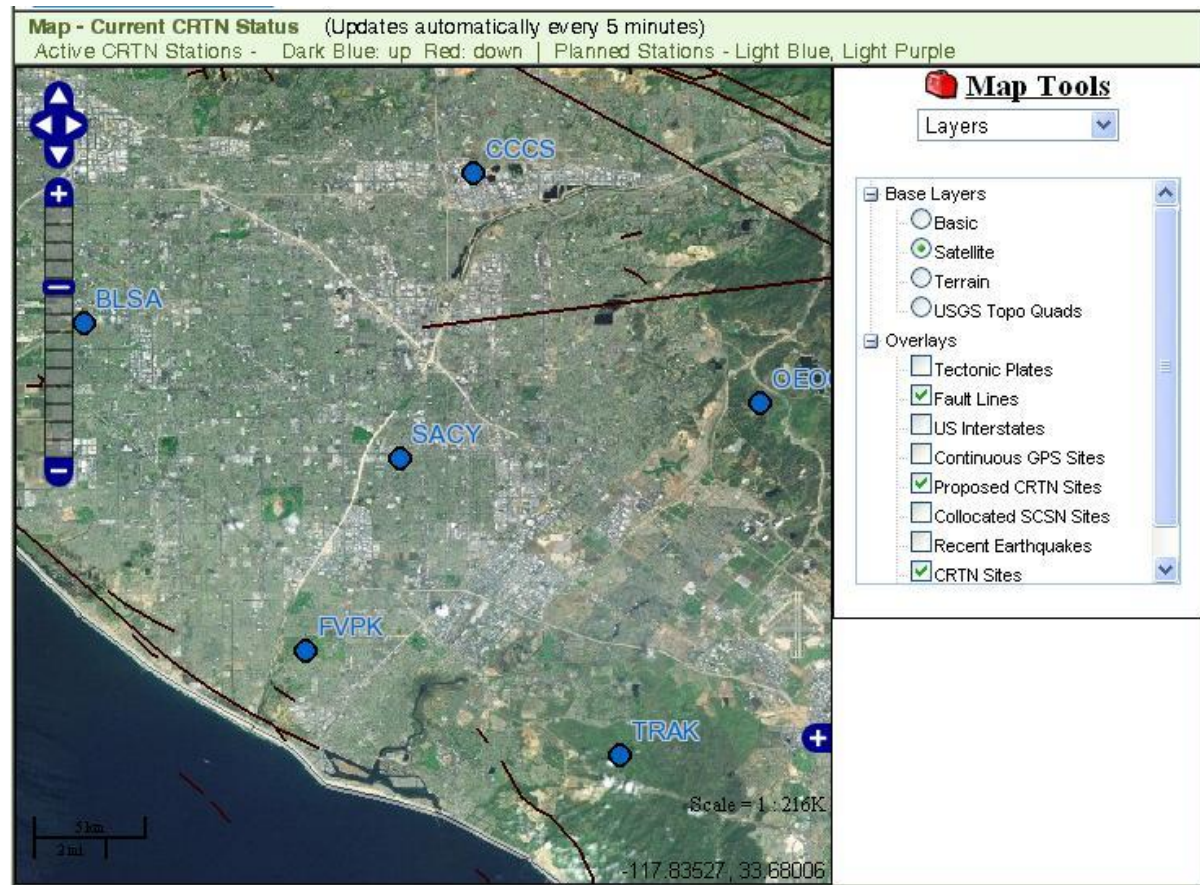
Configuration Settings

- ▶ NTRIP Access:
 - Northern California
 - IP: 132.239.154.101
 - Port: 2103
 - Southern California
 - IP: 132.239.152.74
 - Port: 2103
- ▶ RTCM v3.0
- ▶ Broadcast Coordinates CSRC 2011.00 Epoch – NAD83 (NSRS2007)
- ▶ Account Setup: ybock@ucsd.edu
- ▶ Website: csrc.ucsd.edu
- ▶ Forums: CRTN

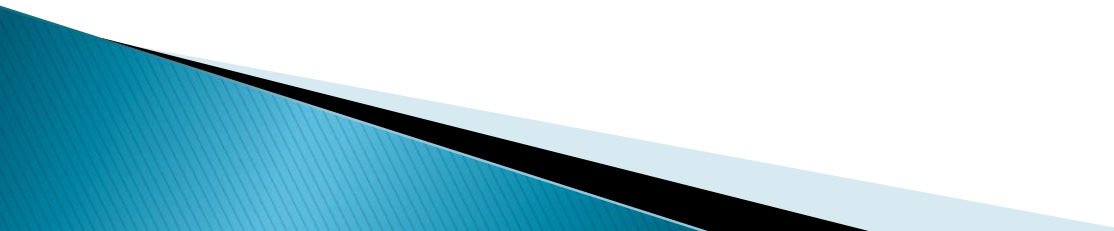


Status

► CRTN Current Status Map:



Samples / Questions

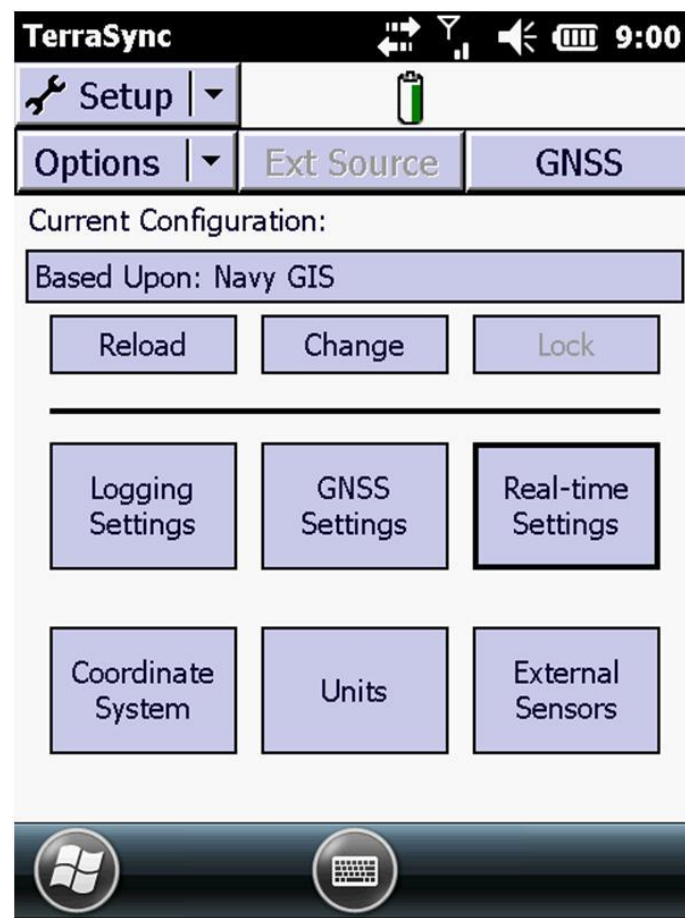
- ▶ Connection Configuration Database
 - ▶ Samples
 - GeoXH
 - TSC2 (Access) R8
 - ▶ Questions?
- 

Mapping Unit (GeoXH 6000)

- ▶ 10cm and 1cm versions
- ▶ GIS Mapping
- ▶ SIM Chip Cell Phone Internal



GEOXH 6000



GEOXH 6000



GEOXH 6000

TerraSync 9:01

Setup

External Source Settings

Correction Datum:
NAD 1983 (Conus)

Type: Single Base

Connection Method:
Internet

Address:
132.239.152.74

Port: 2103

Done Cancel

TerraSync 9:01

Setup

External Source Settings

Source: WHYT_RTCM3

User name:
KDMCrew1

Password:

Connection Control: Auto

Real-time Protocol: Auto

Station ID: Any

Done Cancel

Survey Unit (TSC2 Access/R8)

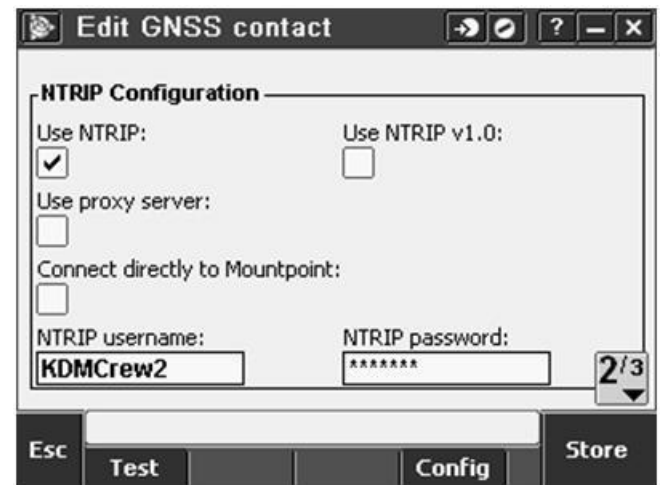
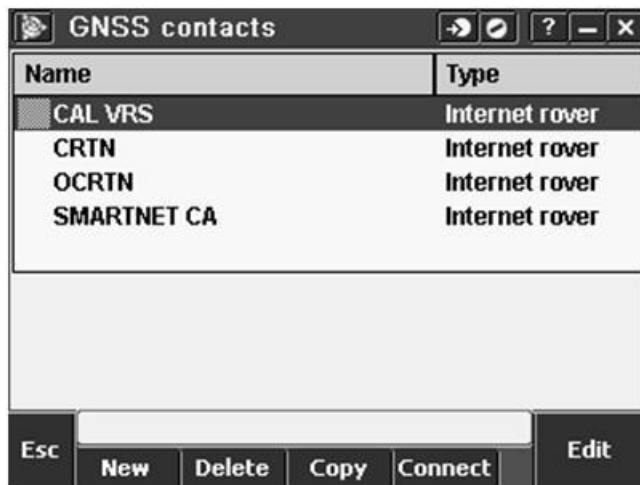
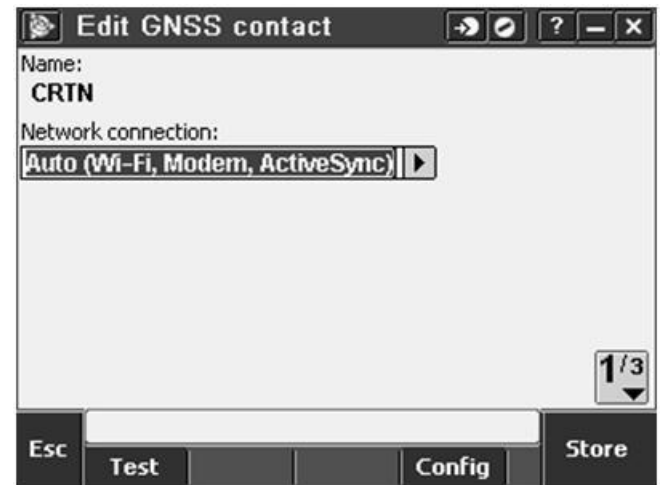
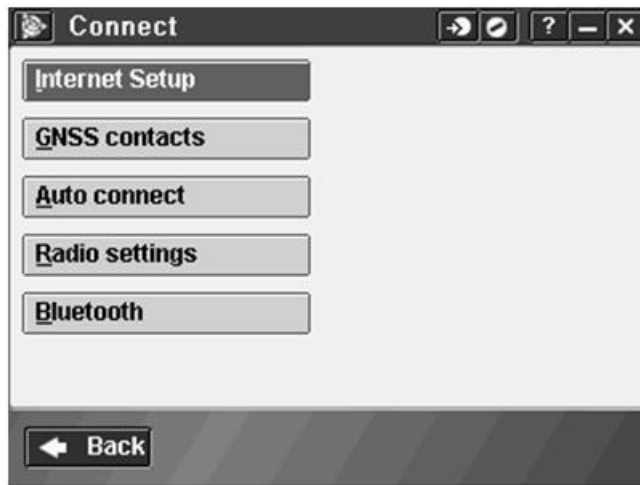
- ▶ Survey Grade Receiver
- ▶ WiFi Data Collector
- ▶ WiFi Cell Device



TSC2 Access WiFi



TSC2 Access WiFi



TSC2 Access WiFi

Edit GNSS contact

IP Address: IP Port:

Send user identity info:
☐

3/3

Esc Test Config Store

Bluetooth

Connect to GNSS rover: Connect to GNSS base:

Connect to conventional instrument:

Connect to laser: Send ASCII data to:

Connect to echo sounder: Automatically enable Bluetooth: ☒

Esc Config Accept

Survey Styles

| Name | Size | Modified | Location |
|------------|------|-----------|----------|
| CAL VRS | 2kb | 7/23/2012 | \Trimble |
| CRTN | 2kb | 7/23/2012 | \Trimble |
| FastStatic | 2kb | 8/10/2012 | \Trimble |
| I-CAL VRS | 2kb | 7/23/2012 | \Trimble |
| I-CRTN | 2kb | 7/23/2012 | \Trimble |
| I-OCRTN | 2kb | 7/23/2012 | \Trimble |
| I-SMARTNET | 2kb | 7/23/2012 | \Trimble |
| OCRTN | 2kb | 9/14/2012 | \Trimble |
| PRK | 2kb | 7/23/2012 | \Trimble |

Esc New Copy Delete Options Edit

CRTN

Rover options

- Rover radio
- Base options
- Base radio
- Topo point
- Observed control point
- Rapid point
- Continuous points
- Stakeout
- Site calibration
- Duplicate point tolerance
- Laser rangefinder

Esc Store Edit

TSC2 Access WiFi

Rover options [Navigation icons] [?] [—] [X] [100% battery]

Survey type:
RTK ▼

Broadcast format:
RTCM RTK ▼

Elevation mask:
10° ▶

PDOP mask:
6.0 ▶

Map
Menu
Favorites
Switch to

1/3 ▼

Esc [Input field] Accept

Rover options [Navigation icons] [?] [—] [X] [100% battery]

Tracking

Use L2e: **Yes**

GPS L2C: ☐

GLONASS: ☒

Map
Menu
Favorites
Switch to

3/3 ▲

Esc [Input field] Accept

Rover options [Navigation icons] [?] [—] [X] [100% battery]

Antenna

Type:
R8 GNSS/SPS88x ▼

Measured to:
Bottom of antenna mount ▼

Antenna height: **2.000m** ▶ Part number: **60158-00**

Serial number:
?

Map
Menu
Favorites
Switch to

2/3 ▼

Esc [Input field] Accept

Rover radio [Navigation icons] [?] [—] [X] [100% battery]

Type:
Internet connection ▼

Route through controller:
Yes

GNSS Contact:
CRTN ▶

Prompt for GNSS contact:
☐

Map
Menu
Favorites
Switch to

Esc [Input field] Accept

TSC2 Access WiFi

Observed control point

Auto store point: ☒ Quality control: **QC 1 & QC 2** 100%

RTK

Number of measurements:

Precision

Auto tolerance: ☒

Map
Menu
Favorites
Switch to

1/2

Esc Accept

New job: CRTN-PRES

Job name: Template: **ZONE 6 (OC. R/V. SAN D. IMP)**

Properties

Coord. sys.: **California Zone 6 0406 (US Sta**

Units (Dist.): **US survey feet**

Linked files: **None**

Active map: **None**

Feature library: **None**

1/2

Esc Accept

Observed control point

Postprocess

Time for 4 SVs: Time for 5 SVs:

Time for 6+ SVs:

Map
Menu
Favorites
Switch to

2/2

Esc Accept

New job

Cogo settings: **Ground**

Descriptions: **Off**

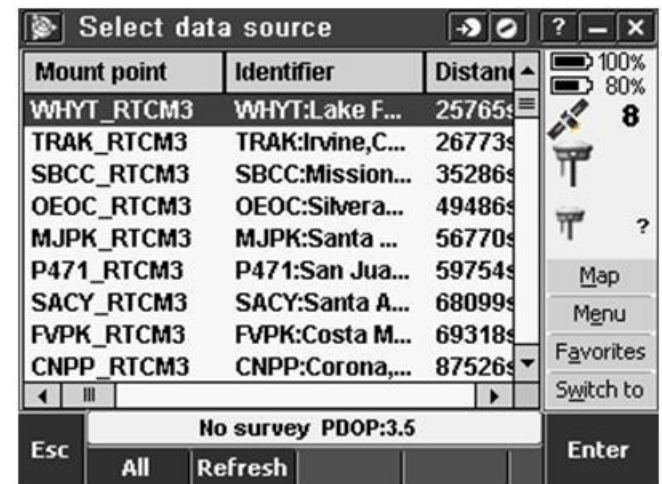
Media file: **Previous point**

Reference: Description: Operator: Notes:

2/2

Esc Accept

TSC2 Access WiFi



Samples / Questions

- ▶ Connection Configuration Database
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