



**Seattle Fire Prevention Division**

220 3rd Avenue South  
 Seattle, WA 98104  
 (206) 385-1450  
 SFD\_FMO\_SystemsTesting@seattle.gov

**SYSTEM TEST REPORT**  
**ACCEPTANCE TEST**

Please contact the PSERN project to arrange to borrow radios and schedule uplink testing several days prior to testing. Radio and testing information here: <https://psern.org/confidential-resources>

<b>Distributed Antenna Systems (DAS)</b>	<b>COMMISSIONING TEST RESULTS</b>	
	<input type="checkbox"/> Accepted/White Tagged	<input type="checkbox"/> Not Accepted
<b>Occupancy Information (All Fields Mandatory)</b>		
Building Name:	Building Address:	
Contact Name:	Contact Phone:	
Contact Address:	Contact Email:	
Central Station Monitoring: <input type="checkbox"/> Yes <input type="checkbox"/> No	Monitoring Required: <input type="checkbox"/> Yes <input type="checkbox"/> No	
Monitoring Company Name:	Monitoring Company Phone:	
<b>DAS Inventory (All Fields Mandatory)</b>		
Update inventory information below. For commissioning: All fields are mandatory. For annual test: enter any missing values using results from the current annual test, otherwise do not change commissioning values. Upload grid square diagrams and other information using upload feature at end of inventory. After leaving this page, you will not be able to edit inventory, except by creating a new report.		
System Make	System Model	
Design Firm of Record:	Electrical Permit Number:	
Location of System in Building:	Applicable Code & Year (e.g. SFC 2018):	
Is this a shared system (shared with cellular phone carriers and/or internal radios?)	<input type="checkbox"/> Yes	<input type="checkbox"/> No
Is this a fiber/active or a coax/passive system?	<input type="checkbox"/> Active	<input type="checkbox"/> Passive
PSERN Retune Completed? <input type="checkbox"/> Yes <input type="checkbox"/> No		
Antenna Type:		
ERP to Donor Site (dBm):  <i>Testing shall be done using a PSERN public safety radio held at face level and placed in transmit mode, transmitting within 3' of the antenna predicted to have the lowest loss to the BDA (based on distance from the BDA equipment). The output power of the BDA shall than be measured with a calibrated power meter or spectrum analyzer. Using the measured power, and the estimated feedline loss plus antenna gain, shall be used to calculate the Estimated Radiated Power (ERP).</i>		
Antenna Gain (dBd):		
Antenna Coordinates (NAD83):		
Antenna Azimuth (degrees true) (DAS vendor may select the antenna unless directed to a specific antenna by the PSERN project):		
Uplink Gain Setting:	Gain Setting:	db
	Power:	dbm
Downlink Gain Setting:	Gain Setting:	db
	Power:	dbm

Signal Level Received at Donor Site (-dBm): <i>The signal level received at the donor site shall be measured by the PSERN Project - see the DAS vendor information at <a href="https://psern.org/confidential-resources">https://psern.org/confidential-resources</a> City of Seattle Communications shop. You will also borrow radios from PSERN for your testing. A test signal shall be generated from a public safety radio held at face level and placed in transmit mode, transmitting within 3' of the antenna predicted to have the lowest loss to the BDA (based on distance from the BDA equipment).</i>	
Signal Level Received from Donor Site (-dBm): <i>Measure active control channel, w/20 KHz resolution bandwidth, at the jumper that connects to the DAS head-end donor port.</i>	
Channelized Donor Site Name (to be selected by the DAS vendor unless directed by the PSERN project to a specific donor site):	
Channelized or Broadband (Note: new broadband systems are not allowed in Seattle and will not be accepted on PSERN): <input type="checkbox"/> Channelized <input type="checkbox"/> Broadband	
List of Critical Areas in Building (for coverage testing requirements). Critical areas from NFPA 1221 are: the fire command center(s), the fire pump room(s), interior exit stairways, exit passageways, elevator lobbies, standpipe cabinets, sprinkler sectional valve locations, and other areas required by the fire code official.	
<b>Testing Company Information (All Fields Mandatory)</b>	
Company Name: Address:	Phone: Emergency Phone: Email:
<b>Technician/Tester Information (All Fields Mandatory)</b>	
Technician Name: Technician FCC Certification/GROL#: Technician performing testing has received approved certification and manufacturer training or other equivalent: <input type="checkbox"/> Yes Specify manufacturer training received and year: Training: _____ Yr: 20_____	
<b>Testing Equipment (All Fields Mandatory)</b>	
Spectrum analyzer make/model**: Spectrum analyzer calibration date: Calibration performed by firm (qualified firm name): ** Use of a calibrated spectrum analyzer, with a current calibration, is required for this testing.	
<b>Test Information (Mandatory)</b>	
Date of Test:	
The items on the checklists below shall be inspected and tested. This list does not constitute all of the required inspecting and testing requirements for BDA/DAS. Refer to the CURRENT FIRE CODE AND REFERENCED NFPA STANDARD and the MANUFACTURER'S INSTRUCTIONS for weekly, monthly, and/or quarterly inspecting and testing requirements.	
<b>PRE-TEST CHECKS</b>	
1	A copy of the completed Rebroadcast Agreement with PSERN is available in the emergency responder radio system enclosure. <input type="checkbox"/> Yes
2	Electrical permit is signed off. <input type="checkbox"/> Yes
3	A copy of the following documents is stored in the emergency responder radio system enclosure and/or the building engineer's office, and an additional copy has been provided to the City of Seattle's Radio System Manager (or the Puget Sound Emergency Radio Network [PSERN] Operator once PSERN has replaced the King County Radio System):

a.	Grid diagram for each floor, showing test signal strengths in each floor, and indicating location of each critical area. Include information on location of fire-resistance-rated pathways.	<input type="checkbox"/>	Yes
b.	A diagram showing location of BDA/DAS control equipment, amplifiers, signal boosters, backup battery systems, and any outdoor antennas, and a wiring schematic.	<input type="checkbox"/>	Yes
c.	Manufacturer specifications for all BDA/DAS systems components including amplifiers, signal boosters, antennas, coax, couplers, splitters, combiners, filters, or any other passive components included.	<input type="checkbox"/>	Yes
d.	Data sheets for the backup battery and charging system (if utilized), and include calculations to ensure the backup power requirements are met.	<input type="checkbox"/>	Yes
e.	A certification letter stating that the BDA/DAS has been installed and tested per code and that the system is complete and fully functional.	<input type="checkbox"/>	Yes
4	<b>Take precautions to avoid preventable alarms.</b> The Central Station Monitoring Service was notified that DAS testing is occurring and will be generating supervisory signals.	<input type="checkbox"/>	Yes
<b>ACTIVE COMPONENTS</b>			
5	Signal booster is within a NEMA 4, IP66-type waterproof cabinet or equivalent.	<input type="checkbox"/>	Yes
6	Battery is within a NEMA 3R, IP65-type waterproof cabinet or equivalent.	<input type="checkbox"/>	Yes
7	Equipment is FCC certified.	<input type="checkbox"/>	Yes
8	Active components checked to verify operation within manufacturers' specifications:		
a.	Equipment alarm log checked for recurring or substantial alarms and addressed as per manufacturer's recommendations.	<input type="checkbox"/>	Yes
b.	Isolation testing performed and measured system isolation is at least 20 db above the total downlink and the total uplink gain (whichever is greater) between least isolated DAS antenna and the donor antenna.	<input type="checkbox"/>	Yes
c.	Active RF emitting equipment shall have built-in oscillation detection and control circuitry.	<input type="checkbox"/>	Yes
9	Signage at Fire Alarm Panel "This building is equipped with an Emergency Responder Radio Coverage System. Control equipment located in room _____", and signage on or adjacent to the door of the room containing the main system components stating: "Emergency Responder Radio Coverage System Equipment".	<input type="checkbox"/>	Yes
10	Donor antenna(s) are installed in a manner that meets applicable requirements in the International Building Code for weather protection of the building envelope, and are permanently affixed on the highest possible position on the building or where approved by the fire code official, with a sign stating "Movement or repositioning of the antenna is prohibited without approval from the fire code official".	<input type="checkbox"/>	Yes
<b>DISTRIBUTION SYSTEM AND COVERAGE</b>			
11	Perform in-building coverage test/grid test as required by 2018 Seattle Fire Code Section 510.5.3 using a calibrated spectrum analyzer: Signal strength remains stronger than (less negative than) -95 dBm for 95% of grids on each floor in non-critical areas (for a 20 grid square test, this means that at least 19 of the grids must pass for the floor to pass).	<input type="checkbox"/>	Yes

12	The list of critical areas to be provided coverage in this building is complete (list is stored with inventory information above).	<input type="checkbox"/> Yes
13	Critical areas are provided with 99% floor area radio coverage with coverage stronger than -95 dBm.	<input type="checkbox"/> Yes
14	Perform functional (talk-back) testing in each critical area using one radio in the building and one radio outside the building – radios function sufficiently for communications with a DAQ of 3 or higher?	<input type="checkbox"/> Yes
15	Perform functional (talk-back) testing between each critical area in the building to fire command center, or if no command center, fire alarm control panel – radios function sufficiently for communications with a DAQ of 3 or higher?	<input type="checkbox"/> Yes
16	Perform functional (talk-back) testing between a radio at the fire alarm control panel and a radio at each landing in each stairwell – radios function sufficiently for communications with a DAQ of 3 or higher?	<input type="checkbox"/> Yes
17	Spectrum analyzer or other suitable test equipment has been utilized and confirms that no spurious oscillations are being generated by the subject signal booster.	<input type="checkbox"/> Yes
<b>BATTERIES/SECONDARY POWER</b>		
18	Backup batteries and secondary power supply tested under load for one hour and meet requirements.	<input type="checkbox"/> Yes
<b>ALARM PANEL MONITORING</b>		
19	The fire alarm system is supervising the DAS.	<input type="checkbox"/> Yes
20	The fire alarm panel either (1) separately annunciates the following conditions, or (2) the fire alarm panel has a single DAS supervisory signal annunciating a DAS deficiency with an additional panel at the DAS in the enclosure displays status for all of the following conditions; and, the annunciation was tested and functioning properly: a. Donor antenna malfunction. b. Active RF emitting device failure. c. Low battery capacity indication when 70% of 12-hour operating capacity has been depleted. d. System component failure. e. Loss of normal AC power. f. Failure of battery charger.	<input type="checkbox"/> Yes <input type="checkbox"/> Yes <input type="checkbox"/> Yes <input type="checkbox"/> Yes <input type="checkbox"/> Yes <input type="checkbox"/> Yes
21	Communications link between the fire alarm system and the two-way radio communications enhancement system is monitored for integrity.	<input type="checkbox"/> Yes
22	A supervisory signal was received at Central Station Monitoring company.	<input type="checkbox"/> Yes
<b>FINAL CHECKS</b>		
23	If building includes a fire alarm system, inform alarm monitoring company that testing is complete.	<input type="checkbox"/> Yes
<b>SIGNATURES AND REPORTING</b>		
24	I will attach a white service label after this system is inspected by the Fire Department inspector.	<input type="checkbox"/> Yes
25	I will provide a copy of the acceptance test report to the responsible party after the system is inspected by the Fire Department inspector.	<input type="checkbox"/> Yes
26	I have submitted this report to the Fire Department through TCE or I will do so within 24 hours of the date of the Fire Department inspection.	<input type="checkbox"/> Yes

By accepting this statement I attest that I am properly qualified under the Seattle Fire Code and PSERN rules to perform this work. I further attest that the DAS has been properly installed and tested to meet the current Fire Code (FC) used by the department that has jurisdiction and NFPA Standards adopted by the FC for this system.

<input type="checkbox"/> I accept.	<input type="checkbox"/> I am authorized to submit this report for the certified technician who has accepted this statement.	(Initials of Employee)
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**SIGNATURE (OPTIONAL)**

Signature of Technician

Signature of Building Representative

**This Report Must Be Submitted Online Prior to Your Fire Department Inspection.**  
**You Must Also Have a Printed Copy Available for Your Inspector at the Job Site.**

Submit reports to <http://www.thecomplianceengine.com/>