

Project 25 Compliance Assessment Program  
 Summary Test Report  
 EF Johnson ATLAS UHF Repeater  
 STR-EFJ-14040402  
 April 4, 2014

Test Item Description	
<b>Manufacturer</b>	EF Johnson Technologies
<b>Manufacturer Contact</b>	John Oblak (507) 837-5116
<b>Product Name</b>	ATLAS UHF Repeater (380 MHz to 470 MHz)
<b>Installed Options</b>	Trunking Software
<b>Vocoder Identification</b>	Not Applicable – The repeater does not incorporate a vocoder

Test Description
P25-CAB-CAI_TEST_REQ – March 2010, Section 2.2.1.1 – Project 25 Phase 1 Common Air Interface Conventional Base Station/Repeater Performance
P25-CAB-CAI_TEST_REQ – March 2010, Section 2.2.1.2 – Project 25 Phase 1 Common Air Interface Trunked Base Station/Repeater Performance
P25-CAB-CAI_TEST_REQ – March 2010, Section 2.2.3.2 – Project 25 Phase 1 Common Air Interface Trunked Base station/Repeater Interoperability

Test Information	
<b>P25 CAP Laboratory Code</b>	P25CAP081010 (EF Johnson Technologies)
<b>Date(s) of Test</b>	January 28, 2013
<b>Date of Issue</b>	February 4, 2013

Test Information	
<b>P25 CAP Laboratory Code</b>	P25CAP081010 (EF Johnson Technologies)
<b>Date(s) of Test</b>	June 3, 2013 to June 6, 2013
<b>Date of Issue</b>	June 7, 2013

Test Information	
<b>P25 CAP Laboratory Code</b>	P25CAP081010 (EF Johnson Technologies)
<b>Date(s) of Test</b>	March 31, 2014
<b>Date of Issue</b>	April 1, 2014

Test Information	
<b>P25 CAP Laboratory Code</b>	P25CAP081010 (EF Johnson Technologies)
<b>Date(s) of Test</b>	March 28, 2014
<b>Date of Issue</b>	April 1, 2014

Project 25 Compliance Assessment Program  
Summary Test Report  
EF Johnson ATLAS UHF Repeater  
STR-EFJ-14040402  
April 2, 2014

Test Information	
<b>P25 CAP Laboratory Code</b>	P25CAP081010 (EF Johnson Technologies)
<b>Date(s) of Test</b>	April 3, 2014
<b>Date of Issue</b>	April 4, 2014

Informative References	
Date	Title
March 2010	P25-CAB-CAI_TEST_REQ-March 2010

Other Devices Tested with ATLAS UHF Repeater		
Manufacturer	Product Name, Definition, and Unique ID	Installed Options
EF Johnson	Viking VP600 Series Portable	Firmware 8.2.12
Midland	STP-105B Portable Subscriber	Firmware 1.03.4646
Harris	P5400 Portable Subscriber	Firmware R02A26; DSP V18.2

Project 25 Compliance Assessment Program  
 Summary Test Report  
 EF Johnson ATLAS UHF Repeater  
 STR-EFJ-14040402  
 April 2, 2014

<b>P25-CAB-CAI_TEST_REQ – March 2010, Section 2.2.1.1 – Project 25 Phase 1 Common Air Interface Conventional Base Station/Repeater Performance</b>		<b>DTR-P25CAP081010-13060701</b>	
<b>Receiver Tests</b>			
<b>Test Case</b>	<b>Description</b>	<b>Requirement</b>	<b>Results</b>
2.1.4	Reference Sensitivity	≤ -116 dBm (Class A)	P
2.1.5	Faded Reference Sensitivity	≤ -108 dBm (Class A)	P
2.1.7	Adjacent Channel Rejection	≥ 60 dB (Class A)	P
2.1.8	Co-Channel Rejection	≤ 9 dB	P
2.1.9	Spurious Response Rejection	≥ 90 dB (Class A)	P
2.1.10	Intermodulation Rejection	≥ 70 dB (Class B)	P
2.1.11	Signal Displacement Bandwidth	≥ 1000 Hz	P
2.1.17	Late Entry Unsquelch Delay		
	No Talk Group or Encryption	≤ 125 ms	N1
	Talk Group Only	≤ 370 ms	N1
	Encryption Only	≤ 370 ms	N1
	Both Talk Group and Encryption	≤ 460 ms	N1
2.1.18	Receiver Throughput Delay	≤ 125 ms	N1

Project 25 Compliance Assessment Program  
 Summary Test Report  
 EF Johnson ATLAS UHF Repeater  
 STR-EFJ-14040402  
 April 2, 2014

<b>P25-CAB-CAI_TEST_REQ – March 2010, Section 2.2.1.1 – Project 25 Phase 1 Common Air Interface Conventional Base Station/Repeater Performance</b>		<b>DTR-P25CAP081010-13060701</b>	
<b>Transmitter Tests</b>			
<b>Test Case</b>	<b>Description</b>	<b>Requirement</b>	<b>Results</b>
2.2.8	Unwanted Emissions: Adjacent Channel Power Ratio	$\geq 67$ dB	P
2.2.14	Transmitter Throughput Delay	$\leq 125$ ms	N2
2.2.15	Frequency Deviation for C4FM High Level Signal Deviation	$2544 \text{ Hz} < f_{\text{dev}} \leq 3111 \text{ Hz}$	P
	Low Level Signal Deviation	$848 \text{ Hz} < f_{\text{dev}} \leq 1037 \text{ Hz}$	P
2.2.16	Modulation Fidelity	$\leq 5\%$ (Class A)	P
2.2.18	Transient Frequency Behavior Time Interval $t_1 = 10$ ms	$ \Delta f  \leq 12.5$ kHz	P
	Time Interval $t_2 = 25$ ms	$ \Delta f  \leq 6.25$ kHz	P
	Time Interval $t_3 = 10$ ms	$ \Delta f  \leq 12.5$ kHz	P

Project 25 Compliance Assessment Program  
 Summary Test Report  
 EF Johnson ATLAS UHF Repeater  
 STR-EFJ-14040402  
 April 2, 2014

<b>P25-CAB-CAI_TEST_REQ – March 2010, Section 2.2.1.2 – Project 25 Phase 1 Common Air Interface Trunked Base Station/Repeater Performance</b>		<b>DTR-P25CAP081010-13060701</b>	
<b>Receiver Tests</b>			
<b>Test Case</b>	<b>Description</b>	<b>Requirement</b>	<b>Results</b>
2.1.4	Reference Sensitivity	$\leq -116$ dBm (Class A)	P
2.1.5	Faded Reference Sensitivity	$\leq -108$ dBm (Class A)	P
2.1.7	Adjacent Channel Rejection	$\geq 60$ dB (Class A)	P
2.1.8	Co-Channel Rejection	$\leq 9$ dB	P
2.1.9	Spurious Response Rejection	$\geq 90$ dB (Class A)	P
2.1.10	Intermodulation Rejection	$\geq 70$ dB (Class B)	P
2.1.11	Signal Displacement Bandwidth	$\geq 1000$ Hz	P

Project 25 Compliance Assessment Program  
 Summary Test Report  
 EF Johnson ATLAS UHF Repeater  
 STR-EFJ-14040402  
 April 2, 2014

<b>P25-CAB-CAI_TEST_REQ – March 2010, Section 2.2.1.2 – Project 25 Phase 1 Common Air Interface Trunked Base Station/Repeater Performance</b>		<b>DTR-P25CAP081010-13060701</b>	
<b>Transmitter Tests</b>			
<b>Test Case</b>	<b>Description</b>	<b>Requirement</b>	<b>Results</b>
2.2.8	Unwanted Emissions: Adjacent Channel Power Ratio	$\geq 67$ dB	P
2.2.14	Transmitter Throughput Delay	$\leq 125$ ms	N2
2.2.15	Frequency Deviation for C4FM High Level Signal Deviation	$2544 \text{ Hz} < f_{\text{dev}} \leq 3111 \text{ Hz}$	P
	Low Level Signal Deviation	$848 \text{ Hz} < f_{\text{dev}} \leq 1037 \text{ Hz}$	P
2.2.16	Modulation Fidelity	$\leq 5\%$ (Class A)	P
2.2.18	Transient Frequency Behavior Time Interval $t_1 = 10$ ms	$ \Delta f  \leq 12.5$ kHz	P
	Time Interval $t_2 = 25$ ms	$ \Delta f  \leq 6.25$ kHz	P
	Time Interval $t_3 = 10$ ms	$ \Delta f  \leq 12.5$ kHz	P

Project 25 Compliance Assessment Program  
 Summary Test Report  
 EF Johnson ATLAS UHF Repeater  
 STR-EFJ-14040402  
 April 2, 2014

<b>P25-CAB-CAI_TEST_REQ – March 2010, Section 2.2.1.2 – Project 25 Phase 1 Common Air Interface Trunked Base Station/Repeater Performance</b>		<b>DTR-P25CAP081010-14040401</b>	
<b>Trunking Infrastructure Tests</b>			
<b>Test Case</b>	<b>Description</b>	<b>Requirement</b>	<b>Results</b>
2.3.3	Trunking Voice Access Time	560 ms (Manufacturer Specified)	P
2.3.4	Time to Grant		
	Non-Simulcast 37.5 ms ISP	Single TSBK < 337.5 ms	P
		Double TSBK < 354.0 ms	N3
		Triple TSBK < 366.5 ms	N3
	Non-Simulcast 45 ms ISP	Single TSBK < 345.0 ms	P
		Double TSBK < 361.5 ms	N3
		Triple TSBK < 374.0 ms	N3
	Simulcast 37.5 ms ISP	Single TSBK < 487.5 ms	N3
		Double TSBK < 504.0 ms	N3
		Triple TSBK < 516.5 ms	N3
	Simulcast 45 ms ISP	Single TSBK < 495.0 ms	N3
		Double TSBK < 511.5 ms	N3
		Triple TSBK < 524.0 ms	N3

Project 25 Compliance Assessment Program  
 Summary Test Report  
 EF Johnson ATLAS UHF Repeater  
 STR-EFJ-14040402  
 April 2, 2014

<b>P25-CAB-CAI_TEST_REQ – March 2010, Section 2.2.3.2 – Project 25 Phase 1 Common Air Interface Trunked Base Station/Repeater Interoperability</b>		DTR-P25CAP081010-14040101	DTR-P25CAP081010-14040102	DTR-P25CAP081010-13020401
<b>EF Johnson ATLAS Trunked Repeater</b>		Midland STP-105B	Harris P5400	EF Johnson Viking VP600
<b>Test Case</b>	<b>Description</b>			
<b>2.2.1</b>	<b>Full Registration</b>			
<b>2.2.1.4.1</b>	Test Case 1 - Valid Registration			
	Home Operation	P	P	P
	Inter-System Operation	N3	N3	N3
	Inter-WACN Operation	N3	N3	N3
<b>2.2.1.4.2</b>	Test Case 2 – Denied or Refused Registration			
	Home Operation	P	P	P
	Inter-System Operation	N3	N3	N3
	Inter-WACN Operation	N3	N3	N3
<b>2.2.1.4.3</b>	Test Case 3 - Unverified Registration			
	Home Operation	P	P	P
	Inter-System Operation	N3	N3	N3
	Inter-WACN Operation	N3	N3	N3
<b>2.2.2</b>	<b>Group Voice Call</b>			
<b>2.2.2.4.1</b>	Test Case 1 – Group Call Granted			
	Home Operation	P	P	P
	Inter-System Operation	N3	N3	N3
	Inter-WACN Operation	N3	N3	N3
<b>2.2.2.4.2</b>	Test Case 2 – Group Call Denied			
	Home Operation	P	P	P
	Inter-System Operation	N3	N3	N3
	Inter-WACN Operation	N3	N3	N3
<b>2.2.2.4.3</b>	Test Case 3 – Group Call Request Queued			
	Home Operation	P	P	P
	Inter-System Operation	N3	N3	N3
	Inter-WACN Operation	N3	N3	N3



Project 25 Compliance Assessment Program  
 Summary Test Report  
 EF Johnson ATLAS UHF Repeater  
 STR-EFJ-14040402  
 April 2, 2014

<b>P25-CAB-CAI_TEST_REQ – March 2010, Section 2.2.3.2 – Project 25 Phase 1 Common Air Interface Trunked Base Station/Repeater Interoperability</b>		DTR-P25CAP081010-14040101	DTR-P25CAP081010-14040102	DTR-P25CAP081010-13020401
<b>EF Johnson ATLAS Trunked Repeater</b>		Midland STP-105B	Harris P5400	EF Johnson Viking VP600
<b>Test Case</b>	<b>Description</b>			
<b>2.2.3</b>	<b>Unit-to-Unit Voice Call</b>			
<b>2.2.3.4.1</b>	Test Case 1 – Unit-To-Unit Call With Target Availability Check			
	Home Operation	P	P	P
	Inter-System Operation	N3	N3	N3
	Inter-WACN Operation	N3	N3	N3
<b>2.2.3.4.2</b>	Test Case 2 – Unit-To-Unit Call Target Availability Check Denied By Target			
	Home Operation	P	P	P
	Inter-System Operation	N3	N3	N3
	Inter-WACN Operation	N3	N3	N3
<b>2.2.3.4.3</b>	Test Case 3 – Unit-To-Unit Call Queued With Target Availability Check – traffic channel assignment after target availability check			
	Home Operation	P	P	P
	Inter-System Operation	N3	N3	N3
	Inter-WACN Operation	N3	N3	N3
<b>2.2.3.4.4</b>	Test Case 4 – Unit-To-Unit Call Queued With Target Availability Check – traffic channel assignment before target availability check			
	Home Operation	N/A 1	N/A 1	N/A 1
	Inter-System Operation	N3	N3	N3
	Inter-WACN Operation	N3	N3	N3

Project 25 Compliance Assessment Program  
 Summary Test Report  
 EF Johnson ATLAS UHF Repeater  
 STR-EFJ-14040402  
 April 2, 2014

<b>P25-CAB-CAI_TEST_REQ – March 2010, Section 2.2.3.2 – Project 25 Phase 1 Common Air Interface Trunked Base Station/Repeater Interoperability</b>		DTR-P25CAP081010-14040101	DTR-P25CAP081010-14040102	DTR-P25CAP081010-13020401
<b>EF Johnson ATLAS Trunked Repeater</b>		Midland STP-105B	Harris P5400	EF Johnson Viking VP600
<b>Test Case</b>	<b>Description</b>			
<b>2.2.3</b>	<b>Unit-to-Unit Voice Call</b>			
<b>2.2.3.4.5</b>	Test Case 5 – Unit-To-Unit Call Without Target Availability Check			
	Home Operation	N3	N3	N3
	Inter-System Operation	N3	N3	N3
	Inter-WACN Operation	N3	N3	N3
<b>2.2.3.4.6</b>	Test Case 7 – Unit-To-Unit Call Queued Without Target Availability Check			
	Home Operation	N3	N3	N3
	Inter-System Operation	N3	N3	N3
	Inter-WACN Operation	N3	N3	N3
<b>2.2.3.4.7</b>	Test Case 8 – Unit-To-Unit Call Denied			
	Home Operation	P	P	P
	Inter-System Operation	N3	N3	N4
	Inter-WACN Operation	N3	N3	N4

Project 25 Compliance Assessment Program  
 Summary Test Report  
 EF Johnson ATLAS UHF Repeater  
 STR-EFJ-14040402  
 April 2, 2014

<b>P25-CAB-CAI_TEST_REQ – March 2010, Section 2.2.3.2 – Project 25 Phase 1 Common Air Interface Trunked Base Station/Repeater Interoperability</b>		DTR-P25CAP081010-14040101	DTR-P25CAP081010-14040102	DTR-P25CAP081010-13020401
<b>EF Johnson ATLAS Trunked Repeater</b>		Midland STP-105B	Harris P5400	EF Johnson Viking VP600
<b>Test Case</b>	<b>Description</b>			
<b>2.2.4</b>	<b>Broadcast Voice Call</b>			
<b>2.2.4.4.1</b>	Test Case 1 – Broadcast Voice Call			
	Home Operation	P	P	P
	Inter-System Operation	N3	N3	N3
	Inter-WACN Operation	N3	N3	N3
<b>2.2.5</b>	<b>Affiliation</b>			
<b>2.2.5.4.1</b>	Test Case 1 - Radio Permitted To Affiliate With New Group			
	Home Operation	P	P	P
	Inter-System Operation	N3	N3	N3
	Inter-WACN Operation	N3	N3	N3
<b>2.2.5.4.2</b>	Test Case 2 - Radio Denied Affiliation To New Group			
	Home Operation	P	P	P
	Inter-System Operation	N3	N3	N3
	Inter-WACN Operation	N3	N3	N3
<b>2.2.6</b>	<b>Announcement Group Call</b>			
<b>2.2.6.4.1</b>	Test Case 1 - Collection Of Talk Groups Receive Call			
	Home Operation	P	P	P
	Inter-System Operation	N3	N3	N3
	Inter-WACN Operation	N3	N3	N3
<b>2.2.7</b>	<b>Emergency Alarm</b>			
<b>2.2.7.4.1</b>	Test Case 1 - Emergency Alarm			
	Home Operation	P	P	P
	Inter-System Operation	N3	N3	N3
	Inter-WACN Operation	N3	N3	N3

Project 25 Compliance Assessment Program  
 Summary Test Report  
 EF Johnson ATLAS UHF Repeater  
 STR-EFJ-14040402  
 April 2, 2014

<b>P25-CAB-CAI_TEST_REQ – March 2010, Section 2.2.3.2 – Project 25 Phase 1 Common Air Interface Trunked Base Station/Repeater Interoperability</b>		DTR-P25CAP081010-14040101	DTR-P25CAP081010-14040102	DTR-P25CAP081010-13020401
<b>EF Johnson ATLAS Trunked Repeater</b>		Midland STP-105B	Harris P5400	EF Johnson Viking VP600
<b>Test Case</b>	<b>Description</b>			
<b>2.2.8</b>	<b>Emergency Group Call</b>			
<b>2.2.8.4.1</b>	Test Case 1 - Emergency Call			
	Home Operation	P	P	P
	Inter-System Operation	N3	N3	N3
	Inter-WACN Operation	N3	N3	N3
<b>2.2.10</b>	<b>Encryption</b>			
<b>2.2.10.4.1</b>	Test Case 1 - Call Privacy For Encrypted Call			
	Home Operation	P	P	P
	Inter-System Operation	N3	N3	N3
	Inter-WACN Operation	N3	N3	N3
<b>2.2.11</b>	<b>Intra-Location Registration Area Roaming</b>			
<b>2.2.11.4.1</b>	Test Case 1 – Idle Radio			
	Home Operation	P	P	P
	Inter-System Operation	N3	N3	N3
	Inter-WACN Operation	N3	N3	N3

Project 25 Compliance Assessment Program  
 Summary Test Report  
 EF Johnson ATLAS UHF Repeater  
 STR-EFJ-14040402  
 April 2, 2014

<b>Model Class Definition</b>	<b>Applied to P25-CAB-CAI_Test_Req March 2010, 2.2.3.2</b>	
<b>Model Class Name</b>	<b>Product Name, Definition, and Unique ID</b>	<b>Installed Options</b>
ATLAS UHF Repeater	ATLAS Trunked Repeater	<b>Firmware:</b> TSNI 1.0.5-1
		<b>Firmware:</b> TSNI 1.2.0-14

<b>Test Case Result Definitions</b>	
<b>No Test Performed</b>	---
<b>Test Does Not Apply to the Test Object</b>	N/A
<b>Test Object Meets Requirements</b>	P (Pass)
<b>Test Object Does Not Meet Requirements</b>	F (Fail)
<b>Test Object is Not Conclusive</b>	I (Inconclusive)

<b>Comments</b>
N/A 1: Test cases 2.2.3.4.4 is not applicable for this base station/repeater; see results of test 2.2.3.4.3
N1: The receiver does not incorporate a vocoder.
N2: The transmitter does not incorporate a vocoder.
N3: The EF Johnson ATLAS TSNI infrastructure does not support this feature.

Project 25 Compliance Assessment Program  
Summary Test Report  
EF Johnson ATLAS UHF Repeater  
STR-EFJ-14040402  
April 2, 2014

The information contained herein has been provided by the manufacturer of the product with permission to make the information publicly available. The Department of Homeland Security (DHS) is making this information available as a public service; however, DHS IS PROVIDING THE INFORMATION "AS IS". DHS MAKES NO EXPRESS OR IMPLIED WARRANTIES AND SPECIFICALLY, DHS MAKES NO WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE, REGARDING THE ACCURACY OR USE OF THIS INFORMATION. Reference to any specific commercial products, processes, or services by trade name, trademark, manufacturer, or otherwise does not constitute an endorsement by or recommendation from DHS.

**OMB NO:** 1640-0015

**EXPIRATION DATE:** 07/31/2015

**Burden Statement**

An agency may not consider or sponsor information collection and a person is not required to respond to this information collection unless it displays a current valid Office of Management and Budget control number and expiration date. The control number for this collection is 1640-0015 and this form will expire on 07/31/2015. The estimated average time to complete this form is 60 minutes per respondent. If you have any comments regarding the burden estimate you can write to Department of Homeland Security, Science and Technology Directorate, Washington, DC 20528.

DHS FORM 10056 – June 2009