

Project 25 Compliance Assessment Program
 Summary Test Report
 EF Johnson ATLAS 700 MHz Repeater
 STR-EFJ-14040403
 April 4, 2014

Test Item Description	
Manufacturer	EF Johnson Technologies
Manufacturer Contact	John Oblak (507) 837-5116
Product Name	ATLAS 700 MHz Repeater
Installed Options	Trunking Software
Vocoder Identification	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	
P25 CAP Laboratory Code	P25CAP081010 (EF Johnson Technologies)
Date(s) of Test	January 28, 2013
Date of Issue	February 4, 2013

Test Information	
P25 CAP Laboratory Code	P25CAP081010 (EF Johnson Technologies)
Date(s) of Test	July 2, 2013 to July 19, 2013
Date of Issue	July 19, 2013

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

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

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

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P25-CAB-CAI_TEST_REQ – March 2010, Section 2.2.1.1 – Project 25 Phase 1 Common Air Interface Conventional Base Station/Repeater Performance		DTR-P25CAP081010-13071901	
Receiver Tests			
Test Case	Description	Requirement	Results
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

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P25-CAB-CAI_TEST_REQ – March 2010, Section 2.2.1.1 – Project 25 Phase 1 Common Air Interface Conventional Base Station/Repeater Performance		DTR-P25CAP081010-13071901	
Transmitter Tests			
Test Case	Description	Requirement	Results
2.2.8	Unwanted Emissions: Adjacent Channel Power Ratio Offset From Center Frequency		
	9.375 kHz	≥ 40 dB	P
	15.625, 21.875, 37.5 kHz	≥ 60 dB	P
	62.5, 87.5, 150, 250, 350 kHz	≥ 65 dB	P
	>400 kHz to 12 MHz	≥ 80 dB	P
	12 MHz to the Paired RX Band In the Paired RX Band	≥ 80 dB ≥ 100 dB	P P
2.2.14	Transmitter Throughput Delay	≤ 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 $t_1 = 20$ ms	$ \Delta f \leq 12.5$ kHz	P
	Time Interval $t_2 = 50$ ms	$ \Delta f \leq 6.25$ kHz	P
	Time Interval $t_3 = 10$ ms	$ \Delta f \leq 12.5$ kHz	P

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P25-CAB-CAI_TEST_REQ – March 2010, Section 2.2.1.2 – Project 25 Phase 1 Common Air Interface Trunked Base Station/Repeater Performance		DTR-P25CAP081010-13071901	
Receiver Tests			
Test Case	Description	Requirement	Results
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

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P25-CAB-CAI_TEST_REQ – March 2010, Section 2.2.1.2 – Project 25 Phase 1 Common Air Interface Trunked Base Station/Repeater Performance		DTR-P25CAP081010-13071901	
Transmitter Tests			
Test Case	Description	Requirement	Results
2.2.8	Unwanted Emissions: Adjacent Channel Power Ratio Offset From Center Frequency		
	9.375 kHz	≥ 40 dB	P
	15.625, 21.875, 37.5 kHz	≥ 60 dB	P
	62.5, 87.5, 150, 250, 350 kHz	≥ 65 dB	P
	>400 kHz to 12 MHz	≥ 80 dB	P
	12 MHz to the Paired RX Band In the Paired RX Band	≥ 80 dB ≥ 100 dB	P P
2.2.14	Transmitter Throughput Delay	≤ 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 $t_1 = 20$ ms	$ \Delta f \leq 12.5$ kHz	P
	Time Interval $t_2 = 50$ ms	$ \Delta f \leq 6.25$ kHz	P
	Time Interval $t_3 = 10$ ms	$ \Delta f \leq 12.5$ kHz	P

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P25-CAB-CAI_TEST_REQ – March 2010, Section 2.2.1.2 – Project 25 Phase 1 Common Air Interface Trunked Base Station/Repeater Performance		DTR-P25CAP081010-14040401	
Trunking Infrastructure Tests			
Test Case	Description	Requirement	Results
2.3.3	Trunking Voice Access Time	500 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

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

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EF Johnson ATLAS Trunked Repeater		Midland STP-105B	Harris P5400	EF Johnson Viking VP600
Test Case	Description			
2.2.3	Unit-to-Unit Voice Call			
2.2.3.4.1	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
2.2.3.4.2	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
2.2.3.4.3	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
2.2.3.4.4	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

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EF Johnson ATLAS Trunked Repeater		Midland STP-105B	Harris P5400	EF Johnson Viking VP600
Test Case	Description			
2.2.3	Unit-to-Unit Voice Call			
2.2.3.4.5	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
2.2.3.4.6	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
2.2.3.4.7	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

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EF Johnson ATLAS Trunked Repeater		Midland STP-105B	Harris P5400	EF Johnson Viking VP600
Test Case	Description			
2.2.4	Broadcast Voice Call			
2.2.4.4.1	Test Case 1 – Broadcast Voice Call			
	Home Operation	P	P	P
	Inter-System Operation	N3	N3	N3
	Inter-WACN Operation	N3	N3	N3
2.2.5	Affiliation			
2.2.5.4.1	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
2.2.5.4.2	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
2.2.6	Announcement Group Call			
2.2.6.4.1	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
2.2.7	Emergency Alarm			
2.2.7.4.1	Test Case 1 - Emergency Alarm			
	Home Operation	P	P	P
	Inter-System Operation	N3	N3	N3
	Inter-WACN Operation	N3	N3	N3

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EF Johnson ATLAS Trunked Repeater		Midland STP-105B	Harris P5400	EF Johnson Viking VP600
Test Case	Description			
2.2.8	Emergency Group Call			
2.2.8.4.1	Test Case 1 - Emergency Call			
	Home Operation	P	P	P
	Inter-System Operation	N3	N3	N3
	Inter-WACN Operation	N3	N3	N3
2.2.10	Encryption			
2.2.10.4.1	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
2.2.11	Intra-Location Registration Area Roaming			
2.2.11.4.1	Test Case 1 – Idle Radio			
	Home Operation	P	P	P
	Inter-System Operation	N3	N3	N3
	Inter-WACN Operation	N3	N3	N3

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

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

Comments
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.

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EXPIRATION DATE: 07/31/2015

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