

Radio Test Procedure – Configuration A

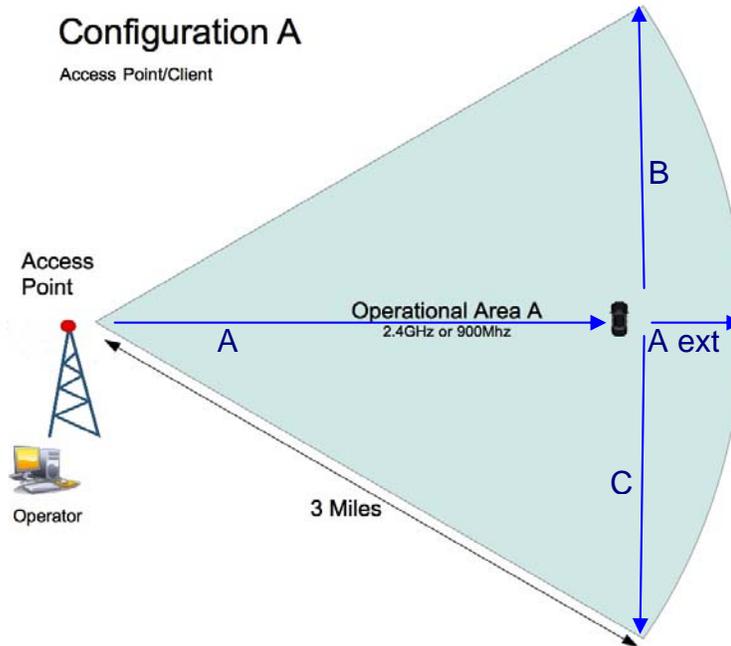


Figure 1: Radio Configuration A

Requirements

- Vehicle with ability to power a Pronto4
- Video overlay module setup with radio testing configuration
- Pronto4 roof rack with camera and appropriate cables
- OCU Laptop
- 2 walkie-talkie radios
- Blue Sky Mast
- Generator (West Desert testing only)
- 120° sector antenna
- 5dBi omni-directional antenna
- Radio labeled “Access Point”
- Radio labeled “Client”
- CBL-090-05, 5 feet coax cable
- CBL-079, Pronto4 Ethernet cable with two CPC connectors
- CBL-088-30, Weather tight Ethernet cable
- POE module
- 10 foot Standard Ethernet cable



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Generic Test Location

Complete the “Radio Test Results – Configuration A” form where appropriate.

1. Attach a 120° sector antenna to the top of the main tower.
2. Connect the weather tight Ethernet cable (CBL-088-30) to the radio labeled “Access Point”.
3. Attach the radio labeled “Access Point” (AP) to the main tower.
4. Attach a coax cable between the sector antenna and the AP radio.
5. Stand up the main tower and point the sector antenna to the middle of the operational area.
6. Connect the other end of the Ethernet cable (CBL-088-30) to the port on the AC power over Ethernet (POE) injector labeled “Data+Power”.
7. Connect a standard Ethernet cable (10 foot Ethernet cable) to the port on the AC POE injector labeled “Data”.
8. Connect the other end of the standard Ethernet cable (10 foot Ethernet cable) to the Ethernet port on the laptop.
9. Configure the IP address of the laptop to “192.168.200.30” with a netmask of “255.255.0.0”
10. Connect the POE to AC power. Verify that the power LED is illuminated.
11. Attach the 5dBi omni antenna to the radio labeled "Client" using a right angle N-type adapter. The antenna should be mounted to the radio in such a way that it will stand vertical when the radio is installed on the vehicle.
12. Mount the radio roof rack to the top of the Pronto4.
13. Connect the weather tight end of the Pronto4 Ethernet cable (CBL-079) to the radio.
14. Connect the other end of the Ethernet cable (CBL-079) on the Pronto4.
15. Install the Video Overlay Module that has the radio testing configuration into an empty bay of the Pronto4. If there is a video overlay module already installed replace it with the test module.
16. Connect the camera cable to the camera and the other end to the video overlay module.
17. Power on the Pronto4. Verify that the radio is booting.
18. From the laptop at the main tower, ping the IP address of the video overlay module. This can be done via the Windows Start button then the “Run...” option. At the command line enter “ping /t 192.168.200.232”.
19. Once the ping is successful, open up Internet Explorer and navigate to “192.168.200.232”, the IP address of the video module.
20. Verify that the video from the vehicle is displayed in the browser window.



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21. Verify that the clock displayed in the top line of the video is moving without skipping or halting. Transitions of both the milliseconds and seconds should move smoothly. Also, verify that the video quality is at least a drivable quality.
22. Park the vehicle next to the main tower, on a trajectory facing away from the tower but pointed in the direction of the sector antenna.
23. Reset the trip odometer on the vehicle.
24. From the OCU, monitor the transmission quality using the clock overlay and the general quality of the video. Verify that the clock displayed in the top line of the video is moving without skipping or halting and that the video quality is at least a drivable quality.
25. Drive the vehicle down range from the main tower 3 miles at a speed not to exceed 30MPH (i.e., path "A" in Figure 1). The OCU operator will alert the vehicle driver if the video quality degrades before the vehicle reaches the 3 mile mark.
26. If the vehicle successfully reaches the 3 mile mark with no loss of video quality, the driver should continue to drive until the OCU operator signals that the video quality has degraded (i.e., path "A ext" in Figure 1). This distance should be recorded on the Radio Test Results form.
27. The vehicle operator will return to the 3 mile mark, reset the vehicle's trip odometer, turn the vehicle to the right 90°, and, if possible, drive perpendicular to the previous path for 1.5 miles at a speed not to exceed 30MPH (i.e., path "B" in Figure 1). Verify that the clock displayed in the top line of the video is moving without skipping or halting and that the video quality is at least a drivable quality. The drop-off distance should be recorded on the Radio Test Results form.
28. The vehicle operator will return to the 3 mile mark, reset the vehicle's trip odometer, and, if possible, continue to drive, perpendicular to the original path, for 1.5 miles at a speed not to exceed 30MPH (i.e., path "C" in Figure 1). Verify that the clock displayed in the top line of the video is moving without skipping or halting and that the video quality is at least a drivable quality. The drop-off distance should be recorded on the Radio Test Results form.



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Kairos Office

Complete the “Radio Test Results – Configuration A” form where appropriate.

1. Attach the 120° sector antenna to the mast on the roof.
2. Connect the weather tight Ethernet cable to the radio labeled “Access Point”.
3. Attach the radio labeled “Access Point” (AP) to the main tower.
4. Attach a coax cable between the sector antenna and the AP radio.
5. Point the sector antenna so that it points west along 8360 South.
6. In the lab, connect the other end of the black Ethernet cable to the port on the AC POE injector labeled “Data+Power”.
7. Connect a standard Ethernet cable (10 foot Ethernet cable) to the port on the AC POE injector labeled “Data”.
8. Connect the other end of the standard Ethernet cable (10 foot Ethernet cable) to the Ethernet port on the laptop.
9. Configure the IP address of the laptop to “192.168.200.30” with a netmask of “255.255.0.0”.
10. Connect the POE to AC power. Verify that the access point radio power LED is illuminated.
11. Attach the 5dBi omni antenna to the radio labeled "Client" using a right angle N-type adapter. Antenna should be mounted to the radio in such a way that it will stand vertical when the radio is installed on the vehicle.
12. Mount the radio roof rack to the top of the vehicle with the Pronto4 installed.
13. Connect the weather tight end of the Pronto4 Ethernet cable (CBL-079) to the radio.
14. Connect the other end of the Ethernet cable (CBL-079) to the Pronto4.
15. Install the video overlay module that has the radio testing configuration.
16. Connect the camera cable to the camera and the other end to the video overlay module.
17. Power on the Pronto4. Verify that the client radio LED is illuminated.
18. From the laptop in the lab, ping the IP address of the video overlay module. This can be done via the Windows Start button then the “Run...” option. At the command line enter “ping /t 192.168.200.232”.
19. Once the ping is successful, open up Internet Explorer and navigate to “192.168.200.232”, the IP address of the video server.
20. Verify that the video from the vehicle is displayed in the browser window.
21. Verify that the clock displayed in the top line of the video is moving without skipping or halting. Transitions of both the milliseconds and seconds should move smoothly. Also, verify that the video quality is at least a drivable quality.



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22. While the operator watches the video from the laptop in the lab, the vehicle operator will drive the vehicle away from the office complex west towards Allen street (See Appendix D). Video should be drivable on the green path of Appendix D.
23. Turn south on Allen Street towards Sandy Parkway. Cross Sandy Parkway and go into the parking lot. The OCU operator will let the vehicle operator know when video is lost. The OCU operator will also note drop-off points on the Radio Test Results form.
24. From the parking lot, travel back across Sandy Parkway, on to Allen Street and back to the lab. The operator in the lab will alert the vehicle operator when video is restored.
25. The vehicle operator will then travel south on 8360 South until the road goes into the parking lot of General Dynamics. Operator in the lab will alert the vehicle operator if video is lost.



West Desert

Complete the “Radio Test Results – Configuration A” form where appropriate.

1. Driving directions are included in Appendix A.
2. Attach a 120° sector antenna to the top of the Blue Sky mast
3. Attach a coax cable to the sector antenna.
4. Stand up the Blue Sky mast at the corner of Grayback Hills road and the frontage road (See Appendix B). If that site is not available, use the alternate site as detailed in Appendix B.
5. Point the sector antenna north down Grayback Hills road.
6. Attach the radio labeled “Access Point” to the Blue Sky mast tripod.
7. Connect the weather tight Ethernet cable (CBL-088-30) to the radio labeled “Access Point”.
8. Connect the other end of the Ethernet cable (CBL-088-30) to the port on the AC POE injector labeled “Data+Power”.
9. Connect a standard Ethernet cable (10 foot Ethernet cable) to the port on the AC POE injector labeled “Data”.
10. Connect the other end of the standard Ethernet cable (10 foot Ethernet cable) to the Ethernet port on the laptop.
11. Configure the IP address of the laptop to “192.168.200.30” with a netmask of “255.255.0.0”.
12. Start up the generator and connect the POE to AC power. Verify that the access point radio is booting up.
13. Attach the 5dBi omni antenna to the radio labeled "Client" using a right angle N-type adapter. The antenna should be mounted to the radio in such a way that it will stand vertical when the radio is installed on the vehicle.
14. Mount the radio roof rack to the top of the vehicle with the Pronto4 installed.
15. Connect the weather tight end of the Pronto4 Ethernet cable (CBL-079) to the vehicle radio.
16. Connect the other end of the Ethernet cable (CBL-079) to the Pronto4.
17. Install the video overlay module that has the radio testing configuration.
18. Connect the camera cable to the camera and the other end to the video overlay module.
19. Power on the Pronto4. Verify that the radio is booting.
20. From the laptop in the lab, ping the IP address of the video overlay module. This can be done via the Windows Start button then the “Run...” option. At the command line enter “ping /t 192.168.200.232”.
21. Once the ping is successful, open up Internet Explorer and navigate to “192.168.200.232”, the IP address of the video overlay module



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22. Verify that the video from the vehicle is displayed in the browser window.
23. Verify that the clock displayed in the top line of the video is moving without skipping or halting. Transitions of both the milliseconds and seconds should move smoothly. Also, verify that the video quality is at least a drivable quality.
24. Park the vehicle next to the main tower, on a trajectory facing away from the tower but pointed in the direction of the sector antenna.
25. Reset the trip odometer on the vehicle.
26. From the OCU, monitor the video quality using the clock overlay and the general quality of the video.
27. Drive the vehicle down range from the main tower 3 miles (i.e., path "A" in Figure 1). The OCU operator will alert the vehicle driver if the video quality degrades before the vehicle reaches the 3 mile mark.
28. If the vehicle successfully reaches the 3 mile mark with no loss of video quality, the driver should continue to drive until the OCU operator signals that the video quality has degraded (i.e., path "A ext" in Figure 1). This distance should be recorded on the Radio Test Results form.
29. The vehicle operator will return to the 3 mile mark, reset the vehicle's trip odometer, turn the vehicle to the right 90°, and, if possible, drive perpendicular to the previous path for 1.5 miles at a speed not to exceed 30MPH. Verify that the clock displayed in the top line of the video is moving without skipping or halting and that the video quality is at least a drivable quality. The drop-off distance should be recorded on the Radio Test Results form.
30. The vehicle operator will return to the 3 mile mark, reset the vehicle's trip odometer, and, if possible, continue to drive, perpendicular to the original path, for 1.5 miles at a speed not to exceed 30MPH. Verify that the clock displayed in the top line of the video is moving without skipping or halting and that the video quality is at least a drivable quality. The drop-off distance should be recorded on the Radio Test Results form.



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Radio Test Results – Configuration A

Date: _____
 Location of test: _____
 Radio frequency: _____
 Total distance from tower, straight _____ miles
 Total distance left from 3 mile mark _____ miles
 Total distance right from the 3 mile mark _____ miles
 Vendor: _____
 Part number: _____
 Serial number: _____
 Tested by: _____



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Appendix A: Driving directions to West Desert test site

Directions to Grayback Hills Dr, UT
 89.7 mi – about 1 hour 25 mins

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- Head **west** on **W 8360 S** toward **Allen St**
 go 0.1 mi
 total 0.1 mi
- W 8360 S** turns left and becomes **Allen St**
 go 0.1 mi
 total 0.2 mi
- Turn left onto **S 450 W/Sandy Pkwy**
 About 2 mins
 go 0.8 mi
 total 1.0 mi
- Take the 1st left onto **W 9000 S**
 About 1 min
 go 0.2 mi
 total 1.2 mi
- Take the **Interstate 15 N** ramp on the left
 About 1 min
 go 0.4 mi
 total 1.6 mi
- Merge onto **I-15 N**
 About 10 mins
 go 11.5 mi
 total 13.1 mi
- Keep right to continue on **I-80 W**, follow signs for **Reno/S.L. International Airport**
 About 58 mins
 go 70.4 mi
 total 83.6 mi
- Take exit **49** toward **Clive**
 About 45 secs
 go 0.4 mi
 total 83.9 mi
- Turn right toward **Frontage Road**
 go 164 ft
 total 84.0 mi
- Take the 1st left onto **Frontage Road**
 About 8 mins
 go 4.6 mi
 total 88.6 mi
- Turn right onto **Grayback Hills Drive**
 Destination will be on the right.
 About 3 mins
 go 1.1 mi
 total 89.7 mi

Grayback Hills Dr, UT

These directions are for planning purposes only. You may find that construction projects, traffic, weather, or other events may cause conditions to differ from the map results, and you should plan your route accordingly. You must obey all signs or notices regarding your route.
 Map data ©2013 Google



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Appendix B: West Desert Test Locations





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Appendix C: West Desert's Blue Sky Mast location





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Appendix D: Vehicle Path – Kairos

