MAINTENANCE TECHNICAL SUPPORT CENTER
HEADQUARTERS MAINTENANCE OPERATIONS
UNITED STATES POSTAL SERVICE

Maintenance Management Order

SUBJECT: Preventive and Operational Maintenance Guidelines for Automated Flat Sorter Machine 100 (AFSM100) with and without Automatic Tray Handling System (ATHS) Using eCBM

DATE: September 23, 2021

TO: All AFSM100 Sites

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This Maintenance Management Order (MMO) **supersedes MMO-095-12** and provides Preventive and Operational Maintenance Guidelines for Automated Flat Sorter Machine 100 (AFSM100) with and without Automatic Tray Handling System (ATHS). This bulletin applies to Acronym AFSM100, Class Codes AB and AC.

The workhours indicated in the workload estimate (Attachment 1) are based on a 16-hour operations window and reflect the maximum annual workhours required to maintain each system. Actual workhour requirements and the frequency of tasks are dependent on run time and pieces processed. Therefore, PM workhour requirements will vary day-to-day based on site-specific machine utilization. Management may modify task frequencies to address local conditions.

The minimum maintenance skill level required to perform each task is included in the Minimum Skill Level column of each checklist. This does not preclude higher level employees from performing any of this work.

Preventive Maintenance (PM) guidelines provide maintenance employees with the recommended task based maintenance activities. The Electronic Conditioned Based Maintenance (eCBM) is an abbreviated task list that represents a portion of the PM checklist. The complete master PM checklist must be accessible to all maintenance employees when performing PM and eCBM task based maintenance activities.

WARNING

Various products requiring Safety Data Sheets (SDS) may be utilized during the performance of the procedures in this bulletin. Ensure the current SDS for each product used is on file and available to all employees. When reordering such a product, it is suggested that current SDS be requested. Refer to SDS for appropriate personal protective equipment.

WARNING

The use of compressed or blown air is prohibited. An alternative cleaning method such as a HEPA filtered vacuum cleaner, a damp rag, lint-free cloth, or brush must be used in place of compressed or blown air.

WARNING

Steps contained in this bulletin may require the use of Electrical Work Plan (EWP) Personal Protective Equipment (PPE). Refer to the current EWP MMO for appropriate EWP PPE and barricade requirements.

For questions or comments concerning this bulletin contact the MTSC HelpDesk, either online at **MTSC>HELPDESK>Create/Update Tickets** or call (800) 366-4123.

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Attachments
1. Summary of Workload Estimate For AFSM100 System
2. Master Checklist 03-AFSM100-AB-001-M – AFSM100 (Non-ATHS) Preventive Maintenance (PM)
3. Master Checklist 03-AFSM100-AC-002-M – AFSM100 (ATHS) Preventive Maintenance (PM)
4. Master Checklist 09-AFSM100-AB-001-M – AFSM100 (Non-ATHS) Operational Maintenance (OM)
5. Master Checklist 09-AFSM100-AC-002-M – AFSM100 (ATHS) Operational Maintenance (OM)
6. Master Checklist 09-AFSM100-**-003-M – AFSM100 (Non-ATHS and ATHS) Operational Maintenance (OM)

ATTACHMENT 1

SUMMARY WORKLOAD ESTIMATE

FOR AFSM100 (NON-ATHS AND ATHS)

SUMMARY WORK LOAD ESTIMATES FOR AFSM100_AB (non-ATHS)

Operation Days	Routine Servicing per Machine (Hrs/Yr)	Repair Time per Machine (Hrs/yr) *	Routine Servicing + Repair Time (Hrs/Yr)	Non-Productive Time per Machine (Hrs/yr) **	Total Servicing per Machine (Hrs/Yr)	Operational Maintenance + Total Servicing	
						1 Tour Hrs/Yr OpM x 1	2 Tours Hrs/Yr OpM x 2
5 Days	1151.52	345.46	1496.98	149.70	1646.67	1,880.67	2,006.34
6 Days	1330.05	399.02	1729.07	172.91	1901.97	2,182.77	2,333.57
7 Days	1508.58	452.57	1961.15	196.12	2157.27	2,484.87	2,660.80
*	**Repair maintenance estimates based on 30% of preventive maintenance.**						
**	**Based on 10% of total PM and repair.**						

	Operational Maintenance non-ATHS		
	One Tour	Two Tours	Three Tours
5 Days	234.00	359.67	N/A
6 Days	280.80	431.60	N/A
7 Days	327.60	503.53	N/A

NOTES:
∗Repair estimates based on 30% of servicing.
∗∗Based on 10% of total servicing and repair.

SUMMARY WORK LOAD ESTIMATES FOR AFSM100_AC (ATHS)

Operation Days	Routine Servicing per Machine (Hrs/Yr)	Repair Time per Machine (Hrs/yr) *	Routine Servicing + Repair Time (Hrs/Yr)	Non-Productive Time per Machine (Hrs/yr) **	Total Servicing per Machine (Hrs/Yr)	Operational Maintenance + Total Servicing	
						1 Tour Hrs/Yr OpM x 1	2 Tours Hrs/Yr OpM x 2
5 Days	1362.33	408.70	1771.03	177.10	1948.13	2,182.13	2,307.80
6 Days	1579.00	473.70	2052.70	205.27	2257.97	2,538.77	2,689.57
7 Days	1795.67	538.70	2334.37	233.44	2567.81	2,895.41	3,071.34
*	**Repair maintenance estimates based on 30% of preventive maintenance.**						
**	**Based on 10% of total PM and repair.**						

	Operational Maintenance ATHS		
	One Tour	Two Tours	Three Tours
5 Days	234.00	359.67	N/A
6 Days	280.80	431.60	N/A
7 Days	327.60	503.53	N/A

NOTES:
∗Repair estimates based on 30% of servicing.
∗∗Based on 10% of total servicing and repair.

ATTACHMENT 2

AFSM100 (NON-ATHS) MASTER CHECKLIST

03-AFSM100-AB-001-M

PREVENTIVE MAINTENANCE (PM)

Time Total: (779) minutes

U.S. Postal Service Maintenance Checklist	IDENTIFICATION															
	WORK CODE		EQUIPMENT ACRONYM								CLASS CODE		NUMBER			TYPE
	0	3	A	F	S	M	1	0	0		A	B	0	0	1	M
Equipment Nomenclature Automated Flat Sorting Machine 100	Equipment Model AFSM100 (Non-ATHS)										Bulletin Filename mm20138				Occurrence eCBM	

Part or Component	Item No	Task Statement and Instruction (Comply with all current safety precautions)	Est. Time Req (min)	Min. Skill Lev	Thresholds		
					Run Hours	Pieces Fed (000)	Freq.
SAFETY STATEMENT	1.**	**COMPLY WITH ALL SAFETY PRECAUTIONS.** Disconnect power and apply lockouts when required by this instruction. Refer to current local lockout procedures to properly shut down and lock out this machine. Check for suspicious dust or unusual debris. If any unusual substance is found, notify supervisor prior to proceeding with any further action on the equipment. **THE USE OF COMPRESSED OR BLOWN AIR IS PROHIBITED.** When cleaning is required, an alternative cleaning method such as a HEPA filtered vacuum cleaner or a damp rag must be used in place of compressed or blown air. A lint-free cloth or brush may be used on optical equipment only when other cleaning methods cannot be used. Report safety deficiencies to your supervisor immediately upon detection. **WARNING FOR EWP/PPE: Steps contained in this bulletin may require the use of Electrical Work Plan (EWP) Personal Protective Equipment (PPE). Refer to the current EWP MMO or appropriate EWP PPE and barricade requirements.** **WARNING: Various products requiring Safety Data Sheets (SDS) may be utilized during the performance of the procedures in this bulletin. Ensure the current SDS for each product used is on file and available to all employees. When reordering such a product, it is suggested that current SDS be requested. Refer to SDS for appropriate personal protective equipment.**	1	All			
MAIN MACHINE: MIS/USV CONTROL	2.**	**Perform system shutdown.** Shut down system using MS-178 Vol B Shutdown and Lockout Procedures.	5	09			D
MAIN MACHINE: MAIN ELECTRICAL CABINET	3.**	**Lock out power.** Lockout machine according to current local Energy Control Procedures.	5	All			D
SAR CABINET: SAR COMPUTER	4.	**Vacuum and check Secondary Address Reader (SAR) cabinet.**	1	07		440	

Part or Component	Item No	Task Statement and Instruction (Comply with all current safety precautions)	Est. Time Req (min)	Min. Skill Lev	Thresholds		
					Run Hours	Pieces Fed (000)	Freq.
		SAR cabinet filter is located in a slide tray under the cabinet. Replace when impacted dirt and debris cannot be removed by vacuuming.					
MIS/USV SYSTEM: ENTIRE SYSTEM	5.**	**Remove and clean filters.** Replace filters when impacted dirt and debris cannot be removed by vacuuming. 1. Clean filter in each rear door of the supervisor station. 2. Clean filter each computer (MIS and USV). 3. Reinstall all filters.	5	07			1
MAIN MACHINE: ENTIRE SYSTEM	6.**	**Mail search the entire AFSM100 System by performing the following steps:** 1. Perform mail search beginning at infeed station 1 by opening all hinged covers and doors on each infeed station, perform mail search and leave covers open. 2. Continue to the right side of the level change module by bin 1. Check for mail on perforated screen underneath bucket assemblies and on the floor. 3. Continue to the right side of the sort modules and perform a mail search beginning at bin 1, working toward the drive module. a. Remove any debris found on conveyor and/or conveyor photocells. b. Search for mail in mail chutes. 4. Continue to the Drive Module and search for mail on expanded metal guards under drive module at the entrance to the maintenance alley. 5. Continue to the left side of the sort modules and perform a mail search beginning at bin 61, working toward the level change module. a. Remove any debris found on conveyor and/or conveyor photocells. b. Search for mail in mail chutes. 6. Continue to the left side of the level change module by bin 120. Check for mail on perforated screen underneath bucket assemblies and on the floor.	16	07			D

Part or Component	Item No	Task Statement and Instruction (Comply with all current safety precautions)	Est. Time Req (min)	Min. Skill Lev	Thresholds		
					Run Hours	Pieces Fed (000)	Freq.
		7. Continue to the injector side of the infeed stations and check for mail on the floor underneath the injectors.					
INFEED STATION: FEEDER MODULE	7.**	**Remove debris.** 1. Remove any buildup of debris from the Destacker central vacuum chamber screen. 2. Remove visible debris such as loose FICS labels and mailpiece fragments. *3 minutes per feeder	9*	07		25	
INFEED STATION: FEEDER MODULE	8.**	**Remove dust and debris.** Vacuum and clean any accumulation of dust or debris from the mail transport in the feeder, OCR/ICS, and 950 modules. *3 minutes per infeed station	9*	07		220	
INFEED STATION: FEEDER MODULE	9.**	**Clean destacker module.** 1. Brush and vacuum the destacker low vacuum chamber plate. Replace the vacuum plate (PSN 3915-05-000-2458) when impacted debris cannot be removed by vacuuming. 2. Remove and clean the interior filter screen. Replace the interior filter (PSN 4330-05-000-2273) when impacted debris cannot be removed by vacuuming. 3. Remove canister filter and clean by vacuuming. Replace the canister filter (PSN 4330-05-000-2274) when impacted dirt and debris cannot be removed by vacuuming. * 4 minutes per infeed station.	12*	07		220	
INFEED STATION: FEEDER MODULE	10.**	**Check and clean feeder vacuum filters.** Clean destacker/tilter module vacuum filter. Replace filter when impacted dirt and debris cannot be removed by vacuuming. 1. Remove the filter element from the vacuum pump and clean by vacuuming with a HEPA vacuum. 2. Reinstall vacuum pump filter. * 2 minutes per infeed station.	6*	07		1540	
INFEED STATION: FEEDER MODULE	11.**	**Replace vacuum pump carbon vanes.** 1. Remove vacuum pump plastic front cover. 2. Remove vacuum pump regulator.	30*	07		13200	

Part or Component	Item No	Task Statement and Instruction (Comply with all current safety precautions)	Est. Time Req (min)	Min. Skill Lev	Thresholds		
					Run Hours	Pieces Fed (000)	Freq.
		3. Remove cast iron front cover. 4. Remove and replace all six carbon vanes (PSN 3455-05-000-7867). 5. Install the cast iron front cover. 6. Install the vacuum pump regulator. 7. Install the vacuum pump plastic cover. * 10 minutes per infeed station.					
INFEED STATION: FEEDER MODULE	12.**	**Replace the vacuum system MAC valves.** Remove and replace MAC valves. Contact Supervisor to schedule rebuild of MAC valves removed from the system. * 20 minutes per infeed station.	60*	09		13200	
INFEED STATION: ENTIRE SYSTEM	13.**	**Check condition and wear of infeed stations.** Note all deficiencies and notify the supervisor for scheduling of corrective maintenance. 1. Check feeder paddle mechanical condition for general wear and damage. 2. Check anti-doubler assembly for binding, dragging, damage to vacuum hose, nozzle condition, and general alignment and mechanical condition. 3. Check all presser arm assemblies for general alignment and mechanical condition. 4. Check for missing, loose, or damaged belts. Look for discoloration, belt residue, frayed edges, or rubbing. Make minor adjustments as necessary. 5. Check all pulleys and rollers for damage and wear. Wipe clean any accumulation of dust, label adhesive, or debris from the pulleys and rollers. 6. Check all photocells, emitters, and reflectors for loose retaining hardware and bent and/or broken brackets. 7. Check all shock dampers for oil leakage and proper mechanical condition and operation. 8. Check for broken or missing springs. 9. Check injector hardware, gantry, injector solenoids, springs, wheels, and pulleys for general wear and mechanical condition.	30*	09		220	

Part or Component	Item No	Task Statement and Instruction (Comply with all current safety precautions)	Est. Time Req (min)	Min. Skill Lev	Thresholds		
					Run Hours	Pieces Fed (000)	Freq.
		10. Check hinged covers while open, for damaged or leaking pneumatic cylinders. Replace worn or damaged pneumatic cylinders as necessary. 11. Check all clutch/brake sensors for damage or missing hardware/components. * 10 minutes per infeed station.					
INFEED STATION: FICS MODULE	14.**	**Clean OCR/FICS module.** **WARNING: Before performing any actions in the AV1222-1 scanner area, allow sufficient time for components to cool.** 1. Using a microfiber glove or lint free cloth, wipe down each AV1222-1 scanner window assembly and mounting plate. 2. Remove any accumulation of dust or debris from the aperture plate and surrounding area. This includes the removal FICS labels from pulleys, aperture, and baseplate. 3. Remove and clean AV1222-1 camera filters. Replace camera filters (PSN 4130-04-000-4014) when impacted dirt and debris cannot be removed by vacuuming. 4. Remove and clean FAR computer filter. This filter can be removed from the computer and washed with warm water. 5. Remove and clean CoBCR filters. Replace filter (PSN 4310-07-000-0176) when impacted dirt and debris cannot be removed by vacuuming. 6. Clean vacuum filter on FICS labeler. Replace filter (PSN 4130-04-000-4688) when impacted dirt and debris cannot be removed by vacuuming. 7. Using a microfiber glove or lint free cloth, wipe down the verifier lens and remove any buildup of dust and debris from in front of the verifier. * 6 minutes per infeed station.	18*	07		220	
INFEED STATION: FICS MODULE	15.**	**Clean and check FICS labeler.** **WARNING: Exercise care around knife cutting edge to prevent injuries.** 1. Clean labeler cutting blades with silicone oil. 2. Check labeler oil reservoir level. Replace oil bottle as necessary.	6*	09			D

Part or Component	Item No	Task Statement and Instruction (Comply with all current safety precautions)	Est. Time Req (min)	Min. Skill Lev	Thresholds		
					Run Hours	Pieces Fed (000)	Freq.
		* 2 minutes per infeed station.					
INFEED STATION: FICS MODULE	16.**	**Clean and check FICS Ink Jet Printer (IJP).** Perform the following steps on the IJP: 1. Remove printhead from sleeve. 2. Clean and check printhead. 3. Clean and check sleeve. 4. Clean back plate. 5. Install printhead back into sleeve. * 10 minutes per infeed station.	30*	09			D
INFEED STATION: FICS MODULE	17.**	**Check and clean FICS labeler.** **WARNING: Exercise care around knife cutting edge to prevent injuries.** 1. Place FICS labeler in maintenance position by opening FICS module rear door and rotating labeler latch in a counterclockwise direction. Pull handle on labeler until it is safely latched in the maintenance position. 2. Remove and clean labeler cutting blades. 3. Inspect blades for chips or damage, replace if damage or chips visible. 4. Inspect Delrin balls for wear (flat spots) and replace if worn. 5. Check labeler wick for damage or residue. Replace wick as necessary. 6. Lubricate wick with silicone oil. 7. Inspect stop block bumpers for damage or wear and replace if worn or damaged. 8. Inspect label paddle and stop bumper for wear or damage and replace if damaged or wear is excessive. 9. Clean label application roller using Scrubs in a Bucket towelette. 10. Inspect Label Feed Backup Roller for wear. Replace roller as necessary. 11. Inspect Labeler Back-up Idler (D27) for wear. Replace roller as necessary. 12. Check labeler oil level and replenish as necessary.	30*	09			1

Part or Component	Item No	Task Statement and Instruction (Comply with all current safety precautions)	Est. Time Req (min)	Min. Skill Lev	Thresholds		
					Run Hours	Pieces Fed (000)	Freq.
		13. Return FICS labeler to operational position. Pull up on latch plunger, push labeler in. Rotate labeler latch clockwise and close FICS module rear door. * 10 minutes per infeed station.					
INFEED STATION: FICS MODULE	18.**	**Replace OCR/FICS module IJP filter tube ink filter.** Replace IJP filter tube assembly. *5 minutes per infeed station.	15*	09		137500	
INFEED STATION: FICS MODULE	19.**	**Replace OCR/FICS module IJP primary ink filter.** Replace primary ink filter. *5 minutes per infeed station.	15*	09		39600	
LEVEL CHANGE MODULE: LEVEL CHANGE MODULE	20.**	**Clean and check level change module.** 1. Check door closer wheel for cracks, broken spokes, voids in wheel surface. 2. Clean the level change photocell array with a microfiber glove or lint free cloth.	2	07		220	
LEVEL CHANGE MODULE: LABEL PRINTER	21.**	**Clean Microcom label printer.** 1. Vacuum and clean Microcom label printer. 2. Clean Microcom label printer print head using a Q-tip lightly dampened with isopropyl alcohol or use thermal printer cleaning kit identified in MMO-004-03. *4 minutes per label printer.	8*	07		220	
LEVEL CHANGE MODULE: LEVEL CHANGE MODULE	22.**	**Check condensate trap and filter.** 1. Check for oil and/or water presence in condensate trap. Drain if water or oil is present. 2. Observe that filter indicator valve is green; red indicates filter replacement is necessary. Replace filter if red indicator is present.	1	07			1
TAKEAWAY CONVEYOR: ENTIRE SYSTEM	23.**	**Check Takeaway Conveyor Drive** 1. Remove side access cover from each takeaway conveyor. 2. Check drive belt condition and tension using procedures and specifications in handbook MS-178. Observe drive motor gearbox for	36	09		19800	

Part or Component	Item No	Task Statement and Instruction (Comply with all current safety precautions)	Est. Time Req (min)	Min. Skill Lev	Thresholds		
					Run Hours	Pieces Fed (000)	Freq.
		visible lubrication leaks. Tension and track belts when necessary. 3. Replace side access cover. * 18 minutes per takeaway conveyor.					
TAKEAWAY CONVEYOR: TAKEAWAY CONVEYOR	24.**	**Lubricate and check take away conveyor.** 1. Lubricate take away conveyor roller pillow block bearings (two each per side). Lubricate via grease fittings using lithium base #2 grease (Shell Avania or equivalent). 2. Check take away conveyor drive motor gearbox for visible lubrication leaks. Notify supervisor of any lubrication leaks. * 10 minutes per takeaway conveyor.	20*	07		39600	
SORT MODULE: ENTIRE SYSTEM	25.**	**Check for damaged components.** 1. Check for cracked buckets, missing bucket flaps, and buckets not even with adjacent buckets while cleaning. 2. Check tub full switch assembly/actuator for damage or breakage. 3. Check tub present switch assemblies for damage or breakage. * 15 minutes per side.	30*	09			M
SORT MODULE: ENTIRE SYSTEM	26.	**Remove dust and debris.** Vacuum any accumulation of dust and/or debris outside and inside of sort module (maintenance alley), including the floor. Remove all mail tub labels.	120	07		19800	
DRIVE MODULE: DRIVE MOTOR/BRAKE	27.**	**Remove, clean, lubricate, and install the 96-link main drive chain.** Refer to MS-178, Vol. B, Section 5.8.5 Removing and Replacing the Drive Module 96 Link Drive Chain.	45	07		39600	
DRIVE MODULE PULL CORD E-STOP	28.**	**Check condition and trip tension for pull cord E-stop.** Refer to MS-178 Vol. B, Section 4.8.4. Adjust as necessary.	2	09			M
MAIN MACHINE: MAIN ELECTRICAL CABINET	29.	**Vacuum main electrical cabinet.** Vacuum any accumulation of dust or debris.	2	07		19800	
INFEED STATION: FICS MODULE	30.	**Replace OCR/FICS module IJP vacuum filter**	6*	09		1540	

Part or Component	Item No	Task Statement and Instruction (Comply with all current safety precautions)	Est. Time Req (min)	Min. Skill Lev	Thresholds		
					Run Hours	Pieces Fed (000)	Freq.
		Inside of the IJP assembly locate, remove, and replace the vacuum filter. *2 minutes per infeed station					
INFEED STATION: ENTIRE SYSTEM	31.**	**Close all open doors and covers.**	4	07			D
MAIN MACHINE: MAIN ELECTRICAL CABINET	32.**	**Return AFSM100 to service.** **WARNING: Be cautious when working around or on equipment when power has been applied.** 1. Restore power to machine as prescribed by the local lockout procedure. 2. Observe the AFSM100 Status Screen on the MIS computer for the following: Machine Status=System Ready, NDSS-Available, USVPC-Connected, REC VCS-Connected, Site VCS-Connected, OCR/BCR1-Connected With VCS, OCR/BCR2-Connected With VCS, OCR/BCR3-Connected With VCS, Printer-On-Line, Right and Left Label Printer-Ready. 3. Notify supervisor of any problems.	12	09			D
SUPERVISOR STATION: MIS/USV CONTROL	33.**	**Perform database repair procedure.** **CAUTION: Do not interrupt recovery process. Database corruption or data loss could result.** 1. Log in as Maintenance 1. 2. Click on **System Administration** to Exit AFSM100 software. 3. Click on **Exit**. Click on **Yes**. 4. Start Windows NT Explorer by clicking on **Start** in lower left corner. 5. Click on **Programs**. 6. Click on **NT Explorer**. 7. Click on **MIS** directory box. 8. Click on **BIN** directory box. 9. Double click on **DBRepair.exe**. 10. Use dropdown **arrow** to select database to be repaired or select **All Databases** to repair all databases. Press Rebuild Database button to start the repair process. 11. After selected databases have been checked, a dialog box displays indicating length of time used to repair databases.	10	10			1

Part or Component	Item No	Task Statement and Instruction (Comply with all current safety precautions)	Est. Time Req (min)	Min. Skill Lev	Thresholds		
					Run Hours	Pieces Fed (000)	Freq.
		12. Press **OK** button to exit DBRepair utility. 13. Click on **X** in upper right hand corner to close NT Explorer . 14. Click on **Start**. 15. Click on **Shutdown**. 16. Click on **Restart Computer**. 17. Click on **Yes**. 18. After MIS software is fully functional, switch to the USV-PC screen. 19. Using Start menu, Shutdown and Restart Computer. 20. After USV PC is running, press reset button on the USV rack. 21. Cycle power to all three infeed stations. 22. Machine is ready to run.					
SUPERVISOR STATION: MIS/USV CONTROL	34.**	**Check MIS Alarms** Observe MIS alarm window for any Photoeye Low Gain Warnings. Clean, align, adjust, or replace any photoeye/reflector to correct the Low Gain Warning(s).	10	09			D
INFEED STATION: FICS MODULE	35.**	**Check OCR/FICS Scanner.** Check the white level on each scanner. Observe white level graph for acceptable pattern and adjust the white level only if it is more than 5 units above or below average value of 199. * 3 minutes per infeed station.	9*	10			1
INFEED STATION: FICS MODULE	36.**	**Check OCR/FICS.** 1. Start AFSM100 and infeed. Run camera alignment card and check for camera skew and clarity of image. 2. Check the Distance to Scanline on each scanner. Initiate action to correct shift in Distance to Scanline. 3. Note values and adjustments in equipment logbook. *10 minutes per infeed station.	30*	10		1540	
INFEED STATION: FICS MODULE	37.**	**Check FICS Ink Jet Printer (IJP)** 1. Check that IJP vacuum gauge reads between 12 and 13 inches in vacuum.	12*	10		1540	

Part or Component	Item No	Task Statement and Instruction (Comply with all current safety precautions)	Est. Time Req (min)	Min. Skill Lev	Thresholds		
					Run Hours	Pieces Fed (000)	Freq.
		2. Check IJP positive air with flow meter for 2.0 to 2.5 Standard Cubic Feet per Hour (SCFH). * 4 minutes per infeed station.					
INFEED STATION: ENTIRE SYSTEM	38.**	**Perform Photoeye Adjustments** Perform Feeder, FICS, and 950 Module Photoeye adjustments per MS-178, Volume B, Section 4. *15 minutes per infeed station	45*	09		1540	
INFEED STATION: ENTIRE SYSTEM	39.**	**Start the machine and each infeed; test each interlock switch.** 1. Open and close each cover and door, one at a time, and check interlocks. 2. Observe that infeed stops and the carousel continues to run for each infeed interlock switch. 3. Check that all associated lamps and messages on the operator control panel LCD display and Minitron display properly report each interlock switch actuation. 4. Observe that the carousel stops when any transport access cover or hood, over height safety hood, and maintenance alley gate are opened. Check that all associated lamps and messages on the operator control panel LCD display and Minitron display properly report each interlock switch actuation.	38	09			M
INFEED STATION: ENTIRE SYSTEM	40.**	**Check infeed station with ultrasound device.** 1. With the infeed station covers and doors open, start the infeed station. Using an ultrasound device and Airborne probe, listen for the following: 2. Abnormal bearing noise on each deck assembly along the top of the infeed module. 3. Abnormal bearing noise on the bottom of each deck plate on the infeed module. 4. Abnormal bearing and winding noise emanating from feeder motors. 5. Vacuum leaking on each MAC valve assembly. 6. Air leaking in the pneumatic system piping and components (i.e. hoses, vacuum tank, canister filter lid, etc.) 7. Vacuum pump bearings and vacuum leakage.	21*	09		1540	

Part or Component	Item No	Task Statement and Instruction (Comply with all current safety precautions)	Est. Time Req (min)	Min. Skill Lev	Thresholds		
					Run Hours	Pieces Fed (000)	Freq.
		8. Vacuum turbine motor bearings and vacuum leakage. 9. FICS Labeler pneumatics panel for air leakage. 10. Document all defective components for replacement. Close all covers and doors. * 7 minutes per infeed station.					
MAIN MACHINE: EMERGENCY STOPS	41.**	**Check carousel and infeed station E-Stops.** 1. Start the carousel and each infeed station. 2. Actuate E-Stop switch on operator control panel at Infeed Station #1. 3. Observe that the carousel and all infeed stations stop. 4. Observe that the lamp inside the E-Stop switch illuminates. 5. Observe that the control panel E-Stop light illuminates and the LCD display reports an E-Stop. 6. Observe that the sort module Minitron displays the appropriate E-Stop message. 7. Observe that red lights on the light stacks illuminate. 8. Repeat Steps 1-7 for all remaining system E-Stops 9. Document all defective components for repair or replacement.	45	07			M
MAIN MACHINE: ENTIRE SYSTEM	42.**	**Check infeed station injector and main carousel chain tension.** Refer to MS-178 Volume B Maintenance Information, Section 4 Alignment and Adjustment Procedures, Injector subsections. 1. Place Drive Motor Lockout switch lever in the OFF position and install lockout device. Remove bucket assemblies to provide access for infeed station injector check. 2. At the sort module on the left side, starting at the level change unit and working toward the drive module: a. Remove six bucket modules. b. Skip six bucket modules. c. Remove six more bucket modules.	105	09		6600	

Part or Component	Item No	Task Statement and Instruction (Comply with all current safety precautions)	Est. Time Req (min)	Min. Skill Lev	Thresholds		
					Run Hours	Pieces Fed (000)	Freq.
		d. Skip six bucket modules. e. Remove six bucket modules. 3. Remove lockout device and place Drive Motor Lockout switch lever in the ON position after bucket assemblies have been removed. 4. Position carousel chain. Run carousel until spaces from missing bucket assemblies are under the three infeed station injector modules. Press E-Stop switch when spaces from missing bucket assemblies are under the three infeed injection modules. 5. Perform system shutdown. Shut down system using MS-178 Vol B Shutdown and Lockout Procedures. 6. Lock out power. Power down the machine and lock out electrical power and compressed air as prescribed by the current local lockout instructions providing lockout/restore procedures. 7. Remove top center covers on tension module. 8. Check the GIO tachometer belt for damage. Check for debris on the pulleys. **CAUTION: If carousel chain tension is not within specification and adjustment is performed, initiate action to check alignment of level change and infeed station proximity switches. Use procedures and specifications published in handbook MS-178.** 9. Check and adjust, if necessary, main carousel chain tension. Using procedures and specifications published in handbook MS-178, check main carousel chain tension. 10. Check the main drive motor gearbox for visible lubricant leaks. Notify supervisor of lubricant leaks. 11. Check main drive motor brake. Check main drive motor brake solenoid air gap and friction disc thickness using procedures and specifications in handbook MS-178. 12. Check infeed station. (5 min per IFS) a. Injector area. Check for wear and debris. b. Check shock anti-wear plates and guide rail assembly for wear and damage.					

Part or Component	Item No	Task Statement and Instruction (Comply with all current safety precautions)	Est. Time Req (min)	Min. Skill Lev	Thresholds		
					Run Hours	Pieces Fed (000)	Freq.
		13. Install tension module covers removed earlier. Install top covers on tension module. **WARNING: Be cautious when working around or on equipment when power has been applied.** 14. Return to service. Restore power to machine as prescribed by the local lockout procedure. Observe the AFSM100 Status Screen on the MIS computer for the following: Machine Status=System Ready, NDSS-Available, USVPC-Connected, REC VCS-Connected, Site VCS-Connected, OCR/BCR1-Connected With VCS, OCR/BCR2-Connected With VCS, OCR/BCR3-Connected With VCS, Printer-On-Line, Right and Left Label Printer-Ready. Notify supervisor of any problems. 15. Start carousel and position carousel chain so spaces are accessible in sort module. Press E-Stop switch when all missing bucket assembly spaces are visible on one side of the sort modules. 16. Place Drive Motor Lockout switch lever in the OFF position and install lockout device. 17. Install bucket assemblies removed earlier. 18. Remove lockout device and place Drive Motor Lockout switch lever in the ON position after all bucket assemblies have been installed.					
MAIN MACHINE: ENTIRE SYSTEM	43.**	**Replace chain guide Teflon strips.** 1. Remove 12 consecutive bucket assemblies. Place Drive Motor Lockout switch lever in the OFF position and install lockout device. On the right side of the sort module, remove 12 consecutive bucket assemblies starting at the safety hood and working toward the level change unit. Remove lockout device and place Drive Motor Lockout switch lever in the ON position after bucket assemblies have been removed. 2. Position carousel chain. Run carousel and press E-Stop switch when space from missing bucket assemblies are at the left side level change. This will enable an unobstructed view of the left side level change Teflon wear strips later in the PM.	263	09		39600	

Part or Component	Item No	Task Statement and Instruction (Comply with all current safety precautions)	Est. Time Req (min)	Min. Skill Lev	Thresholds		
					Run Hours	Pieces Fed (000)	Freq.
		3. Perform system shutdown. Shut down system using MS-178 Vol B Shutdown and Lockout Procedures. 4. Lock out power. Power down the machine and lock out electrical power and compressed air as prescribed by the current local lockout instructions providing lockout/restore procedures. 5. Replace left side level change module Teflon strips. a. Remove two side covers on level change module. b. Remove the top six carrier brackets to expose the top left level change chain guide Teflon strip. c. Replace top level change Teflon strip PSN 3915-05-000-2308. d. Reinstall every other carrier bracket removed in Step 5b. e. Remove the lower six carrier brackets to expose the lower left level change chain guide Teflon strip. f. Replace lower level change Teflon strip PSN 3915-05-000-2308. g. Reinstall every other carrier bracket removed in Step 5e. h. Reinstall two left level change side covers i. Remove the four top tension module covers. 6. Return to service. Restore power to machine as prescribed by the local lockout procedure. Observe the AFSM100 Status Screen on the MIS computer for the following: Machine Status=System Ready, NDSS-Available, USVPC-Connected, REC VCS-Connected, Site VCS-Connected, OCR/BCR1-Connected With VCS, OCR/BCR2-Connected With VCS, OCR/BCR3-Connected With VCS, Printer-On-Line, Right and Left Label Printer-Ready. Notify supervisor of any problems.					

Part or Component	Item No	Task Statement and Instruction (Comply with all current safety precautions)	Est. Time Req (min)	Min. Skill Lev	Thresholds		
					Run Hours	Pieces Fed (000)	Freq.
		7. Position Carousel. Run carousel and press E-Stop switch when space from missing bucket assemblies are at the tension module. This will enable an unobstructed view of the tension module Teflon wear strip 8. Perform system shutdown. Shut down system using MS-178 Vol B Shutdown and Lockout Procedures. 9. Lock out power. Power down the machine and lock out electrical power and compressed air as prescribed by the current local lockout instructions providing lockout/restore procedures. 10. Remove the lower tension module guide rail. 11. Replace tension module Teflon chain guide strip. a. Remove carrier brackets to expose the tension module Teflon chain guide strip. b. Replace tension module Teflon chain guide strip PSN 3915-05-000-2312. c. Reinstall carrier brackets removed in Step 11a. d. Reinstall lower tension module guide rail. e. Reinstall four top tension module covers. 12. Remove two right side level change side covers. 13. Return to service. Restore power to machine as prescribed by the local lockout procedure. Observe the AFSM100 Status Screen on the MIS computer for the following: Machine Status=System Ready, NDSS-Available, USVPC-Connected, REC VCS-Connected, Site VCS-Connected, OCR/BCR1-Connected With VCS, OCR/BCR2-Connected With VCS, OCR/BCR3-Connected With VCS, Printer-On-Line, Right and Left Label Printer-Ready. Notify supervisor of any problems. 14. Position carousel. Run carousel and press E-Stop switch when space from missing bucket assemblies are at the right side level change module. This will enable an unobstructed view of the right side level change module Teflon wear strips					

Part or Component	Item No	Task Statement and Instruction (Comply with all current safety precautions)	Est. Time Req (min)	Min. Skill Lev	Thresholds		
					Run Hours	Pieces Fed (000)	Freq.
		15. Perform system shutdown. Shut down system using MS-178 Vol B Shutdown and Lockout Procedures. 16. Lock out power. Power down the machine and lock out electrical power and compressed air as prescribed by the current local lockout instructions providing lockout/restore procedures. 17. Replace right side level change module Teflon strips. a. Remove the top carrier brackets to expose the top right level change chain guide Teflon strip. b. Replace top level change Teflon strip PSN 3915-05-000-2308. c. Reinstall carrier brackets removed in Step 17a. d. Remove the lower carrier brackets to expose the lower right level change chain guide Teflon strip. e. Replace lower level change Teflon strip PSN 3915-05-000-2308. f. Reinstall carrier brackets removed in Step 17d. g. Reinstall two right level change side covers h. Remove the two end drive module covers. 18. Return to service. Restore power to machine as prescribed by the local lockout procedure. Observe the AFSM100 Status Screen on the MIS computer for the following: Machine Status=System Ready, NDSS-Available, USVPC-Connected, REC VCS-Connected, Site VCS-Connected, OCR/BCR1-Connected With VCS, OCR/BCR2-Connected With VCS, OCR/BCR3-Connected With VCS, Printer-On-Line, Right and Left Label Printer-Ready. Notify supervisor of any problems. 19. Position carousel. Run carousel and press E-Stop switch when space from missing bucket assemblies are at the drive module. This will enable an unobstructed view of the drive module Teflon wear strip					

Part or Component	Item No	Task Statement and Instruction (Comply with all current safety precautions)	Est. Time Req (min)	Min. Skill Lev	Thresholds		
					Run Hours	Pieces Fed (000)	Freq.
		20. Perform system shutdown. Shut down system using MS-178 Vol B Shutdown and Lockout Procedures. 21. Lock out power. Power down the machine and lock out electrical power and compressed air as prescribed by the current local lockout instructions providing lockout/restore procedures. 22. Remove the lower drive module guide rail. 23. Replace drive module Teflon chain guide strip. a. Remove carrier brackets to expose the drive module Teflon chain guide strip. b. Replace drive module Teflon chain guide strip PSN 3915-05-000-2312. c. Reinstall all carrier brackets. d. Reinstall lower drive module guide rail. e. Reinstall two end drive module covers. 24. Return to service. Restore power to machine as prescribed by the local lockout procedure. Observe the AFSM100 Status Screen on the MIS computer for the following: Machine Status=System Ready, NDSS-Available, USVPC-Connected, REC VCS-Connected, Site VCS-Connected, OCR/BCR1-Connected With VCS, OCR/BCR2-Connected With VCS, OCR/BCR3-Connected With VCS, Printer-On-Line, Right and Left Label Printer-Ready. Notify supervisor of any problems. 25. Position Carousel. Run carousel and press E-Stop switch when space from missing bucket assemblies are along the left side sort modules. This will enable the bucket assemblies to be replaced. 26. Replace 12 consecutive bucket assemblies. Place Drive Motor Lockout switch lever in the OFF position and install lockout device. On the left side of the sort module, install the 12 consecutive bucket assemblies removed in Step 1. Remove lockout device and place Drive Motor Lockout switch lever in the ON position after bucket assemblies have been installed.					

Part or Component	Item No	Task Statement and Instruction (Comply with all current safety precautions)	Est. Time Req (min)	Min. Skill Lev	Thresholds		
					Run Hours	Pieces Fed (000)	Freq.
		27. Check operation. Run the carousel and observe smooth transition of bucket/carrier bracket assemblies as they transition between level change, tension and drive module areas.					
MAIN MACHINE: SORT MODULE	44.**	**Observe the sort module alignment.** Start the carousel and observe bucket travel. Buckets should travel smoothly and not bounce. Note bucket number of any individual bucket that does not travel smoothly or bounces. Note module transition locations where bucket bouncing occurs. Notify supervisor of notations.	10	07		39600	
MAIN MACHINE: CARRIER BRACKET AND CHAIN ASSEMBLY	45.**	**Observe carrier bracket alignment.** Start the carousel, enter the maintenance alley, and observe the alignment of carrier brackets. All carrier bracket wheels should make contact with the rail. Adjust or replace carrier brackets that are not properly aligned or defective.	6	09		39600	
SORT MODULE: ENTIRE SYSTEM	46.**	**Check operation of carousel safety hoods, drive module brake, and torque limiter.** 1. Ensure there is no mail in bucket assemblies. 2. Insert a pliable piece of cardboard in a carrier bucket at chute #30. The cardboard should stick up above the top of the bucket sufficiently to actuate the safety hood at the entry to the drive module. 3. With safety hood in normal operating position, make two marks on safety hood drawer slide assembly: one mark 8” and another mark 11” from the frame to establish acceptable travel distance limits of the safety hood. 4. Start carousel. When cardboard strikes safety hood, observe that the carousel stops. The cardboard should move the safety hood between 8” and 11”. 5. Insert a pliable piece of cardboard in a carrier bucket at chute #90. 6. Repeat Steps 3 and 4 for the level change module safety hood. 7. If carousel does not stop within prescribed limits, or if excessive backlash is observed, initiate action to check main drive brake and torque-limiter adjustments.	5	09			M

Part or Component	Item No	Task Statement and Instruction (Comply with all current safety precautions)	Est. Time Req (min)	Min. Skill Lev	Thresholds		
					Run Hours	Pieces Fed (000)	Freq.
MAIN MACHINE: ENTIRE SYSTEM	47.**	**Check Infeed Station and Main Electrical Cabinet with thermal imaging device.** 1. Open the infeed station electrical panel doors and the main electrical cabinet door. 2. Scan the infeed station electrical panels (breaker panel and CCT board panel) for abnormal hot spots. 3. Scan the Main Electrical Cabinet panel for abnormal hot spots. 4. Close all open panel doors.	10	09		1540	
MAIN MACHINE: ENTIRE SYSTEM	48.**	**Run Daily Test Deck.** **Alternate between the MTSCEVEN and MTSCODD sortplans daily.** 1. Set up the AFSM100 to run the daily test deck using the MTSCEVEN or MTSCODD sortplan. Put the machine in BCR/OCR mode. 2. Load each 22 piece grouping on all three infeed stations and start the run. 3. Observe pick-off and vacuum gauge during the destacking of the mail. Open the feeder back door and observe that the vacuum gauge needle does not fluctuate more than five units as each mailpiece is fed. Verify that the vacuum recovers to high vacuum as each mailpiece is picked off. Close the feeder back door. 4. Perform an End of Run. 5. Collect test deck pieces from mail tubs. 6. Review FICS labels placement on template pieces for proper placement and remove FICS labels (approximately 33 labels to be removed). 7. Any piece failures should be noted and a work order generated for troubleshooting/corrective maintenance action.	24	09			D
INFEED STATION: FEEDER MODULE	49.**	**Run Feeder Performance Test Deck.** Get ready to run the 9-group performance deck by setting up test at MIS computer using sort program MTSCSG. Test each infeed station using performance deck provided with FEDR modification and print report. Generate a	75*	09		1540	

Part or Component	Item No	Task Statement and Instruction (Comply with all current safety precautions)	Est. Time Req (min)	Min. Skill Lev	Thresholds		
					Run Hours	Pieces Fed (000)	Freq.
		troubleshooting/corrective maintenance work order for stress groups not in tolerance. * 25 minutes per infeed station.					
FINAL-CLEANUP	50.**	**Clean up.** Ensure all tools, lubricants, rags, etc., are removed from the work area. Note deficiencies found and repairs performed in the Maintenance logbook. Notify supervisor and/or generate work orders per local SOP to document/initiate corrective maintenance activity for deficiencies found.	5	All			

Tasks marked with one asterisk*, after the time required, are per unit tasks.

Tasks marked with two asterisks**, after the item number, are critical tasks.

ATTACHMENT 3

AFSM100 (ATHS) MASTER CHECKLIST

03-AFSM100-AC-002-M

PREVENTIVE MAINTENANCE (PM)

Time Total: (758) minutes

U.S. Postal Service Maintenance Checklist	IDENTIFICATION															
	WORK CODE		EQUIPMENT ACRONYM								CLASS CODE		NUMBER			TYPE
	0	3	A	F	S	M	1	0	0		A	C	0	0	2	M
Equipment Nomenclature Automated Flat Sorting Machine 100	Equipment Model AFSM100 (ATHS)								Bulletin Filename mm20138				Occurrence eCBM			

Part or Component	Item No	Task Statement and Instruction (Comply with all current safety precautions)	Est. Time Req (min)	Min. Skill Lev	Thresholds		
					Run Hours	Pieces Fed (000)	Freq
SAFETY STATEMENT	1**	**COMPLY WITH ALL SAFETY PRECAUTIONS.** Disconnect power and apply lockouts when required by this instruction. Refer to current local lockout procedures to properly shut down and lock out this machine. Check for suspicious dust or unusual debris. If any unusual substance is found, notify supervisor prior to proceeding with any further action on the equipment. **THE USE OF COMPRESSED OR BLOWN AIR IS PROHIBITED.** When cleaning is required, an alternative cleaning method such as a HEPA filtered vacuum cleaner or a damp rag must be used in place of compressed or blown air. A lint-free cloth or brush may be used on optical equipment only when other cleaning methods cannot be used. Report safety deficiencies to your supervisor immediately upon detection. **WARNING FOR EWP/PPE: Steps contained in this bulletin may require the use of Electrical Work Plan (EWP) Personal Protective Equipment (PPE). Refer to the current EWP MMO or appropriate EWP PPE and barricade requirements.** **WARNING: Various products requiring Safety Data Sheets (SDS) may be utilized during the performance of the procedures in this bulletin. Ensure the current SDS for each product used is on file and available to all employees. When reordering such a product, it is suggested that current SDS be requested. Refer to SDS for appropriate personal protective equipment.**	1	All			
MAIN MACHINE: MIS/USV CONTROL	2**	**Perform system shutdown.** Shut down system using MS-178 Vol B Shutdown and Lockout Procedures.	5	09			D
MAIN MACHINE: MAIN ELECTRICAL CABINET	3**	**Lock out power.** Lockout machine according to current local Energy Control Procedures.	5	All			D
SAR CABINET: SAR COMPUTER	4	**Vacuum and check Secondary Address Reader (SAR) cabinet.**	1	07		440	

Part or Component	Item No	Task Statement and Instruction (Comply with all current safety precautions)	Est. Time Req (min)	Min. Skill Lev	Thresholds		
					Run Hours	Pieces Fed (000)	Freq
		SAR cabinet filter is located in a slide tray under the cabinet. Replace when impacted dirt and debris cannot be removed by vacuuming.					
MIS/USV SYSTEM: ENTIRE SYSTEM	5**	**Remove and clean filters.** Replace filters when impacted dirt and debris cannot be removed by vacuuming. 1. Clean filter in each rear door of the supervisor station. 2. Clean filter each computer (MIS and USV). 3. Reinstall all filters.	5	07			1
MAIN MACHINE: ENTIRE SYSTEM	6**	**Mail search the entire AFSM100 System by performing the following steps:** 1. Perform mail search beginning at infeed station 1 by opening all hinged covers and doors on each infeed station, perform mail search and leave covers open. 2. Continue to the right side of the level change module by bin 1. Check for mail on perforated screen underneath bucket assemblies and on the floor. 3. Continue to the right side of the sort modules and perform a mail search beginning at bin 1, working toward the drive module. a. Remove any debris found on conveyor and/or conveyor photocells. b. Search for mail in mail chutes. 4. Continue to the Drive Module and search for mail on expanded metal guards under drive module at the entrance to the maintenance alley. 5. Continue on the left side of the sort modules and perform a mail search beginning at bin 61, working toward the level change module. a. Remove any debris found on conveyor and/or conveyor photocells. b. Search for mail in mail chutes. 6. Continue to the left side of the level change module by bin 120. Check for mail on perforated screen underneath bucket assemblies and on the floor.	16	07			D

Part or Component	Item No	Task Statement and Instruction (Comply with all current safety precautions)	Est. Time Req (min)	Min. Skill Lev	Thresholds		
					Run Hours	Pieces Fed (000)	Freq
		7. Continue to the injector side of the infeed stations and check for mail on the floor underneath the injectors.					
INFEED STATION: ENTIRE SYSTEM	7**	**Remove debris.** 1. Remove any buildup of debris from the Destacker central vacuum chamber screen. 2. Remove visible debris such as loose FICS labels and mailpiece fragments. *3 minutes per feeder	9*	07		25	
INFEED STATION: FEEDER MODULE	8**	**Remove dust and debris.** Vacuum and clean any accumulation of dust or debris from the mail transport in the feeder, OCR/ICS, and 950 modules. *3 minutes per infeed station.	9*	07		220	
INFEED STATION: FEEDER MODULE	9**	**Clean destacker module.** 1. Brush and vacuum the destacker low vacuum chamber plate. Replace the vacuum plate (PSN 3915-05-000-2458) when impacted debris cannot be removed by vacuuming. 2. Remove and clean the interior filter screen. Replace the interior filter (PSN 4330-05-000-2273) when impacted debris cannot be removed by vacuuming. 3. Remove canister filter and clean by vacuuming. Replace the canister filter (PSN 4330-05-000-2274) when impacted dirt and debris cannot be removed by vacuuming. * 4 minutes per infeed station.	12*	07		220	
INFEED STATION: FEEDER MODULE	10**	**Check and clean feeder vacuum filters.** Clean destacker/tilter module vacuum filter. Replace filter when impacted dirt and debris cannot be removed by vacuuming. 1. Remove the filter element from the vacuum pump and clean by vacuuming with a HEPA vacuum. 2. Reinstall vacuum pump filter. * 2 minutes per infeed station.	6*	07		1540	
INFEED STATION: FEEDER MODULE	11**	**Replace vacuum pump carbon vanes.** 1. Remove vacuum pump plastic front cover. 2. Remove vacuum pump regulator.	30*	07		13200	

Part or Component	Item No	Task Statement and Instruction (Comply with all current safety precautions)	Est. Time Req (min)	Min. Skill Lev	Thresholds		
					Run Hours	Pieces Fed (000)	Freq
		3. Remove cast iron front cover. 4. Remove and replace all six carbon vanes PSN 3455-05-000-7867. 5. Install the cast iron front cover. 6. Install the vacuum pump regulator. 7. Install the vacuum pump plastic cover. * 10 minutes per infeed station.					
INFEED STATION: FEEDER MODULE	12**	**Replace the vacuum system MAC Valves.** Remove and replace MAC valves. Contact Supervisor to schedule rebuild of MAC valves removed from the system. * 20 minutes per infeed station.	60*	09		13200	
INFEED STATION: ENTIRE SYSTEM	13**	**Check condition and wear of infeed stations.** Note all deficiencies and notify the supervisor for scheduling of corrective maintenance. 1. Check feeder paddle mechanical condition for general wear and damage. 2. Check anti-doubler assembly for binding, dragging, damage to vacuum hose, nozzle condition, and general alignment and mechanical condition. 3. Check all presser arm assemblies for general alignment/tension and mechanical condition. 4. Check for missing, loose, or damaged belts. Look for discoloration, belt residue, frayed edges, or rubbing. Make minor adjustments as necessary. 5. Check all pulleys and rollers for damage and wear. Wipe clean any accumulation of dust, label adhesive, or debris from the pulleys and rollers. 6. Check all photocells, emitters, and reflectors for loose retaining hardware and bent and/or broken brackets. 7. Check all shock dampers for oil leakage and proper mechanical condition and operation. 8. Check for broken or missing springs. 9. Check injector hardware, gantry, injector solenoids, springs, wheels, and pulleys for general wear and mechanical condition.	30*	09		220	

Part or Component	Item No	Task Statement and Instruction (Comply with all current safety precautions)	Est. Time Req (min)	Min. Skill Lev	Thresholds		
					Run Hours	Pieces Fed (000)	Freq
		10. Check hinged covers while open, for damaged or leaking pneumatic cylinders. Replace worn or damaged pneumatic cylinders as necessary. 11. Check all clutch/brake sensors for damage or missing hardware/components. * 10 minutes per infeed station.					
INFEED STATION: FICS MODULE	14**	**Clean OCR/FICS module.** **WARNING: Before performing any actions in the AV1222-1 scanner area, allow sufficient time for components to cool.** 1. Using a microfiber glove or lint free cloth, wipe down each AV1222-1 scanner window assembly and mounting plate. 2. Remove any accumulation of dust or debris from the aperture plate and surrounding area. This includes the removal FICS labels from pulleys, aperture, and baseplate. 3. Remove and clean AV1222-1 camera filters. Replace camera filters (PSN 4130-04-000-4014) when impacted dirt and debris cannot be removed by vacuuming. 4. Remove and clean FAR computer filter. This filter can be removed from the computer and washed with warm water. 5. Remove and clean CoBCR filters. Replace filter (PSN 4310-07-000-0176) when impacted dirt and debris cannot be removed by vacuuming. 6. Clean vacuum filter on FICS labeler. Replace filter (PSN 4130-04-000-4688) when impacted dirt and debris cannot be removed by vacuuming. 7. Using a microfiber glove or lint free cloth, wipe down the verifier lens and remove any buildup of dust and debris from in front of the verifier. * 6 minutes per infeed station.	18*	07		220	
INFEED STATION: FICS MODULE	15**	**Clean and check FICS labeler.** **WARNING: Exercise care around knife cutting edge to prevent injuries.** 1. Clean labeler cutting blades with silicone oil. 2. Check labeler oil reservoir level and replace oil bottle as necessary.	6*	09			D

Part or Component	Item No	Task Statement and Instruction (Comply with all current safety precautions)	Est. Time Req (min)	Min. Skill Lev	Thresholds		
					Run Hours	Pieces Fed (000)	Freq
		* 2 minutes per infeed station.					
INFEED STATION: FICS MODULE	16**	**Clean and check FICS Ink Jet Printer (IJP).** Perform the following steps on the IJP: 1. Remove printhead from sleeve. 2. Clean and check printhead. 3. Clean and check sleeve. 4. Clean back plate. 5. Install printhead back into sleeve. *10 minutes per infeed station.	30*	09			D
INFEED STATION: FICS MODULE	17**	**Check and clean FICS labeler.** **WARNING: Exercise care around knife cutting edge to prevent injuries.** 1. Place FICS labeler in maintenance position by opening FICS module rear door and rotating labeler latch in a counterclockwise direction. Pull handle on labeler until it is safely latched in the maintenance position. 2. Remove and clean labeler cutting blades. 3. Inspect blades for chips or damage, replace if damage or chips visible. 4. Inspect Delrin balls for wear (flat spots) and replace if worn. 5. Check labeler wick for damage or residue. Replace wick as necessary. 6. Lubricate wick with silicone oil. 7. Inspect stop block bumpers for damage or wear and replace if worn or damaged. 8. Inspect label paddle and stop bumper for wear or damage and replace if damaged or wear is excessive. 9. Clean label application roller using Scrubs in a Bucket towelette. 10. Inspect Label Feed Backup Roller for wear. Replace roller as necessary. 11. Inspect Labeler Back-up Idler (D27) for wear. Replace roller as necessary. 12. Check labeler oil level and replenish as necessary.	30*	09			1

Part or Component	Item No	Task Statement and Instruction (Comply with all current safety precautions)	Est. Time Req (min)	Min. Skill Lev	Thresholds		
					Run Hours	Pieces Fed (000)	Freq
		13. Return FICS labeler to operational position. Pull up on latch plunger, push labeler in. Rotate labeler latch clockwise and close FICS module rear door. * 10 minutes per infeed station.					
INFEED STATION: FICS MODULE	18	**Replace OCR/FICS module IJP Vacuum Filter** Inside of the IJP assembly locate, remove, and replace the vacuum filter. *2 minutes per infeed station	6*	09		1540	
INFEED STATION: FICS MODULE	19**	**Replace OCR/FICS module IJP filter tube and primary ink filter.** Replace IJP filter tube assembly. *5 minutes per infeed station.	15*	09		137500	
LEVEL CHANGE MODULE: LEVEL CHANGE MODULE	20**	**Clean and check level change module.** 1. Check door closer wheel for cracks, broken spokes, and voids in wheel surface. 2. Clean the level change photocell array with a microfiber glove or lint free cloth.	2	07		220	
LEVEL CHANGE MODULE: LEVEL CHANGE MODULE	21**	**Check condensate trap and filter.** Check for oil and/or water presence in condensate trap. Drain if water or oil is present. Observe that filter indicator valve is green; red indicates filter replacement is necessary. Replace filter if red indicator is present.	1	07			1
ATHS: ENTIRE SYSTEM	22**	**Check and clean ATHS.** Note any deficiencies found during the following steps and contact a supervisor if any of the belts require replacement. 1. Check accumulation conveyor belts for wear, improper tracking, and damage. Clean all accumulation conveyor photocells using a microfiber glove or lint free cloth. 2. Check incline conveyor belts for wear, improper tracking, and damage. Clean all incline conveyor photocells using a microfiber glove or lint free cloth. 3. Check automatic tray destacker belts for wear or damage. Clean all destacker photocells using a microfiber glove or lint free cloth.	30*	09		220	

Part or Component	Item No	Task Statement and Instruction (Comply with all current safety precautions)	Est. Time Req (min)	Min. Skill Lev	Thresholds		
					Run Hours	Pieces Fed (000)	Freq
		4. Check automatic tray destacker puller springs for wear and/or over stretching. Replace springs as necessary. 5. Check transfer module conveyor belts for wear, improper tracking, and damage. Ensure that the tabs on the transfer belts are adjusted properly so that empty tubs are square when transferred to the print/apply module. Clean all transfer module conveyor photocells using a microfiber glove or lint free cloth. 6. Clean the transfer module camera lens using a microfiber glove or lint free cloth. 7. Clean the SICK scanner lenses using a microfiber glove or lint free cloth. 8. Check the lift/rotate assembly belts and lift assembly for wear or damage. 9. Check all insert/extract modules for missing or damaged round belts. 10. Check discharge conveyor for missing or damaged round belts. * 15 minutes per side.					
ATHS: ATHS INSERT/EXTRACT MODULE	23	**Clean ATHS insert/extract module outer guard rail.** Use soft, lint-free cloth Scrubs in a Bucket to remove build-up of gummy adhesive residue. Dispose of cloth when it becomes soiled. * 10 minutes per side.	20*	07			1
ATHS: ATHS PRINT/APPLY MODULE	24**	**Check and clean ATHS labeler and printer.** 1. Check labeler air filter condition. Replace filter if dirty or clogged. 2. Check labeler brush for wear or damage. Replace brush as necessary. 3. Remove air line from printer. 4. Confirm that no air pressure registers on pressure gauge. 5. Open label lid. 6. Rotate head release arm until latch releases. 7. Unlatch label hold down by depressing thumb latch. 8. Remove backing paper in stock path.	20*	09			D

Part or Component	Item No	Task Statement and Instruction (Comply with all current safety precautions)	Est. Time Req (min)	Min. Skill Lev	Thresholds		
					Run Hours	Pieces Fed (000)	Freq
		9. Release brass nip roller hold-down. 10. Clean nip roller, label pressure rollers, actuator roller, paper end switch, and platen. Use soft, lint free cloth and Scrubs in a Bucket to remove any build up of adhesive residue. Dispose of cloth when it becomes soiled. 11. Replace backing paper in stock path. 12. Reinstall air line to printer. 13. Close and latch label hold-down and head release arm. 14. Close label lid. * 10 minutes per side.					
SORT MODULE: ENTIRE SYSTEM	25**	**Check for damaged components.** 1. Check for cracked buckets, missing bucket flaps, and buckets not even with adjacent buckets while cleaning. 2. Check tub full photoeye for scratched and/or cracked lens 3. Check tub present photoeye for scratched and/or cracked lens. *15 minutes per side.	30*	07			M
SORT MODULE: ENTIRE SYSTEM	26	**Remove dust and debris.** Vacuum any accumulation of dust and/or debris outside and inside of sorter module (maintenance alley), including floor. Remove all buildup of ATHS tray labels from insert/extract modules.	120	07		19800	
DRIVE MODULE: DRIVE MOTOR/BRAKE	27**	**Remove, clean, lubricate, and install the 96-link main drive chain.** Refer to MS-178, Vol. B, Section 5.8.5 Removing and Replacing the Drive Module 96 Link Drive Chain.	45	07		39600	
DRIVE MODULE PULL CORD E-STOP	28**	**Check condition and trip tension for pull cord E-stop.** Refer to MS-178 Vol. B, Section 4.8.4. Adjust as necessary.	2	09			M
MAIN MACHINE: MAIN ELECTRICAL CABINET	29	**Vacuum main electrical cabinet.** Vacuum any accumulation of dust or debris.	2	07		19800	
MAIN MACHINE: ENTIRE SYSTEM	30**	**Close all open doors and covers.**	4	07			D

Part or Component	Item No	Task Statement and Instruction (Comply with all current safety precautions)	Est. Time Req (min)	Min. Skill Lev	Thresholds		
					Run Hours	Pieces Fed (000)	Freq
MAIN MACHINE: MAIN ELECTRICAL CABINET	31**	**Return AFSM100 to service.** **WARNING: Be cautious when working around or on equipment when power has been applied.** 1. Restore power to machine as prescribed by the local lockout procedure. 2. Observe the AFSM100 Status Screen on the MIS computer for the following: Machine Status=System Ready, NDSS-Available, USVPC-Connected, REC VCS-Connected, Site VCS-Connected, OCR/BCR1-Connected With VCS, OCR/BCR2-Connected With VCS, OCR/BCR3-Connected With VCS, Printer-On-Line, Right and Left Label Printer-Ready. 3. Notify supervisor of any problems.	12	09			D
SUPERVISOR STATION: MIS/USV CONTROL	32**	**Perform database repair procedure.** **CAUTION: Do not interrupt recovery process. Database corruption or data loss could result.** 1. Log in as Maintenance 1. 2. Exit AFSM100 software by clicking on System Administration. 3. Click on **Exit**. Click on **Yes**. 4. Start Windows NT Explorer by clicking on **Start** in lower left corner. 5. Click on **Programs**. 6. Click on **NT Explorer**. 7. Click on **MIS** directory box. 8. Click on **BIN** directory box. 9. Double click on **DBRepair.exe**. 10. Use dropdown arrow to select database to be repaired or select **All Databases** to repair all databases. Press **Rebuild Database** button to start the repair process. 11. After selected databases have been checked, a dialog box displays indicating length of time used to repair databases. 12. Exit DBRepair utility by pressing **OK** button. 13. Close NT Explorer by clicking on **X** in upper right hand corner. 14. Click on **Start**.	10	10			1

Part or Component	Item No	Task Statement and Instruction (Comply with all current safety precautions)	Est. Time Req (min)	Min. Skill Lev	Thresholds		
					Run Hours	Pieces Fed (000)	Freq
		15. Click on **Shutdown**. 16. Click on **Restart Computer.** 17. Click on **Yes**. 18. After MIS software is fully functional, switch to the USV-PC screen. 19. Using Start menu, Shutdown and Restart Computer. 20. After USV PC is running, press reset button on the USV rack. 21. Cycle power to all three infeed stations. 22. Machine is ready to run.					
SUPERVISOR STATION: MIS/USV CONTROL	33**	**Check MIS Alarms** 1. Observe MIS alarm window for Photoeye Low Gain Warnings. Clean, align, adjust, or replace any photoeye/reflector to correct the Low Gain Warning(s). 2. Observe MIS alarm window for ATHS PLC or Servo Low Battery Alarms. Replace low batteries.	10	09			D
INFEED STATION: FICS MODULE	34**	**Check OCR/FICS Scanner.** Check the white level on each scanner. Observe white level graph for acceptable pattern and adjust the white level only if it is more than 5 units above or below average value of 199. * 3 minutes per infeed station.	9*	10			1
INFEED STATION: FICS MODULE	35**	**Check OCR/FICS.** 1. Start AFSM100 and infeed. Run camera alignment card and check for camera skew and clarity of image. 2. Check the Distance to Scanline on each scanner. Initiate action to correct shift in Distance to Scanline. 3. Note values and adjustments in equipment logbook. * 10 minutes per infeed station.	30*	10		1540	
INFEED STATION: FICS MODULE	36**	**Check FICS Ink Jet Printer (IJP).** 1. Check that IJP vacuum gauge reads between 12 and 13 inches in vacuum.	12*	10		1540	

Part or Component	Item No	Task Statement and Instruction (Comply with all current safety precautions)	Est. Time Req (min)	Min. Skill Lev	Thresholds		
					Run Hours	Pieces Fed (000)	Freq
		2. Check IJP positive air with flow meter for 2.0 to 2.5 Standard Cubic Feet per Hour (SCFH). * 4 minutes per infeed station.					
INFEED STATION: ENTIRE SYSTEM	37**	**Perform Photoeye Adjustments** Perform Feeder, FICS, and 950 Module Photoeye adjustments per MS-178, Volume B, Section 4. *15 minutes per infeed station	45*	09		1540	
INFEED STATION: ENTIRE SYSTEM	38**	**Start the machine and each infeed; test each interlock switch.** 1. Open and close each cover and door, one at a time, and check interlocks. 2. Observe that infeed stops and the carousel continues to run for each infeed interlock switch. Check that all associated lamps and messages on the operator control panel LCD display and Minitron display properly report each interlock switch actuation. 3. Observe that the carousel stops when any transport access cover or hood, over height safety hood, and maintenance alley gate are opened. Check that all associated lamps and messages on the operator control panel LCD display and Minitron display properly report each interlock switch actuation. 4. On ATHS equipped machines, open and close each tub destacker door and level change module access door. Check that all associated lamps and messages on the operator control panel LCD display and Minitron display properly report each interlock switch actuation.	40	09			M
INFEED STATION: ENTIRE SYSTEM	39**	**Check infeed station with ultrasonic device.** With the infeed station covers and doors open, start the infeed station. Using an ultrasonic device and Airborne probe, listen for the following: 1. Abnormal bearing noise on each deck assembly along the top of the infeed module. 2. Abnormal bearing noise on the bottom of each deck plate on the infeed module. 3. Abnormal bearing and winding noise emanating from feeder motors. 4. Vacuum leaking on each MAC valve assembly.	21*	09		1540	

Part or Component	Item No	Task Statement and Instruction (Comply with all current safety precautions)	Est. Time Req (min)	Min. Skill Lev	Thresholds		
					Run Hours	Pieces Fed (000)	Freq
		5. Air leaking in the pneumatic system piping and components (i.e. hoses, vacuum tank, canister filter lid, etc.). 6. Vacuum pump bearings and vacuum leakage. 7. Vacuum turbine motor bearings and vacuum leakage. 8. FICS Labeler pneumatics panel for air leakage. 9. Document all defective components for replacement. Close all covers and doors. *7 minutes per infeed station.					
MAIN MACHINE: EMERGENCY STOPS	40**	**Check ATHS, carousel and infeed station E-Stops.** 1. Start the carousel and each infeed station. 2. Actuate E-Stop switch on operator control panel at Infeed Station #1. 3. Observe that the carousel and all infeed stations stop. 4. Observe that the lamp inside the E-Stop switch illuminates. 5. Observe that the control panel E-Stop light illuminates and the LCD display reports an E-Stop. 6. Observe that the sort module Minitron displays the appropriate E-Stop message. 7. Observe that red lights on the light stacks illuminate. 8. Repeat Steps 1-7 for all remaining system E-Stops 9. Document all defective components for repair or replacement.	60	07			M
MAIN MACHINE: ENTIRE SYSTEM	41**	**Check infeed station injector and main carousel chain tension.** Refer to MS-178 Volume B Maintenance Information, Section 4 Alignment and Adjustment Procedures, Injector sub-sections. 1. Place Drive Motor Lockout switch lever in the OFF position and install lockout device. Remove bucket assemblies to provide access for infeed station injector check.	105	09		6600	

Part or Component	Item No	Task Statement and Instruction (Comply with all current safety precautions)	Est. Time Req (min)	Min. Skill Lev	Thresholds		
					Run Hours	Pieces Fed (000)	Freq
		2. At the sort module on the left side, starting at the level change unit and working toward the drive module: a. Remove six bucket modules. b. Skip six bucket modules. c. Remove six more bucket modules. d. Skip six bucket modules. e. Remove six bucket modules. 3. Remove lockout device and place Drive Motor Lockout switch lever in the ON position after bucket assemblies have been removed. 4. Position carousel chain. Run carousel until spaces from missing bucket assemblies are under the three infeed station injector modules. Press E-Stop switch when spaces from missing bucket assemblies are under the three infeed injection modules. 5. Perform system shutdown. Shut down system using MS-178 Vol B Shutdown and Lockout Procedures. 6. Lock out power. Power down the machine and lock out electrical power and compressed air as prescribed by the current local lockout instructions providing lockout/restore procedures. 7. Remove top center covers on tension module. 8. Check the GIO tachometer belt for damage. Check for debris on the pulleys. **CAUTION: If carousel chain tension is not within specification and adjustment is performed, initiate action to check alignment of level change and infeed station proximity switches. Use procedures and specifications published in handbook MS-178.** 9. Check and adjust, if necessary, main carousel chain tension. Using procedures and specifications published in handbook MS-178, check main carousel chain tension. 10. Check the main drive motor gearbox for visible lubricant leaks. Notify supervisor of lubricant leaks.					

Part or Component	Item No	Task Statement and Instruction (Comply with all current safety precautions)	Est. Time Req (min)	Min. Skill Lev	Thresholds		
					Run Hours	Pieces Fed (000)	Freq
		11. Check main drive motor brake. Check main drive motor brake solenoid air gap and friction disc thickness using procedures and specifications in handbook MS-178. 12. Check infeed station. (5 min per IFS) a. Injector area. Check for wear and debris. b. Check shock anti-wear plates and guide rail assembly for wear and damage. 13. Install tension module covers removed earlier. Install top covers on tension module. **WARNING: Be cautious when working around or on equipment when power has been applied.** 14. Return to service. Restore power to machine as prescribed by the local lockout procedure. Observe the AFSM100 Status Screen on the MIS computer for the following: Machine Status=System Ready, NDSS-Available, USVPC-Connected, REC VCS-Connected, Site VCS-Connected, OCR/BCR1-Connected With VCS, OCR/BCR2-Connected With VCS, OCR/BCR3-Connected With VCS, Printer-On-Line, Right and Left Label Printer-Ready. Notify supervisor of any problems. 15. Start carousel and position carousel chain so spaces are accessible in sort module. Press E-Stop switch when all missing bucket assembly spaces are visible on one side of the sort modules. 16. Place Drive Motor Lockout switch lever in the OFF position and install lockout device. 17. Install bucket assemblies removed earlier. 18. Remove lockout device and place Drive Motor Lockout switch lever in the ON position after all bucket assemblies have been installed.					

Part or Component	Item No	Task Statement and Instruction (Comply with all current safety precautions)	Est. Time Req (min)	Min. Skill Lev	Thresholds		
					Run Hours	Pieces Fed (000)	Freq
MAIN MACHINE: ENTIRE SYSTEM	42**	**Replace chain guide Teflon strips.** 1. Remove 12 consecutive bucket assemblies. Place Drive Motor Lockout switch lever in the OFF position and install lockout device. On the right side of the sort module, remove 12 consecutive bucket assemblies starting at the safety hood and working toward the level change unit. Remove lockout device and place Drive Motor Lockout switch lever in the ON position after bucket assemblies have been removed. 2. Position carousel chain. Run carousel and press E-Stop switch when space from missing bucket assemblies are at the left side level change. This will enable an unobstructed view of the left side level change Teflon wear strips later in the PM. 3. Perform system shutdown. Shut down system using MS-178 Vol B Shutdown and Lockout Procedures. 4. Lock out power. Power down the machine and lock out electrical power and compressed air as prescribed by the current local lockout instructions providing lockout/restore procedures. 5. Replace left side level change module Teflon strips. a. Remove two side covers on level change module. b. Remove the top six carrier brackets to expose the top left level change chain guide Teflon strip. c. Replace top level change Teflon strip PSN 3915-05-000-2308. d. Reinstall every other carrier bracket removed in Step 5b. e. Remove the lower six carrier brackets to expose the lower left level change chain guide Teflon strip. f. Replace lower level change Teflon strip PSN 3915-05-000-2308. g. Reinstall every other carrier bracket removed in Step 5e.	263	09		39600	

Part or Component	Item No	Task Statement and Instruction (Comply with all current safety precautions)	Est. Time Req (min)	Min. Skill Lev	Thresholds		
					Run Hours	Pieces Fed (000)	Freq
		h. Reinstall two left level change side covers. i. Remove the four top tension module covers. 6. Return to service. Restore power to machine as prescribed by the local lockout procedure. Observe the AFSM100 Status Screen on the MIS computer for the following: Machine Status=System Ready, NDSS-Available, USVPC-Connected, REC VCS-Connected, Site VCS-Connected, OCR/BCR1-Connected With VCS, OCR/BCR2-Connected With VCS, OCR/BCR3-Connected With VCS, Printer-On-Line, Right and Left Label Printer-Ready. Notify supervisor of any problems. 7. Position Carousel. Run carousel and press E-Stop switch when space from missing bucket assemblies are at the tension module. This will enable an unobstructed view of the tension module Teflon wear strip 8. Perform system shutdown. Shut down system using MS-178 Vol B Shutdown and Lockout Procedures. 9. Lock out power. Power down the machine and lock out electrical power and compressed air as prescribed by the current local lockout instructions providing lockout/restore procedures. 10. Remove the lower tension module guide rail. 11. Replace tension module Teflon chain guide strip. a. Remove carrier brackets to expose the tension module Teflon chain guide strip. b. Replace tension module Teflon chain guide strip PSN 3915-05-000-2312. c. Reinstall carrier brackets removed in Step 11a. d. Reinstall lower tension module guide rail. e. Reinstall four top tension module covers. 12. Remove two right side level change side covers.					

Part or Component	Item No	Task Statement and Instruction (Comply with all current safety precautions)	Est. Time Req (min)	Min. Skill Lev	Thresholds		
					Run Hours	Pieces Fed (000)	Freq
		13. Return to service. Restore power to machine as prescribed by the local lockout procedure. Observe the AFSM100 Status Screen on the MIS computer for the following: Machine Status=System Ready, NDSS-Available, USVPC-Connected, REC VCS-Connected, Site VCS-Connected, OCR/BCR1-Connected With VCS, OCR/BCR2-Connected With VCS, OCR/BCR3-Connected With VCS, Printer-On-Line, Right and Left Label Printer-Ready. Notify supervisor of any problems. 14. Position carousel. Run carousel and press E-Stop switch when space from missing bucket assemblies are at the right side level change module. This will enable an unobstructed view of the right side level change module Teflon wear strips 15. Perform system shutdown. Shut down system using MS-178 Vol B Shutdown and Lockout Procedures. 16. Lock out power. Power down the machine and lock out electrical power and compressed air as prescribed by the current local lockout instructions providing lockout/restore procedures. 17. Replace right side level change module Teflon strips. a. Remove the top carrier brackets to expose the top right level change chain guide Teflon strip. b. Replace top level change Teflon strip PSN 3915-05-000-2308. c. Reinstall carrier brackets removed in Step 17a. d. Remove the lower carrier brackets to expose the lower right level change chain guide Teflon strip. e. Replace lower level change Teflon strip PSN 3915-05-000-2308. f. Reinstall carrier brackets removed in Step 17d. g. Reinstall two right level change side covers h. Remove the two end drive module covers.					

Part or Component	Item No	Task Statement and Instruction (Comply with all current safety precautions)	Est. Time Req (min)	Min. Skill Lev	Thresholds		
					Run Hours	Pieces Fed (000)	Freq
		18. Return to service. Restore power to machine as prescribed by the local lockout procedure. Observe the AFSM100 Status Screen on the MIS computer for the following: Machine Status=System Ready, NDSS-Available, USVPC-Connected, REC VCS-Connected, Site VCS-Connected, OCR/BCR1-Connected With VCS, OCR/BCR2-Connected With VCS, OCR/BCR3-Connected With VCS, Printer-On-Line, Right and Left Label Printer-Ready. Notify supervisor of any problems. 19. Position carousel. Run carousel and press E-Stop switch when space from missing bucket assemblies are at the drive module. This will enable an unobstructed view of the drive module Teflon wear strip 20. Perform system shutdown. Shut down system using MS-178 Vol B Shutdown and Lockout Procedures. 21. Lock out power. Power down the machine and lock out electrical power and compressed air as prescribed by the current local lockout instructions providing lockout/restore procedures. 22. Remove the lower drive module guide rail. 23. Replace drive module Teflon chain guide strip. a. Remove carrier brackets to expose the drive module Teflon chain guide strip. b. Replace drive module Teflon chain guide strip PSN 3915-05-000-2312. c. Reinstall all carrier brackets. d. Reinstall lower drive module guide rail. e. Reinstall two end drive module covers. 24. Return to service. Restore power to machine as prescribed by the local lockout procedure. Observe the AFSM100 Status Screen on the MIS computer for the following: Machine Status=System Ready, NDSS-Available, USVPC-Connected, REC VCS-Connected, Site VCS-Connected, OCR/BCR1-Connected With VCS, OCR/BCR2-Connected With VCS, OCR/BCR3-Connected With VCS, Printer-On-Line, Right and Left Label Printer-Ready. Notify supervisor of any problems.					

Part or Component	Item No	Task Statement and Instruction (Comply with all current safety precautions)	Est. Time Req (min)	Min. Skill Lev	Thresholds		
					Run Hours	Pieces Fed (000)	Freq
		25. Position Carousel. Run carousel and press E-Stop switch when space from missing bucket assemblies are along the left side sort modules. This will enable the bucket assemblies to be replaced. 26. Replace 12 consecutive bucket assemblies. Place Drive Motor Lockout switch lever in the OFF position and install lockout device. On the left side of the sort module, install the 12 consecutive bucket assemblies removed in Step 1. Remove lockout device and place Drive Motor Lockout switch lever in the ON position after bucket assemblies have been installed. 27. Check operation. Run the carousel and observe smooth transition of bucket/carrier bracket assemblies as they transition between level change, tension and drive module areas.					
MAIN MACHINE: SORT MODULE	43**	**Observe the sort module alignment.** 1. Start the carousel and observe bucket travel. Buckets should travel smoothly and not bounce. 2. Note bucket number of any individual bucket that does not travel smoothly or bounces. Note module transition locations where bucket bouncing occurs. 3. Notify supervisor of notations.	10	07		39600	
MAIN MACHINE: CARRIER BRACKET AND CHAIN ASSEMBLY	44**	**Observe carrier bracket alignment.** 1. Start the carousel, enter the maintenance alley, and observe the alignment of carrier brackets. All carrier bracket wheels should make contact with the rail. 2. Adjust or replace carrier brackets that are not properly aligned or defective.	6	09		39600	
SORT MODULE: ENTIRE SYSTEM	45**	**Check operation of carousel safety hoods, drive module brake, and torque limiter.** 1. Ensure there is no mail in bucket assemblies. 2. Insert a pliable piece of cardboard in a carrier bucket at chute #30. The cardboard should stick up above the top of the bucket sufficiently to actuate the safety hood at the entry to the drive module.	5	09			M

Part or Component	Item No	Task Statement and Instruction (Comply with all current safety precautions)	Est. Time Req (min)	Min. Skill Lev	Thresholds		
					Run Hours	Pieces Fed (000)	Freq
		3. With safety hood in normal operating position, make two marks on safety hood drawer slide assembly: one mark 8” and another mark 11” from the frame to establish acceptable travel distance limits of the safety hood. 4. Start carousel. When cardboard strikes safety hood, observe that the carousel stops. The cardboard should move the safety hood between 8” and 11”. 5. Insert a pliable piece of cardboard in a carrier bucket at chute #90. 6. Repeat items three and four for the level change module safety hood. 7. If carousel does not stop within prescribed limits, or if excessive backlash is observed, initiate action to check main drive brake and torque-limiter adjustments.					
MAIN MACHINE: ENTIRE SYSTEM	46**	**Check Infeed Station Main Electrical Cabinet and ATHS with thermal imaging device.** 1. Open the infeed station electrical panel doors and the main electrical cabinet door. Scan the following electrical panels for abnormal hot spots and close the panel doors once the scan is completed. 2. Infeed station electrical panels (breaker panel and CCT board panel) for abnormal hot spots. 3. ATD electrical panel (right side). 4. Destacker electrical panel (right side). 5. Lift/Rotate electrical panel (right side). 6. Print/Apply module electrical panel (right side). 7. Each Insert/Extract module electrical panel (right side). 8. Discharge module electrical panel (right side). 9. ATHS Main Electrical Cabinet. 10. AFSM Main Electrical Cabinet panel. 11. Discharge module electrical panel (left side). 12. Each Insert/Extract module electrical panel (left side). 13. Print/Apply module electrical panel (left side). 14. Lift/Rotate electrical panel (left side).	25	09		1540	

Part or Component	Item No	Task Statement and Instruction (Comply with all current safety precautions)	Est. Time Req (min)	Min. Skill Lev	Thresholds		
					Run Hours	Pieces Fed (000)	Freq
		15. Destacker electrical panel (left side). 16. ATD electrical panel (left side). Document all abnormal findings for corrective action.					
ATHS: ATHS PRINT/APPLY MODULE	47	**Check labeler air pressure gauge.** Ensure that the ATHS labeler air pressure is between 45 - 50 PSI, and adjust as necessary. * 1 minute per side.	2*	09		220	
MAIN MACHINE: ENTIRE SYSTEM	48**	**Run Daily Test Deck.** 1. Alternate between the MTSCEVEN and MTSCODD sortplans daily. 2. Set up the AFSM100 to run the daily test deck using the MTSCEVEN or MTSCODD sortplan. Put the machine in BCR/OCR mode. 3. Load each 22 piece grouping on all three infeed stations and start the run. 4. Observe pick-off and vacuum gauge during the destacking of the mail. Open the feeder back door and observe that the vacuum gauge does not fluctuate more than five units as each mailpiece is fed. Verify that the vacuum recovers to high vacuum as each mailpiece is picked off. Close the feeder back door. 5. Perform an End of Run. 6. Collect test deck pieces from mail tubs. 7. Review FICS label placement on template pieces for proper placement and remove FICS labels (approximately 33 labels to be removed). 8. Remove tray labels from mail tubs. 9. Any piece failures should be noted and a work order generated for troubleshooting/corrective maintenance action.	24	09			D
INFEED STATION: FEEDER MODULE	49**	**Run Feeder Performance Test Deck.** 1. Get ready to run the 9-group performance deck by setting up test at MIS computer using sort program MTSCSG. Test each infeed station using performance deck provided with FEDR modification and print report.	75*	09		1540	

Part or Component	Item No	Task Statement and Instruction (Comply with all current safety precautions)	Est. Time Req (min)	Min. Skill Lev	Thresholds		
					Run Hours	Pieces Fed (000)	Freq
		2. Generate a troubleshooting/corrective maintenance work order for stress groups not in tolerance. * 25 minutes per infeed station.					
FINAL-CLEANUP	50**	**Clean up.** 1. Ensure all tools, lubricants, rags, etc., are removed from the work area. 2. Note deficiencies found and repairs performed in the Maintenance logbook. 3. Notify supervisor and/or generate work orders per local SOP to document/initiate corrective maintenance activity for deficiencies found.	5	All			

Tasks marked with one asterisk*, after the time required, are per unit tasks.

Tasks marked with two asterisks**, after the item number, are critical tasks.

ATTACHMENT 4

AFSM100 (NON-ATHS) MASTER CHECKLIST

09-AFSM100-AB-001-M

OPERATIONAL MAINTENANCE

Performed During Operational Tours, Two Tours per Day

Time Total: 29 Minutes Non-ATHS machine

U.S. Postal Service Maintenance Checklist	IDENTIFICATION															
	WORK CODE		EQUIPMENT ACRONYM								CLASS CODE		NUMBER			TYPE
	0	9	A	F	S	M	1	0	0		A	B	0	0	1	M
Equipment Nomenclature: Automated Flat Sorting Machine 100	Equipment Model: AFSM100 (Non-ATHS)										Bulletin Filename: mm20138					Occurrence: eCBM

Part or Component	Item No	Task Statement and Instruction (Comply with all current safety precautions)	Est. Time Req (min)	Min. Skill Lev	Thresholds		
					Run Hours	Pieces Fed (000)	Freq.
SAFETY STATEMENT	1.	**COMPLY WITH ALL SAFETY PRECAUTIONS.** Disconnect power and apply lockouts when required by this instruction. Refer to current local lockout procedures to properly shut down and lock out this machine. Check for suspicious dust or unusual debris. If any unusual substance is found, notify supervisor prior to proceeding with any further action on the equipment. **THE USE OF COMPRESSED OR BLOWN AIR IS PROHIBITED.** When cleaning is required, an alternative cleaning method such as a HEPA filtered vacuum cleaner or a damp rag must be used in place of compressed or blown air. A lint-free cloth or brush may be used on optical equipment only when other cleaning methods cannot be used. Report safety deficiencies to your supervisor immediately upon detection. **WARNING FOR EWP/PPE: Steps contained in this bulletin may require the use of Electrical Work Plan (EWP) Personal Protective Equipment (PPE). Refer to the current EWP MMO or appropriate EWP PPE and barricade requirements.** **WARNING: Various products requiring Safety Data Sheets (SDS) may be utilized during the performance of the procedures in this bulletin. Ensure the current SDS for each product used is on file and available to all employees. When reordering such a product, it is suggested that current SDS be requested. Refer to SDS for appropriate personal protective equipment.**	1	All			
MAIN MACHINE: ENTIRE SYSTEM	2.	**Monitor equipment condition.** **NOTE: Performed during operational tours, two tours per day.** 1. Check maintenance logbook for any outstanding issues.	5	09			T

Part or Component	Item No	Task Statement and Instruction (Comply with all current safety precautions)	Est. Time Req (min)	Min. Skill Lev	Thresholds		
					Run Hours	Pieces Fed (000)	Freq.
		2. Ask operators (feeders and sweepers) and operations supervisor if they are aware of any equipment problems. Investigate reported problems.					
SUPERVISOR STATION: MIS COMPUTER	3.	**Check MIS computer.** **NOTE: Performed during operational tours, two tours per day.** 1. Evaluate MIS computer sort status screen and interim EOR report production totals and rejects to identify abnormal performance such as low read rate, excessive VCS timeouts, excessive jams, low throughput, high occupancy, etc. 2. Check for warnings on AFSM100 diagram and the bottom of the MIS computer screen such as photocell low gain warnings, red or yellow indicators, and low VAC warnings. 3. Observe bucket screen on MIS computer to identify malfunctions and mail stuck in buckets.	5	10			T
INFEED STATION: INFEED STATION	4.	**Check infeed stations.** **NOTE: Performed during operational tours, two tours per day.** 1. Observe warning lamps, warning horns, and startup delay operate properly. 2. Observe feeder module operation for proper paddle motion, belt motion, mail piece presentation, and pickoff. Listen for unusual noise and observe for excessive vibration. 3. Observe mail as it is processed in the destacker. Observe for excessive double feeds. Mail destacking and transport should be smooth and mail should start and stop promptly at each staging point in the mail path. Presser assemblies should not bounce excessively. 4. Observe mail as it is transported through the buffer and accelerator. Mail transport should be smooth and mail should start and stop promptly at each staging point in the mail path. 5. Check for excessive mail under the injectors.	3*	09			T

Part or Component	Item No	Task Statement and Instruction (Comply with all current safety precautions)	Est. Time Req (min)	Min. Skill Lev	Thresholds		
					Run Hours	Pieces Fed (000)	Freq.
		6. Observe buckets through clear Lexan cover near each infeed station injector. Observe that carts transition smoothly out of the injector section, and at infeed station one, for a smooth transition into the tension module. * 1 minute per Infeed					
LEVEL CHANGE MODULE: LEVEL CHANGE MODULE	5.	**Check level change module.** **NOTE: Performed during operational tours, two tours per day.** 1. Label printer label quality check. Randomly select labels from each label printer and observe for acceptable print quality. 2. Observe for proper operation of label cutter and stacker during normal label printer operation. 3. Observe compressed air pressure (level change module). Regulator gauge for incoming air should display 90 ± 5 PSI. Regulator gauge for infeed supply air should display 85 ± 5 PSI.	2	09			T
SORT MODULE: SORT MODULE	6.	**Check sort modules.** **NOTE: Performed during operational tours, two tours per day.** 1. During operational break, use maintenance diagnostic bucket screen to identify and remove mail stuck in and on top of buckets. 2. Observe that warning lamps, warning horns, and startup delay operate properly. 3. Observe that bin indicators and tub present switches function properly. 4. Observe take-away belts on each side of machine for condition and tracking. Listen for unusual noises emanating from take-away belt drive modules. 5. Check general condition of powered roller and skate wheel conveyors at end of machine. 6. Observe bucket assemblies for loose and missing hardware and doors that open prematurely. 7. Randomly select mail from tubs and check FICS label position and clarity of IJP sprayed bar code.	7	09			T

Part or Component	Item No	Task Statement and Instruction (Comply with all current safety precautions)	Est. Time Req (min)	Min. Skill Lev	Thresholds		
					Run Hours	Pieces Fed (000)	Freq.
		8. Check random bin tub labels for clarity.					
DRIVE MODULE: DRIVE MODULE	7.	**Check drive module.** **NOTE: Performed during operational tours, two tours per day.** 1. Observe power factor controller operation. The power factor controller should be set to achieve unity power factor, signified by a display of 0.95 to 1.00 in the display. 2. Observe for excessive voltage fluctuation at the power factor controller panel. 3. Listen for unusual noises emanating from drive module.	1	09			T
MAIN MACHINE: ENTIRE SYSTEM	8.	**Note deficiencies found and repairs performed in the Maintenance logbook.** **NOTE: Performed during operational tours, two tours per day.** 1. Ensure all tools, lubricants, rags, etc., are removed from the work area. 2. Note deficiencies found and repairs performed in the Maintenance logbook. 3. Notify supervisor and/or generate work orders per local SOP to document/initiate corrective maintenance activity for deficiencies found.	5	09			T

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ATTACHMENT 5

AFSM100 (ATHS) MASTER CHECKLIST

09-AFSM100-AC-002-M

OPERATIONAL MAINTENANCE

Performed During Operational Tours, Two Tours per Day

Time Total: 29 Minutes ATHS Machine

U.S. Postal Service Maintenance Checklist	IDENTIFICATION																
	WORK CODE		EQUIPMENT ACRONYM								CLASS CODE		NUMBER			TYPE	
	0	9	A	F	S	M	1	0	0		A	C	0	0	2	M	
Equipment Nomenclature Automated Flat Sorting Machine 100	Equipment Model AFSM100 (ATHS)										Bulletin Filename mm20138					Occurrence eCBM	

Part or Component	Item No	Task Statement and Instruction (Comply with all current safety precautions)	Est. Time Req (min)	Min. Skill Lev	Thresholds		
					Run Hours	Pieces Fed (000)	Freq.
SAFETY STATEMENT	1.	**COMPLY WITH ALL SAFETY PRECAUTIONS.** Disconnect power and apply lockouts when required by this instruction. Refer to current local lockout procedures to properly shut down and lock out this machine. Check for suspicious dust or unusual debris. If any unusual substance is found, notify supervisor prior to proceeding with any further action on the equipment. **THE USE OF COMPRESSED OR BLOWN AIR IS PROHIBITED.** When cleaning is required, an alternative cleaning method such as a HEPA filtered vacuum cleaner or a damp rag must be used in place of compressed or blown air. A lint-free cloth or brush may be used on optical equipment only when other cleaning methods cannot be used. Report safety deficiencies to your supervisor immediately upon detection. **WARNING FOR EWP/PPE: Steps contained in this bulletin may require the use of Electrical Work Plan (EWP) Personal Protective Equipment (PPE). Refer to the current EWP MMO or appropriate EWP PPE and barricade requirements.** **WARNING: Various products requiring Safety Data Sheets (SDS) may be utilized during the performance of the procedures in this bulletin. Ensure the current SDS for each product used is on file and available to all employees. When reordering such a product, it is suggested that current SDS be requested. Refer to SDS for appropriate personal protective equipment.**	1	All			
MAIN MACHINE: ENTIRE SYSTEM	2.	**Monitor equipment condition.** **NOTE: Performed during operational tours, two tours per day.** 1. Check maintenance logbook for any outstanding issues.	5	09			T

Part or Component	Item No	Task Statement and Instruction (Comply with all current safety precautions)	Est. Time Req (min)	Min. Skill Lev	Thresholds		
					Run Hours	Pieces Fed (000)	Freq.
		2. Ask operators (feeders and sweepers) and operations supervisor if they are aware of any equipment problems. Investigate reported problems.					
SUPERVISOR STATION: MIS COMPUTER	3.	**Check MIS computer.** **NOTE: Performed during operational tours, two tours per day.** 1. Evaluate MIS computer sort status screen and interim EOR report production totals and rejects to identify abnormal performance such as low read rate, excessive VCS timeouts, excessive jams, low throughput, high occupancy, etc. 2. Check for warnings on AFSM100 diagram and the bottom of the MIS computer screen such as photocell low gain warnings, red or yellow indicators, and low VAC warnings. 3. Observe bucket screen on MIS computer to identify malfunctions and mail stuck in buckets.	5	10			T
INFEED STATION: INFEED STATION	4.	**Check infeed stations.** **NOTE: Performed during operational tours, two tours per day.** 1. Observe warning lamps, warning horns, and startup delay operate properly. 2. Observe feeder module operation for proper paddle motion, belt motion, mail piece presentation, and pickoff. Listen for unusual noise and observe for excessive vibration. 3. Observe mail as it is processed in the destacker. Observe for excessive double feeds. Mail destacking and transport should be smooth and mail should start and stop promptly at each staging point in the mail path. Presser assemblies should not bounce excessively. 4. Observe mail as it is transported through the buffer and accelerator. Mail transport should be smooth and mail should start and stop promptly at each staging point in the mail path. 5. Check for excessive mail under the injectors.	3*	09			T

Part or Component	Item No	Task Statement and Instruction (Comply with all current safety precautions)	Est. Time Req (min)	Min. Skill Lev	Thresholds		
					Run Hours	Pieces Fed (000)	Freq.
		6. Observe buckets through clear Lexan cover near each infeed station injector. Observe that carts transition smoothly out of the injector section, and at infeed station one, for a smooth transition into the tension module. * 1 minute per Infeed					
SORT MODULE: SORT MODULE	5.	**Check sort modules.** **NOTE: Performed during operational tours, two tours per day.** 1. During operational break, use maintenance diagnostic bucket screen to identify and remove mail stuck in and on top of buckets. 2. Observe that warning lamps, warning horns, and startup delay operate properly. 3. Observe that bin indicators and tub present switches function properly. 4. Check general condition of powered roller and skate wheel conveyors at end of machine. 5. Observe bucket assemblies for loose and missing hardware and doors that open prematurely. 6. Randomly select mail from tubs and check FICS label position and clarity of IJP sprayed bar code. 7. Check random bin tub labels for clarity.	7	09			T
DRIVE MODULE: DRIVE MODULE	6.	**Check drive module.** **NOTE: Performed during operational tours, two tours per day.** 1. Observe power factor controller operation. The power factor controller should be set to achieve unity power factor, signified by a display of 0.95 to 1.00 in the display. 2. Observe for excessive voltage fluctuation at the power factor controller panel. 3. Listen for unusual noises emanating from drive module.	1	09			T
ATHS: ATHS	7.	**Check ATHS.** **NOTE: Performed during operational tours, two tours per day.** 1. Observe general operation of the ATHS system.	2	09			T

Part or Component	Item No	Task Statement and Instruction (Comply with all current safety precautions)	Est. Time Req (min)	Min. Skill Lev	Thresholds		
					Run Hours	Pieces Fed (000)	Freq.
		2. Observe the tracking of all ATHS belts starting at the accumulation module and work around to the discharge module. 3. Observe the ATHS printer apply labels and verify the labels are applied properly.					
MAIN MACHINE: ENTIRE SYSTEM	8.	**Note deficiencies found and repairs performed in the Maintenance logbook.** **NOTE: Performed during operational tours, two tours per day.** Notify supervisor and/or generate work orders per local SOP to document/ initiate corrective maintenance activity for deficiencies found.	5	09			T

Tasks marked with one asterisk*, after the time required, are per unit tasks.

Tasks marked with two asterisks**, after the item number, are critical tasks.

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ATTACHMENT 6

AFSM100 (ATHS AND NON-ATHS) MASTER CHECKLIST

09-AFSM100-**-003-M

** = Class Codes AB AND AC

OPERATIONAL MAINTENANCE

Performed During Operational Tour, 1 Hour Prior To AFSM100 Shutdown for Preventive Maintenance

Time Total: 25 Minutes

U.S. Postal Service Maintenance Checklist	IDENTIFICATION																
	WORK CODE		EQUIPMENT ACRONYM								CLASS CODE		NUMBER			TYPE	
	0	9	A	F	S	M	1	0	0		*	*	0	0	3	M	
Equipment Nomenclature Automated Flat Sorting Machine 100	Equipment Model AFSM100 (ATHS and Non-ATHS)										Bulletin Filename mm20138					Occurrence eCBM	

Part or Component	Item No	Task Statement and Instruction (Comply with all current safety precautions)	Est. Time Req (min)	Min. Skill Lev	Thresholds		
					Run Hours	Pieces Fed (000)	Freq.
SAFETY STATEMENT	1.	**COMPLY WITH ALL SAFETY PRECAUTIONS.** Disconnect power and apply lockouts when required by this instruction. Refer to current local lockout procedures to properly shut down and lock out this machine. Check for suspicious dust or unusual debris. If any unusual substance is found, notify supervisor prior to proceeding with any further action on the equipment. **THE USE OF COMPRESSED OR BLOWN AIR IS PROHIBITED.** When cleaning is required, an alternative cleaning method such as a HEPA filtered vacuum cleaner or a damp rag must be used in place of compressed or blown air. A lint-free cloth or brush may be used on optical equipment only when other cleaning methods cannot be used. Report safety deficiencies to your supervisor immediately upon detection. **WARNING FOR EWP/PPE: Steps contained in this bulletin may require the use of Electrical Work Plan (EWP) Personal Protective Equipment (PPE). Refer to the current EWP MMO or appropriate EWP PPE and barricade requirements.** **WARNING: Various products requiring Safety Data Sheets (SDS) may be utilized during the performance of the procedures in this bulletin. Ensure the current SDS for each product used is on file and available to all employees. When reordering such a product, it is suggested that current SDS be requested. Refer to SDS for appropriate personal protective equipment.**	1	All			
GENERAL		The intent of this checklist is to analyze equipment performance and identify and document corrective actions required during the next PM window to optimize equipment reliability. **WARNING: Be cautious when working around or on equipment when power has been applied.**					

Part or Component	Item No	Task Statement and Instruction (Comply with all current safety precautions)	Est. Time Req (min)	Min. Skill Lev	Thresholds		
					Run Hours	Pieces Fed (000)	Freq.
SUPERVISOR WORK STATION MIS COMPUTER	2.	**Generate and print End of Run and End of Day reports.** Compile and analyze reports. Check for read rates, throughputs, jam rates and locations, reject rates, and maintenance functions.	12	10			D
SUPERVISOR WORK STATION MIS COMPUTER	3.	**Perform trend analysis at the MIS computer.** Perform trend analysis at the MIS computer, using maintenance bus information, to identify signs of degraded equipment performance. Check for and record all real-time errors reported on the AFSM100 graphical display for red or yellow indicators and lower portion of the MIS screen for maintenance log messages indicating error conditions (photocell low gain warnings, etc.). 1. Observe bucket screen on MIS computer. Identify malfunctions and mail stuck in buckets. 2. Check equipment logbook for entries. Investigate problems. Initiate corrective action to address deficiencies in accordance with local SOP.	12	10			D