
Communications Van

Technical Acceptance Test Plan

Office of Emergency Services
City of Cupertino

Date: 25 February 2012

Version: 1.2

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Revision History

| Date | Revision | Notes |
|-----------|----------|--|
| 2/17/2012 | 1.0 | Original |
| 2/20/2012 | 1.1 | Added (27) Test Summary and (28) Issues List pages |
| 2/25/2012 | 1.2 | Revised Test #25, Radio Interference Test based on actual test procedure |

1. Introduction

This acceptance test plan (ATP) is designed to check the technical aspects of the work performed by Telepath Inc on the Cupertino Communications Van.

1.1. Strategy

The test strategy is three-fold.

1. Technical. To be performed by Cupertino Amateur Radio Emergency Service (CARES), this portion of the test will check out all installed systems and identify any gaps.
2. Structural. To be performed by the Cupertino City Services Staff , this portion of the test will check out how the van was overall constructed: mast mounts, internal cabinetry, etc.
3. Final acceptance. To be performed by CARES and the City Services Staff, this is the final review before Cupertino takes position of the van.

1.2. Purpose of this document

This document describes the Technical portion of the ATP. It will be used by CARES during the on-site review at Telepath to guide the technical check-out.

1.3. Tools required for the Technical ATP

The following tools will be required to support the test.

1. Volt Ohm Meter
2. Antenna Analyzer
3. 120VAC Outlet tester
4. 12VDC outlet tester
5. Length of CAT5 cable
6. PC, network enabled, capable of operating packet
7. TNC, TNC-to-Alinco cable, serial cable
8. 25 ft tape measure

2. Inventory Inspection

| | |
|-------------------------|---|
| Test Description | Confirm all contracted components are installed |
| Performed by | |
| Test Date/Time | |
| Test Results | |

2.1. Purpose

Locate the installed components per the 3 Telepath Quotes.

2.2. Procedure Steps

2.2.1. Set up

1. None

2.2.2. Proceed

2. Review the contents of the table, next page. Confirm all physical components are present.

2.2.3. Wrap up

3. None

2.3. Notes

Telepath Installation List

| Ref | Quote | Print Date | Line Item | Sub Line | Category | Item | Deliverable | Observations, Notes |
|-----|--------|---------------------|-----------|----------|----------------|------------|--|---------------------|
| 1 | 148341 | 8/24/2011 9:22:02AM | 1 | 0 | n/a | 0.Title | CARES Trailer project | |
| 2 | 148341 | 8/24/2011 9:22:02AM | 2 | 0 | Misc | LaborField | Labor | |
| 3 | 148341 | 8/24/2011 9:22:02AM | 2 | 1 | Power, Supply | LaborField | rewire generator and electrical | |
| 4 | 148341 | 8/24/2011 9:22:02AM | 2 | 2 | Cabinets | LaborField | Install new writing surfaces (laminated and writable cabinet doors) stations | |
| 5 | 148341 | 8/24/2011 9:22:02AM | 2 | 3 | Power, Outlet | LaborField | Install 1 dual 110Vac outlet at each station, | |
| 6 | 148341 | 8/24/2011 9:22:02AM | 2 | 4 | Power, Outlet | LaborField | Install 1-dual Powerpole Outlet Cover plate [at each station] | |
| 7 | 148341 | 8/24/2011 9:22:02AM | 2 | 5 | Net | LaborField | Install 1 Ethernet jack [at each station] | |
| 8 | 148341 | 8/24/2011 9:22:02AM | 2 | 6 | Lighting | LaborField | Install overhead LED light [at each station] | |
| 9 | 148341 | 8/24/2011 9:22:02AM | 2 | 7 | Lighting | LaborField | Install 4 over-head LED overhead lights for the center isle of the van | |
| 10 | 148341 | 8/24/2011 9:22:02AM | 2 | 8 | Power, Control | LaborField | Install 110VAC power distribution, | |
| 11 | 148341 | 8/24/2011 9:22:02AM | 2 | 9 | Power, Control | LaborField | Install 12VDC power distribution, | |
| 12 | 148341 | 8/24/2011 9:22:02AM | 2 | 10 | Radio | LaborField | Install 1 TV | |
| 13 | 148341 | 8/24/2011 9:22:02AM | 2 | 11 | Radio | LaborField | Install 6 Ham Radios | |
| 14 | 148341 | 8/24/2011 9:22:02AM | 2 | 12 | Antenna | LaborField | Install 34ft motorized mast | |
| 15 | 148341 | 8/24/2011 9:22:02AM | 2 | 13 | Power, Supply | LaborField | Install shore power charging system | |
| 16 | 148341 | 8/24/2011 9:22:02AM | 2 | 14 | Power, Outlet | LaborField | Create 5 qty "Anderson-to-FEMALE CLA" 12V pigtail adapters | |

| Ref | Quote | Print Date | Line Item | Sub Line | Category | Item | Deliverable | Observations, Notes |
|-----|--------|---------------------|-----------|----------|----------------|---------------|---|---------------------|
| 17 | 148341 | 8/24/2011 9:22:02AM | 2 | 15 | Power, Outlet | LaborField | Anderson style plugs supplied by customer. | |
| 18 | 148341 | 8/24/2011 9:22:02AM | 2 | 16 | Test | LaborField | Test for proper operation | |
| 19 | 148341 | 8/24/2011 9:22:02AM | 2 | 17 | Docs | LaborField | Create As-Built docs. | |
| 20 | 148341 | 8/24/2011 9:22:02AM | 2 | 18 | Misc | LaborField | 1 year warranty on all equipment and workmanship. | |
| 21 | 148341 | 8/24/2011 9:22:02AM | 3 | 0 | Lighting | PSC0CDCR | Purchase 6 DIODE COMPARTMENT LIGHT (white) | |
| 22 | 148341 | 8/24/2011 9:22:02AM | 4 | 0 | Cabinets | MiscPartsSale | Wood (laminat) writing surface, cabinets, electrical conduit, outlets, circuit breakers and full wrap interior thin carpet and walk way flooring. | |
| 23 | 148341 | 8/24/2011 9:22:02AM | 5 | 0 | Power, Control | MiscPartsSale | Blue Sea 3082 DC 10 Position Toggle Branch Circuit Breaker Panel. Includes wiring to devices. | |
| 24 | 148341 | 8/24/2011 9:22:02AM | 6 | 0 | Power, Control | MiscPartsSale | [Installation] | |
| 25 | 148341 | 8/24/2011 9:22:02AM | 6 | 1 | Power, Control | MiscPartsSale | All positive, negative and grounding buses installed, fully pre-wired | |
| 26 | 148341 | 8/24/2011 9:22:02AM | 6 | 2 | Power, Control | MiscPartsSale | Includes set of 30 common DC labels | |
| 27 | 148341 | 8/24/2011 9:22:02AM | 6 | 3 | Power, Control | MiscPartsSale | Label backlighting pre-installed | |
| 28 | 148341 | 8/24/2011 9:22:02AM | 6 | 4 | Lighting | MiscPartsSale | All LEDs installed | |
| 29 | 148341 | 8/24/2011 9:22:02AM | 6 | 5 | Docs | MiscPartsSale | Detailed installation instructions and cutout template | |
| 30 | 148341 | 8/24/2011 9:22:02AM | 6 | 6 | Power, Control | MiscPartsSale | 8028, 8-16 Volt DC Micro Voltmeter | |
| 31 | 148341 | 8/24/2011 9:22:02AM | 6 | 7 | Power, | MiscPartsSale | 8041, 0-50 Amp DC Micro | |

| Ref | Quote | Print Date | Line Item | Sub Line | Category | Item | Deliverable | Observations, Notes |
|-----|--------|---------------------|-----------|----------|----------------|---------------|---|---------------------|
| | | | | | Control | | Ammeter | |
| 32 | 148341 | 8/24/2011 9:22:02AM | 6 | 8 | Power, Control | MiscPartsSale | Owner upgradeable to 24 Volts DC with 8243, 10-32 Volt DC Micro Voltmeter | |
| 33 | 148341 | 8/24/2011 9:22:02AM | 6 | 9 | Power, Control | MiscPartsSale | 7 15A Single Pole circuit Breakers | |
| 34 | 148341 | 8/24/2011 9:22:02AM | 7 | 0 | Power, Supply | 0918912SKIT | Auto Charger 4000 with Ejector Kit | |
| 35 | 148341 | 8/24/2011 9:22:02AM | 8 | 0 | Power, Supply | 091200EZM | Mounting plate with Auto Charge 4000 | |
| 36 | 148341 | 8/24/2011 9:22:02AM | 9 | 0 | Power, Supply | 91185009 | Stainless steel mounting plate w/LED | |
| 37 | 148341 | 8/24/2011 9:22:02AM | 10 | 0 | Power, Supply | 09118921235D | Auto Charge precision Status center | |
| 38 | 148341 | 8/24/2011 9:22:02AM | 11 | 0 | Power, Supply | 91139212 | Auto Isolator 1 kit includes controller | |
| 39 | 148341 | 8/24/2011 9:22:02AM | 12 | 0 | Power, Supply | TR12012 | 12v 120amp AGM Battery includes custom fabricated mounts. | |
| 40 | 148341 | 8/24/2011 9:22:02AM | 13 | 0 | Radio | Prosetelite6 | Proset 6- dual ear muff with boom mic | |
| 41 | 148341 | 8/24/2011 9:22:02AM | 14 | 0 | Radio | AD1KM | Adapter for Kenwood Mobile | |
| 42 | 148341 | 8/24/2011 9:22:02AM | 15 | 0 | Radio | FS3 | Heavy duty footswitch | |
| 43 | 148341 | 8/24/2011 9:22:02AM | 16 | 0 | Antenna | SBB2 | ANTENNA (DUAL BAND) So-239 Mount 18" -1 for each radio and 1 spare with a loose antenna coax pigtail for front driver side communication. | |
| 44 | 148341 | 8/24/2011 9:22:02AM | 17 | 0 | Radio | PG-5G | PROGRAMMING INTERFACE CABLE FOR TM-D710A FREE SOFTWARE IS #MCP-2A on the internet. | |

| Ref | Quote | Print Date | Line Item | Sub Line | Category | Item | Deliverable | Observations, Notes |
|-----|--------|---------------------|-----------|----------|---------------|---------------|--|---------------------|
| 45 | 148341 | 8/24/2011 9:22:02AM | 18 | 0 | Antenna | MiscPartsSale | DUAL BAND 2M/220MHZ antenna whip (NMO STYLE) | |
| 46 | 148341 | 8/24/2011 9:22:02AM | 19 | 0 | Antenna | D130J | Discone All Band Antenna -For the customer supplied scanner. | |
| 47 | 148341 | 8/24/2011 9:22:02AM | 20 | 0 | Power, Supply | 379957 | Samlex Pure Sinewave Inverter 2000/4000W | |
| 48 | 148341 | 8/24/2011 9:22:02AM | 21 | 0 | Power, Supply | 36883 | Remote on/off switch for Samlex inverter | |
| 49 | 148341 | 8/24/2011 9:22:02AM | 22 | 0 | Radio | MiscPartsSale | Flatscreen 20" LED TV with flat wall mount and outdoor low profile off-air antenna | |
| 50 | 148341 | 8/24/2011 9:22:02AM | 23 | 0 | Antenna | 425701 | CNT-195 Low Loss Cable. [250ft jo] | |
| 51 | 148341 | 8/24/2011 9:22:02AM | 24 | 0 | Antenna | Info | 250ft | |
| 52 | 148341 | 8/24/2011 9:22:02AM | 25 | 0 | Antenna | CPL9C | PL259 Male Rg58 Connector | |
| 53 | 148341 | 8/24/2011 9:22:02AM | 26 | 0 | Antenna | QW470 | Antenna 1/4 Wave 470-490 Mhz - for City of Cupertino Radio | |
| 54 | 148341 | 8/24/2011 9:22:02AM | 27 | 0 | Net | MiscPartsSale | 8 port Industrial grade Ethernet 10/100/1000 switch. 4 jacks (1 per position) | |
| | | | | | x | | | |
| 55 | 148524 | 8/24/2011 9:13:45AM | 1 | 0 | n/a | 0.Title | CARES TRAILER RADIO GEAR | |
| 56 | 148524 | 8/24/2011 9:13:45AM | 2 | 0 | Antenna | MiscPartsSale | 34' telescoping motorized antenna mast with top section base for antennas. Tucked height of 7'8". Includes 12VDC power wench, safety auto-stop limiter and a 2ft X 2ft removable top plate for antennas. | |
| 57 | 148524 | 8/24/2011 9:13:45AM | 3 | 0 | Radio | TM-D710A | KENWOOD HAM RADIO 2M-440 | |

| Ref | Quote | Print Date | Line Item | Sub Line | Category | Item | Deliverable | Observations, Notes |
|-----|--------|----------------------|-----------|----------|----------|--------------|--|---------------------|
| | | | | | | | WITH APRS | |
| 58 | 148524 | 8/24/2011 9:13:45AM | 4 | 0 | Misc | GPS18PC | GPS UNIT (WITH RS232 OUTPUT) | |
| 59 | 148524 | 8/24/2011 9:13:45AM | 5 | 0 | Misc | G5 | GPS DISPLAY | |
| 60 | 148524 | 8/24/2011 9:13:45AM | 6 | 0 | Radio | DR235 | Sup | |
| 61 | 148524 | 8/24/2011 9:13:45AM | 7 | 0 | Radio | TK8180HK | 450-512MHz 45W 512 Ch/128 Zones CONV-LTR - High Powered City of Cupertino Radio | |
| 62 | 148524 | 8/24/2011 9:13:45AM | 8 | 0 | Radio | IC7000 | Icom 7000 Mobile HF Radio | |
| 63 | 148524 | 8/24/2011 9:13:45AM | 9 | 0 | Antenna | ICAH4 | 80M-6M 120W auto Tuner for IC7000 | |
| 64 | 148524 | 8/24/2011 9:13:45AM | 10 | 0 | Antenna | ICAH2B | HF Mobile antenna | |
| | | | | | x | | | |
| 65 | 148996 | 10/6/2011 11:47:12AM | 1 | 0 | n/a | 0.Title | ADD-ON to CARES VAN. | |
| 66 | 148996 | 10/6/2011 11:47:12AM | 2 | 0 | Radio | Header | Low Band (RING DOWN RADIO) | |
| 67 | 148996 | 10/6/2011 11:47:12AM | 3 | 0 | Radio | AAM25CKD9AA2 | Motorola Cdm1250 36-50Mhz 60Watts 64 Channels. | |
| 68 | 148996 | 10/6/2011 11:47:12AM | 4 | 0 | Misc | HKN9327 | Ignition Switch Cable | |
| 69 | 148996 | 10/6/2011 11:47:12AM | 5 | 0 | Antenna | RAB4003ARB | Antenna 36-42Mhz | |
| 70 | 148996 | 10/6/2011 11:47:12AM | 6 | 0 | Radio | AAHHLN4182 | Dtmf Decode Board | |
| 71 | 148996 | 10/6/2011 11:47:12AM | 7 | 0 | Radio | RLN4823 | Mobile Option Board Instal Kit | |
| 72 | 148996 | 10/6/2011 11:47:12AM | 8 | 0 | Radio | ProgramExp | Programming Expanded (new radio) includes installation and test of DTMF ring-down board. | |
| 73 | 148996 | 10/6/2011 11:47:12AM | 9 | 0 | Radio | Install | Installation of Low Band radio | |
| 74 | 148996 | 10/6/2011 11:47:12AM | 10 | 0 | n/a | 0.Break | ***** | |
| 75 | 148996 | 10/6/2011 11:47:12AM | 11 | 0 | Misc | Header | PA SYSTEM WITH SPEAKER | |

| Ref | Quote | Print Date | Line Item | Sub Line | Category | Item | Deliverable | Observations, Notes |
|-----|--------|----------------------|-----------|----------|---------------|---------------|---|---------------------|
| 76 | 148996 | 10/6/2011 11:47:12AM | 12 | 0 | Misc | PAP112 | Whelen PA/Air Horn Incl. Microphone | |
| 77 | 148996 | 10/6/2011 11:47:12AM | 13 | 0 | Misc | SA315P | 123dB Speaker, Nylon Composite | |
| 78 | 148996 | 10/6/2011 11:47:12AM | 14 | 0 | Misc | SAK1 | SPEAKER MOUNT KIT UNIVERSAL | |
| 79 | 148996 | 10/6/2011 11:47:12AM | 15 | 0 | Misc | Install | Installation | |
| 80 | 148996 | 10/6/2011 11:47:12AM | 16 | 0 | n/a | 0.Break | ***** | |
| 81 | 148996 | 10/6/2011 11:47:12AM | 17 | 0 | Misc | Header | CAR ALARM FOR THE CARES VAN | |
| 82 | 148996 | 10/6/2011 11:47:12AM | 18 | 0 | Misc | MiscPartsSale | Viper 350HV Alarm | |
| 83 | 148996 | 10/6/2011 11:47:12AM | 19 | 0 | Misc | MiscPartsSale | Alarm Pins for each entry point of vehicle | |
| 84 | 148996 | 10/6/2011 11:47:12AM | 20 | 0 | Misc | Install | Installation | |
| 85 | 148996 | 10/6/2011 11:47:12AM | 21 | 0 | n/a | 0.Break | ***** | |
| 86 | 148996 | 10/6/2011 11:47:12AM | 22 | 0 | Misc | Header | BACK UP CAMERA FOR SAFETY | |
| 87 | 148996 | 10/6/2011 11:47:12AM | 23 | 0 | Misc | MiscPartsSale | Backup Camera | |
| 88 | 148996 | 10/6/2011 11:47:12AM | 24 | 0 | Misc | MiscPartsSale | 7" LCD 12volt Monitor for viewing the backup camera. | |
| 89 | 148996 | 10/6/2011 11:47:12AM | 25 | 0 | Misc | Install | Installation | |
| 90 | 148996 | 10/6/2011 11:47:12AM | 26 | 0 | n/a | 0.Break | ***** | |
| 91 | 148996 | 10/6/2011 11:47:12AM | 27 | 0 | Power, Outlet | Header | Speciality "Anderson style DC plugs" | |
| 92 | 148996 | 10/6/2011 11:47:12AM | 28 | 0 | Power, Outlet | MiscPartsSale | Anderson power jacks 12VDC. - labor \$125.00 included in original project cost. | |
| 93 | 148996 | 10/6/2011 11:47:12AM | 29 | 0 | n/a | 0.Break | ***** | |

| Ref | Quote | Print Date | Line Item | Sub Line | Category | Item | Deliverable | Observations, Notes |
|-----|--------|----------------------|-----------|----------|----------------|-----------|--|---------------------|
| 94 | 148996 | 10/6/2011 11:47:12AM | 30 | 0 | Power, Control | Header | REWIRING THE ACCY PANEL SWITCHES & CLEAN UP ENGINE COMPARTMENT UNDER THE HOOD. | |
| 95 | 148996 | 10/6/2011 11:47:12AM | 31 | 0 | Power, Control | LaborShop | Labor -In shop repair. 2.5 days to rewire, remove & add new switch panel on dash board for accessories. Includes removing all unused wires and parts under the hood. | |
| 96 | 148996 | 10/6/2011 11:47:12AM | 32 | 0 | n/a | 0.Break | ***** | |
| 97 | 148996 | 10/6/2011 11:47:12AM | 33 | 0 | Misc | Header | AMBER TRAFFIC ADVISOR LIGHT BAR. | |
| 98 | 148996 | 10/6/2011 11:47:12AM | 34 | 0 | Misc | TAM8348 | AMBER TRAFFIC ADVISOR LED, CNTL TACTLD1 48" SUPER LED. | |
| 99 | 148996 | 10/6/2011 11:47:12AM | 35 | 0 | Misc | Install | Install Traffic Advisor light bar | |
| | | | | | | | | |

3. Cabinet Operations

| | |
|-------------------------|--|
| Test Description | Check the installation and operation of the surfaces, cabinets, drawers, and other enclosures. |
| Performed by | |
| Test Date/Time | |
| Test Results | |

3.1. Purpose

This test checks the installation and operation of the surfaces, cabinets, drawers, and other enclosures. Door latches, slides, and pulls are confirmed operational.

3.2. Procedure Steps

3.2.1. Set up

1. none

3.2.2. Proceed

2. Inspect all surfaces.
3. Open and close all cabinets. Check all latching operations.
4. Record the results.

| Cabinet | Notes |
|----------------------------------|--------------|
| Work surfaces | |
| Overhead cabinets, driver side. | |
| Storage Cabinets, passenger side | |
| All drawers | |
| Work surface supports | |
| | |
| | |
| | |

5. Other tests performed:

3.2.3. Wrap up

6. None

3.3. Notes

4. Internal Lighting Functional Test

| | |
|-------------------------|---|
| Test Description | Confirm the operation of all internal lighting. |
| Performed by | |
| Test Date/Time | |
| Test Results | |

4.1. Purpose

Check that all isle and work surface lighting is operational.

4.2. Procedure Steps

4.2.1. Set up

1. Main 12VDC power breaker is on.
2. Dash Lighting Control switch is on.

4.2.2. Proceed

3. Confirm all internal isle lighting is operational.
4. Turn on and off all work surface lighting.
5. Record current reading from the 12VDC breaker panel for the lighting conditions as follows:

| Lighting | Voltage | Current | Notes |
|---------------------------------------|---------|---------|-------|
| All lights off | | | |
| Isle lights on | | | |
| Isle lights + Pos 1 | | | |
| Isle lights + Pos 2 | | | |
| Isle lights + Pos 3 | | | |
| Isle lights + Pos 4 | | | |
| Isle lights + Pos Supervisor | | | |
| Isle lights + All Operating Positions | | | |
| | | | |
| | | | |

6. Other tests performed:

4.2.3. Wrap up

7. none.

4.3. Notes

5. External Lighting Functional Test

| | |
|-------------------------|---|
| Test Description | Confirm the operation of all external lighting. |
| Performed by | |
| Test Date/Time | |
| Test Results | |

5.1. Purpose

Checks the operational performance of all isle and work surface lighting.

5.2. Procedure Steps

5.2.1. Set up

1. Main 12VDC power breaker is on.

5.2.2. Proceed

2. From the Dashboard power panel, turn each light on as follows:
3. Record current reading from the 12VDC breaker panel for the lighting conditions as follows (if applicable):

| Lighting | Voltage | Current | Notes |
|-----------------------------------|---------|---------|-------|
| Front Amber Traffic Advisor Light | | | |
| Rear Amber Traffic Advisor Light | | | |
| Left Front Flood Light | | | |
| Right Front Flood Light | | | |
| Left Rear Flood light | | | |
| Right Rear flood light | | | |
| Left roof remote floodlight | | | |
| Right roof remote floodlight | | | |
| All external lights on | | | |
| Brake Lights | | | |
| Rear red running lights | | | |

4. Other tests performed:

5.2.3. Wrap up

5. none

5.3. Notes

6. 120VAC Outlet Functional Test

| | |
|-------------------------|---|
| Test Description | Confirm the installation and operation of all 120VAC outlets. |
| Performed by | |
| Test Date/Time | |
| Test Results | |

6.1. Purpose

Check the wiring and operation of all outlets, both internal and external. This test requires a 120VAC outlet checker.

6.2. Procedure Steps

6.2.1. Set up

1. Ensure the van is on shore power.

6.2.2. Proceed

2. Turn on the 120VAC circuit breaker for the outlets.
3. Install the Outlet checker into each outlet, both top and bottom.
4. With the outlet checker in one outlet, turn the 120VAC breaker off and on. Verify power is turned off to each outlet.
5. Record the results:

| 120VAC Outlet locations | Test (pass/fail) | Notes |
|--------------------------|------------------|-------|
| Operating Position 1 | | |
| Operating Position 2 | | |
| Operating Position 3 | | |
| Operating Position 4 | | |
| Printer drawer | | |
| Supervisor position | | |
| External, driver side | | |
| External, passenger side | | |
| | | |
| | | |

6. Other tests performed:

6.2.3. Wrap up

7. none

6.3. Notes

7. 12VDC Outlet Functional Test

| | |
|-------------------------|--|
| Test Description | Confirm the installation and operation of all 12VDC outlets. |
| Performed by | |
| Test Date/Time | |
| Test Results | |

7.1. Purpose

Check the wiring and operation of all outlets. This test requires a volt meter or an Anderson PowerPole test fixture.

7.2. Procedure Steps

7.2.1. Set up

1. Ensure the 12VDC circuit breaker is on.

7.2.2. Proceed

2. Install the Outlet checker into each 12VDC outlet, both top and bottom.
3. With the outlet checker in one outlet, turn the 12VDC breaker off and on. Verify power is turned off to each outlet.
4. Record the results:

| 12VDC Outlet locations | Test (pass/fail) | Notes |
|------------------------|------------------|-------|
| Operating Position 1 | | |
| Operating Position 2 | | |
| Operating Position 3 | | |
| Operating Position 4 | | |
| Printer drawer | | |
| To shelf above TV | | |
| Supervisor position | | |
| Cab operating position | | |
| | | |
| | | |

5. Other tests performed:

7.2.3. Wrap up

6. none

7.3. Notes

8. Inverter Functional Test

| | |
|-------------------------|---|
| Test Description | Check the installation and operation of the 12VDC to 120VAC inverter. |
| Performed by | |
| Test Date/Time | |
| Test Results | |

8.1. Purpose

Confirm that the 12VDC to 120VAC inverter is operating correctly. This test requires that a 120VAC load to be connected.

8.2. Procedure Steps

8.2.1. Set up

1. Confirm the Batteries are fully charged.

8.2.2. Proceed

2. Plug in the 120VAC load into the inverter.
3. Turn the inverter on and off locally.
4. Turn the inverter on and off remotely.
5. With a VOM, record the inverter output voltage.
6. Plug in various 120VDC loads (at least one). Record the battery voltage and current.

| Load Description | Voltage | Current | Notes |
|------------------|---------|---------|-------|
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |

7. Other tests performed:

8.2.3. Wrap up

8. None.

8.3. Notes

9. Battery Charge Control Test

| | |
|-------------------------|---|
| Test Description | Confirm the installation and operation of all battery charge systems. |
| Performed by | |
| Test Date/Time | |
| Test Results | |

9.1. Purpose

Check the wiring and operation of the battery charge subsystem.

9.2. Procedure Steps

9.2.1. Set up

1. Position the vehicle in the sun.

9.2.2. Proceed

2. Confirm that the solar charger circuit is charging the batteries.
3. Plug in shore power. Confirm that the solar charger circuit is dis-engaged and the batter charger is charging the batteries.
4. Record the results:

| Point of observation | Test | Notes |
|----------------------|------|-------|
| Solar Charger | | |
| Shore Power | | |
| | | |
| | | |
| | | |
| | | |
| | | |

5. Other tests performed:

9.2.3. Wrap up

6. none

9.3. Notes

This system is not fully understood. We need to see the wiring diagrams for the charging subsystem. This test may need to be repeated or rewritten.

10. Battery Duration Test

| | |
|-------------------------|--|
| Test Description | Confirm the load sustainability of all battery system. |
| Performed by | |
| Test Date/Time | |
| Test Results | |

10.1. Purpose

Confirm the load sustainability of all battery system. This test requires that a standard operating load is created to test the useful life of the installed battery capacity.

10.2. Procedure Steps

10.2.1. Set up

1. Confirm the Batteries are fully charged.
2. Remove power to the battery charge system.

10.2.2. Proceed

3. Turn on all 12VDC loads – Lighting, radios, etc. Operate the radios requesting periodic radio checks to simulate transmission events.
4. Record the battery voltage and current over time:

| Time | Voltage | Current | Notes |
|---------|---------|---------|-------|
| 0 min | | | |
| 30 min | | | |
| 60 min | | | |
| 2 hours | | | |
| 3 hours | | | |
| 4 hours | | | |
| 5 hours | | | |
| 6 hours | | | |
| | | | |
| | | | |

5. Once discharged, record the time to recharge the batteries.
6. Other tests performed:

10.2.3. Wrap up

7. None.

10.3. Notes

11. On-board Generator Test

| | |
|-------------------------|-------------------------------|
| Test Description | Check out on-board generator. |
| Performed by | |
| Test Date/Time | |
| Test Results | |

11.1. Purpose

This test checks the operation of the generator. Other inspections may be performed as part of the Structural evaluation performed by the City.

11.2. Procedure Steps

11.2.1. Set up

1. Disconnect shore power.

11.2.2. Proceed

2. From the generator compartment, manually start the generator.
3. Plug in the Van into the Generator outlet and confirm all 120VDC systems are operational.
4. Turn off the generator.
5. From cab, remotely start the generator.
6. Other tests performed:

11.2.3. Wrap up

7. Reattach the antenna coax to the radio.

11.3. Notes

12. Network Functional Test

| | |
|-------------------------|---|
| Test Description | Confirm the installation and operation of the Network router. |
| Performed by | |
| Test Date/Time | |
| Test Results | |

12.1. Purpose

Confirm the installation and operation of the Network router. This test requires a CAT5 cable and a PC or other network-enabled device.

12.2. Procedure Steps

12.2.1. Set up

1. Confirm the Van is on shore power.

12.2.2. Proceed

2. Inspect the Router. Verify that its indicators are on and show normal operation.
3. On the first connection, record the configuration of the Wireless network.

Router Admin IP: _____

Logon, Password: _____

WAP Name: _____

4. Plug in the network cable into each LAN outlet. Verify that an IP address is assigned. Record the results:

| Outlets | Test (pass/fail) | Notes |
|----------------------|------------------|-------|
| Operating Position 1 | | |
| Operating Position 2 | | |
| Operating Position 3 | | |
| Operating Position 4 | | |
| Printer drawer | | |
| Supervisor position | | |
| Wireless connection | | |
| | | |
| | | |

5. Other tests performed:

12.2.3. Wrap up

6. None.

12.3. Notes

13. GPS Functional Test

| | |
|-------------------------|--|
| Test Description | Confirm the installation and operation of the Navigation GPS system. |
| Performed by | |
| Test Date/Time | |
| Test Results | |

13.1. Purpose

Confirm the installation and operation of the Navigation GPS system.

13.2. Procedure Steps

13.2.1. Set up

1. The Van has a clear view of the sky to lock on to GPS satellites.

13.2.2. Proceed

2. Power on the GPS.
3. Verify a satellite lock is achieved.
4. Verify the operation of the GPS display.
5. Take a drive test to confirm it is operational.
6. Other tests performed:

13.2.3. Wrap up

7. None.

13.3. Notes

14. Public Address Functional Test

| | |
|-------------------------|--|
| Test Description | Confirm the installation and operation of the PA system. |
| Performed by | |
| Test Date/Time | |
| Test Results | |

14.1. Purpose

Confirm the installation and operation of the Navigation PA system.

14.2. Procedure Steps

14.2.1. Set up

1. Caution: the PA can be loud.

14.2.2. Proceed

2. Power on the PA system.
3. Use the microphone to test a voice announcement.
4. Use the horn button to test the horn.
5. Other tests performed:

14.2.3. Wrap up

6. None.

14.3. Notes

15. Vehicle Alarm Functional Test

| | |
|-------------------------|---|
| Test Description | Confirm the installation and operation of the Vehicle Alarm system. |
| Performed by | |
| Test Date/Time | |
| Test Results | |

15.1. Purpose

Confirm the installation and operation of the Vehicle Alarm system.

15.2. Procedure Steps

15.2.1. Set up

1. None.

15.2.2. Proceed

2. Close all alarmed doors.
3. Arm the alarm system.
4. Open each armed door, one at a time. Confirm the alarm is initiated. Reset the alarm to continue with the test.

| Outlets | Test (pass/fail) | Notes |
|---------------------|------------------|-------|
| Driver Side door | | |
| Passenger Side door | | |
| Rear door | | |
| Hood | | |
| Generator enclosure | | |
| | | |
| | | |

5. Let one alarm go all the way to sounding the siren. Reset the alarm when done.
6. Other tests as necessary.

15.2.3. Wrap up

7. None.

15.3. Notes

16. Backup Camera Functional Test

| | |
|-------------------------|---|
| Test Description | Confirm the installation and operation of the Backup Camera system. |
| Performed by | |
| Test Date/Time | |
| Test Results | |

16.1. Purpose

Confirm the installation and operation of the Backup Camera system.

16.2. Procedure Steps

16.2.1. Set up

1. None.

16.2.2. Proceed

2. Turn on the backup camera.
3. Verify the focus and field of view of the camera.
4. Verify the camera is on when in all forward and reverse gears.
5. Other tests as necessary.

16.2.3. Wrap up

6. None.

16.3. Notes

17. Antenna Mast Functional Test

| | |
|-------------------------|--|
| Test Description | Confirm the installation and operation of the Mast system. |
| Performed by | |
| Test Date/Time | |
| Test Results | |

17.1. Purpose

Confirm the installation and operation of the Mast system.

17.2. Procedure Steps

17.2.1. Set up

1. The mast is fully retracted.

17.2.2. Proceed

2. Ensure the antenna mast cables are free and clear and not in a stowed position.
3. Raise the mast.
 - Confirm the mast stops when the upper limit switch is set.
 - Confirm the mast cables pay out correctly without tangles.
4. Lower the mast.
 - Confirm the mast stops when the lower limit switch is set.
 - Confirm the mast cables recover correctly without tangles.
5. Raise the mast. Engage the manual retract gearing to lower the mast.
6. With mast lowered
 - measure the overall height from the ground to the top most antenna.
 - inspect the method for securing the cable for storage and travel.
7. Other tests as necessary.

17.2.3. Wrap up

8. None.

17.3. Notes

18. Antenna SWR Test

| | |
|-------------------------|--|
| Test Description | Measure the SWR for each antenna installed on the Van. |
| Performed by | |
| Test Date/Time | |
| Test Results | |

18.1. Purpose

Tests the SWR of all cabling to and including the antenna. This test will be run once per installed antenna.

18.2. Procedure Steps

18.2.1. Set up

1. For each Antenna, remove the coax connector from the back of each radio.

18.2.2. Proceed

2. Attach the Antenna Analyzer to the coax.
3. Tune the analyzer for center band.
4. Record the measurement frequency and SWR. Do both 2m and 440 where applicable.

| Radio Position | Frequency | SWR Reading | Notes |
|--------------------|-----------|-------------|-------|
| Kenwood TM-710, #1 | | | |
| Kenwood TM-710, #2 | | | |
| Kenwood TM-710, #3 | | | |
| Kenwood TM-710, #4 | | | |
| Alinco DR-235 | | | |
| ICOM IC-7000 HF | | | |
| City Trunk Radio | | | |
| EOC Net Radio | | | |
| Scanner | | | |
| Dash Mount Radio | | | |

18.2.3. Wrap up

5. Reattach the antenna coax to the radio.

18.3. Notes

19. Television Reception Test

| | |
|-------------------------|---|
| Test Description | Check the installation and operation of the on-board Television system. |
| Performed by | |
| Test Date/Time | |
| Test Results | |

19.1. Purpose

Check the installation and operation of the on-board Television system

19.2. Procedure Steps

19.2.1. Set up

1. none

19.2.2. Proceed

2. On the roof, position the TV antenna for reception.
3. In the Van, turn on the TV monitor.
4. Tune in local over-air broadcast stations. Reposition the antenna as necessary to improve picture quality.
5. Record the stations we could receive.

| Station | Quality | Notes |
|---------|---------|-------|
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |

6. Other tests performed:

19.2.3. Wrap up

7. Lower the TV antenna to its stowed position.

19.3. Notes

20. Amateur Radio Voice Radio Functional Test

| | |
|-------------------------|---|
| Test Description | Check the installation and operation of the VHF, UHF, and HF radio. |
| Performed by | |
| Test Date/Time | |
| Test Results | |

20.1. Purpose

Check the installation and operation of all voice radio. Only operate one radio at a time.

20.2. Procedure Steps

20.2.1. Set up

1. none

20.2.2. Proceed

2. For each radio, turn on its appropriate 12VDC Circuit breaker.
3. For each radio, ensure the antenna cable is connected. Turn on the radio.
4. Tune to a local repeater frequency for a radio check.
5. Confirm the operation of each Headset.
6. Confirm the operation of each Foot switch.
7. Request a radio check with any station on frequency.
8. Record the results.

| Radio Position | Test (pass/fail) | Notes |
|--------------------|------------------|-------|
| Kenwood TM-710, #1 | | |
| Kenwood TM-710, #2 | | |
| Kenwood TM-710, #3 | | |
| Kenwood TM-710, #4 | | |
| ICOM IC-7000 HF | | |

9. Other tests performed:

20.2.3. Wrap up

10. none

20.3. Notes

21. City Trunk Radio Functional Test

| | |
|-------------------------|--|
| Test Description | Check the installation and operation of the City 450MHz radio. |
| Performed by | |
| Test Date/Time | |
| Test Results | |

21.1. Purpose

Check the installation and operation of the City voice radio. Only operate one radio at a time.

21.2. Procedure Steps

21.2.1. Set up

1. none

21.2.2. Proceed

2. Turn on its appropriate 12VDC circuit breaker.
3. Ensure the antenna cable is connected. Turn on the radio.
4. Request a radio check with City Service Center.
5. Record the results.

| Radio Position | Test | Notes |
|------------------|------|-------|
| City Trunk Radio | | |

6. Other tests performed:

21.2.3. Wrap up

7. none

21.3. Notes

22. County EOC Radio Functional Test

| | |
|-------------------------|---|
| Test Description | Check the installation and operation of the County EOC radio. |
| Performed by | |
| Test Date/Time | |
| Test Results | |

22.1. Purpose

Check the installation and operation of the City voice radio. Only operate one radio at a time.

22.2. Procedure Steps

22.2.1. Set up

1. none

22.2.2. Proceed

2. Turn on its appropriate 12VDC Circuit breaker.
3. Ensure the antenna cable is connected. Turn on the radio.
4. Request a radio check with County EOC, or any other responding station.
5. Request a ring-down request from a remote station.
6. Record the results.

| Radio Position | Test | Notes |
|------------------|------|-------|
| County EOC Radio | | |

7. Other tests performed:

22.2.3. Wrap up

8. none

22.3. Notes

23. Scanner Radio Functional Test

| | |
|-------------------------|--|
| Test Description | Check the installation and operation of the Scanner radio. |
| Performed by | |
| Test Date/Time | |
| Test Results | |

23.1. Purpose

Check the installation and operation of the Scanner radio.

23.2. Procedure Steps

23.2.1. Set up

1. none

23.2.2. Proceed

2. Turn on its appropriate 12VDC Circuit breaker.
3. Ensure the antenna cable is connected. Turn on the radio.
4. Tune to a local County Fire and County Sheriff frequency for monitoring. Verify the reception.
5. Monitor the channel.
6. Record the results.

| Radio Position | Test | Notes |
|----------------|------|-------|
| Scanner | | |

7. Other tests performed:

23.2.3. Wrap up

8. none

23.3. Notes

24. Packet Radio Functional Test

| | |
|-------------------------|---|
| Test Description | Check the installation and operation of 220 Packet radio. |
| Performed by | |
| Test Date/Time | |
| Test Results | |

24.1. Purpose

Check the installation and operation of the packet radio. This test requires a TNC, TNC-to-Alinco cable, serial cable, and a PC capable of operating packet.

24.2. Procedure Steps

24.2.1. Set up

1. none

24.2.2. Proceed

2. Turn on its appropriate 12VDC Circuit breaker.
3. Ensure the antenna cable is connected. Turn on the radio.
4. Connect the TNC and PC to the Packet Radio.
5. Set the frequency for a local packet BBS.
6. Send and receive a packet message.
7. Record the results.

| Radio Position | Test | Notes |
|----------------|------|-------|
| Alinco DR-235 | | |

8. Other tests performed:

24.2.3. Wrap up

9. none

24.3. Notes

25. Radio Interference Test (v2)

| | |
|-------------------------|--|
| Test Description | Measure the extent of the interference each radio will induce into each other. |
| Performed by | |
| Test Date/Time | |
| Test Results | |

25.1. Purpose

This test will show what we can expect when all radios are on, and we are ad-hoc operating on different bands and frequencies.

25.2. Procedure Steps

25.2.1. Set up

1. Turn on all radios.

25.2.2. Proceed

2. With all radios on their respective frequency, key up each radio. Record any interference received from other radios. Use other side of this sheet to record additional Comments.
3. Record the results.

| Check at Initiator | TM-710, #1 | TM-710, #2 | TM-710, #3 | TM-710, #4 | IDR235 | IC-7000 | City Trunk | Low Band | Scanner | Dash |
|-------------------------------------|------------|------------|------------|------------|--------|---------|------------|----------|---------|------|
| TM-710, #1 146.460, Pos1 | | | | | | | | | | |
| TM-710, #2 146.116, Pos 2 | | | | | | | | | | |
| TM-710, #3 147.570, Pos 3 | | | | | | | | | | |
| TM-710, #4 442.500, Sup | | | | | | | | | | |
| DR-235 222.630 | | | | | | | | | | |
| IC-7000 HF | | | | | | | | | | |
| City Trunk | | | | | | | | | | |
| EOC Low Band | | | | | | | | | | |
| Scanner | | | | | | | | | | |
| Dash Radio | | | | | | | | | | |

25.3. Notes

26. Documentation Inspection

| | |
|-------------------------|---|
| Test Description | Check for the presence of all documentation for installed components. |
| Performed by | |
| Test Date/Time | |
| Test Results | |

26.1. Purpose

This is a review of all manuals, drawings, diagrams, notes, and other documentation used in the construction of the vehicle.

26.2. Procedure Steps

26.2.1. Set up

1. none.

26.2.2. Proceed

2. Check the following

| Radio Position | Test | Notes |
|--|------|-------|
| Radio Manuals | | |
| Antenna manuals | | |
| Power distribution | | |
| Electrical drawings | | |
| Antenna Placement drawings | | |
| Mast manuals | | |
| Maintenance notes (ie: how to open access panels, etc) | | |
| Parts lists for procured, installed parts | | |
| | | |
| | | |
| | | |
| | | |

26.2.3. Wrap up

3. none

26.3. Notes

27. Test Summary

| Test | Test Date | In progress | Pass |
|---|------------------|--------------------|-------------|
| 2. Inventory Inspection | | | |
| 3. Cabinet Operations | | | |
| 4. Internal Lighting Functional Test | | | |
| 5. External Lighting Functional Test | | | |
| 6. 120VAC Outlet Functional Test | | | |
| 7. 12VDC Outlet Functional Test | | | |
| 8. Inverter Functional Test | | | |
| 9. Battery Charge Control Test | | | |
| 10. Battery Duration Test | | | |
| 11. On-board Generator Test | | | |
| 12. Network Functional Test | | | |
| 13. GPS Functional Test | | | |
| 14. Public Address Functional Test | | | |
| 15. Vehicle Alarm Functional Test | | | |
| 16. Backup Camera Functional Test | | | |
| 17. Antenna Mast Functional Test | | | |
| 18. Antenna SWR Test | | | |
| 19. Television Reception Test | | | |
| 20. Amateur Radio Voice Radio Functional Test | | | |
| 21. City Trunk Radio Functional Test | | | |
| 22. County EOC Radio Functional Test | | | |
| 23. Scanner Radio Functional Test | | | |
| 24. Packet Radio Functional Test | | | |
| 25. Radio Interference Test | | | |
| 26. Documentation Inspection | | | |

28. Issues List

| Issue# | Test# | Issue | Disposition |
|--------|-------|-------|-------------|
| | | | |

| Issue# | Test# | Issue | Disposition |
|---------------|--------------|--------------|--------------------|
| | | | |