

label	Requirement Category	Requirement	Source of requirement	Acceptance criteria (qualitative description)	Metrics	Acceptable metrics	Unacceptable failure modes	Source of metrics? (Default is Vx ERD)	Followup if failures are seen?	Destructive?	Subsystems to test	Priority to test	Order of Testing, roughly	Estimated time to test (min)
1	Environmental resistance	System resists damage from storage in cyclic hot environment	VVSG 2.7-D, 2.7-E, 2.7-F, 3.1.5-G, TA2.7-F 1 through 4	Resists damage from hot storage test. Functions normally after hot storage test.	Run system in hot storage test, in climate chamber from an external vendor. Follow standard procedures described in MIL-STD-810H 501.7 Procedure I (p.94). After the test, inspect the unit. 1. Were visual failures and damage unable to be found? If so, record where and when, and under what vibration conditions. 2. After storage and reacclimating to room temperature, operate the unit for a basic check of normal function. Does it retain normal function? Test procedure key details (but consult MIL-STD-810H for full details): - Cycling 86-140 deg F - Cycling 25-55% RH - 86 deg F is paired with 25%RH; 140 deg F paired with 55%RH - Cycle over a 24-hour period throughout testing, changing temperature and humidity set points every 12 hours. - Apply cycles for 7 days minimum. - When done, bring back down to regular temperature before testing normal function. Physical configuration for test samples and chamber: - The MCM, UPS, and Ballot Box should be tested in typical storage configuration, with the MCM closed and upright, the UPS upright, and the Ballot Box collapsed. - The MCM, UPS, and Ballot Box can be tested in separate chambers or test runs, if logistically easier.	1. yes (no damage) 2. yes (normal function)	1. no 2. no	MIL-STD-810H, 501.7 Procedure 1 (p.94)	Discuss importance of cosmetic damage. Consult Head of Compliance/Certification on if it needs correction. Functional damage and changes require design mitigations.	possibly	MCM, BB, UPS	high	4	11520
2	Environmental resistance	System resists damage from storage in cyclic hot environment	VVSG 2.7-D, 2.7-E, 2.7-F, 3.1.5-G, TA2.7-F 1 through 4	Resists damage from lo-fi hot storage test. Functions normally after lo-fi hot storage test.	Similar test as #1, except done internally using low-temp oven system. Only possible to "aim" for the described metrics in the MIL spec. Record all differences from the spec, in excitation signals or other procedures, due to equipment or site limitations. Size constraints may limit testing on anything larger than the MCM.	1. yes (no damage) 2. yes (normal function)	1. no 2. no	MIL-STD-810H, 501.7 Procedure 1 (p.94)	Discuss importance of cosmetic damage. Consult Head of Compliance/Certification on if it needs correction. Functional damage and changes require design mitigations.	possibly	MCM	high	2	11520
3 (OPTIONAL / ADDITIONAL)	Environmental resistance	System resists damage from storage in the sun	n/a	Resists damage from storage in the sun. Functions normally after storage in the sun.	Store closed MCM in outdoor environment exposed to the sun in the summer, for 7 days (similar to test #1). Compare to other hot storage test results to see if similar data is obtained.	1. yes (no damage) 2. yes (normal function)	1. no 2. no	MIL-STD-810H, 501.7 Procedure 1 (p.94)	Discuss importance of cosmetic damage. Consult Head of Compliance/Certification on if it needs correction. Functional damage and changes require design mitigations.	possibly	MCM	low	n/a	11520
4	Environmental resistance	System resists damage from storage in cold environment	VVSG 2.7-D, 2.7-E, 2.7-F, 3.1.3-G, TA2.7-F 1 through 4	Resists damage from cold storage test. Functions normally after cold storage test.	Run system in cold storage test, in climate chamber from an external vendor. Follow standard procedures described in MIL-STD-810H 502.7 Procedure I (p.113). After the test, inspect the unit. 1. Were visual failures and damage unable to be found? If so, record where and when, and under what vibration conditions. 2. After storage and reacclimating to room temperature, operate the unit for a basic check of normal function. Does it retain normal function? Test procedure key details (but consult MIL-STD-810H for full details): - Cool to -5 degrees F - Apply humidity of 25-55%RH, according to the best effort possible with available equipment; cycle humidity over a 24-hour period throughout testing, changing every 12 hours. - Apply cold 72 hrs past temperature stabilization. - When done, bring back up to regular temperature before testing normal function. Physical configuration for test samples and chamber: - The MCM, UPS, and Ballot Box should be tested in typical storage configuration, with the MCM closed and upright, the UPS upright, and the Ballot Box collapsed. - The MCM, UPS, and Ballot Box can be tested in separate chambers or test runs, if logistically easier.	1. yes (no damage) 2. yes (normal function)	1. no 2. no	MIL-STD-810H, 502.7 Procedure 1 (p.113)	Discuss importance of cosmetic damage. Consult Head of Compliance/Certification on if it needs correction. Functional damage and changes require design mitigations.	possibly	MCM, BB, UPS	high	5	4800
5	Environmental resistance	System resists damage from storage in cold environment	VVSG 2.7-D, 2.7-E, 2.7-F, 3.1.3-G, TA2.7-F 1 through 4	Resists damage from lo-fi cold storage test. Functions normally after lo-fi cold storage test.	Similar test as #4, except done internally using consumer-grade chest freezer. Only possible to "aim" for the described metrics in the MIL spec. Record all differences from the spec, in excitation signals or other procedures, due to equipment or site limitations. Size constraints may limit testing on anything larger than the MCM.	1. yes (no damage) 2. yes (normal function)	1. no 2. no	MIL-STD-810H, 502.7 Procedure 1 (p.113)	same as above	possibly	MCM	high	1	4800

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6	Environmental resistance	System functions in extreme operational conditions for a long time	1.2-C, 1.2-D, 1.2-G, 2.7-A, 2.7-B, 2.7-C, 1.1.6-F, TA2.7C 1 through 9, TA2.7-B 1	Low misfeed rate for scanning. Functions normally during operational extremes.	Consult external test vendor to conduct test. Key procedure details for higher-fidelity test: - 104 consecutive hours of continuous testing time (when system is powered on). If failures are observed before the end of the test, consult VotingWorks, and potentially cut the test short to avoid further failures. - Run the paper feeder for 15 minutes every hour at max rate (otherwise on standby) - Cycling 50-95 deg F, for 72 hrs - Cycling 25-55% RH, for 72 hrs - 24-hr cycles, where every 12 hrs temp & RH must shift - 50 deg F is paired with 25%RH; 95 deg F paired with 55%RH - Temp and humidity in normal conditions (room temp, ~50%RH) for 32 hrs total - Reports on system every 4 hours of continuous operation - Measure the misfeed rate when scanning ballots into the system. Measure the number of jams or improper ballot rejections seen, out of all the ballots fed in this long test. This target misfeed rate is 1/500 (0.2%) or less. A greater misfeed rate is another type of failure. Estimated time: - Either 5 days continuous work (104 hours continuous test time + additional work) - OR 2 weeks discontinuous work (assuming 8-hour work days)	1. yes (no damage) 2. yes (normal function)	1. no (fatigue, loose parts) 2. no (alters normal scanning, printing, or other noticeable functions)	MIL-STD-810H, 502.7 Procedure 2 (p.94)	Discuss importance of cosmetic damage. Consult Head of Compliance/Certification on if it needs correction. Functional damage and changes require design mitigations.	possibly	MCM, BB, UPS	high	6	6600
7	Environmental resistance	System functions in extreme operational conditions for a long time	1.2-C, 1.2-D, 1.2-G, 2.7-A, 2.7-B, 2.7-C, 1.1.6-F, TA2.7C 1 through 9, TA2.7-B 1	Low misfeed rate for scanning. Functions normally during operational extremes in lo-fi test.	Similar test as #6, except done internally using tent, heater, humidifier, and dehumidifier. Only possible to "aim" for the described metrics in the MIL spec. Record all differences from the spec, in excitation signals or other procedures, due to equipment or site limitations.	1. yes (no damage) 2. yes (normal function)	1. no (fatigue, loose parts) 2. no (alters normal scanning, printing, or other noticeable functions)	MIL-STD-810H, 502.7 Procedure 2 (p.94)	same as above	possibly	MCM, BB, UPS	high	3	6600

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