

Air Midwest Flight 5481, Charlotte, NC Board Meeting

Stephen Carbone

Aircraft Maintenance and Records
Investigator



National Transportation Safety Board

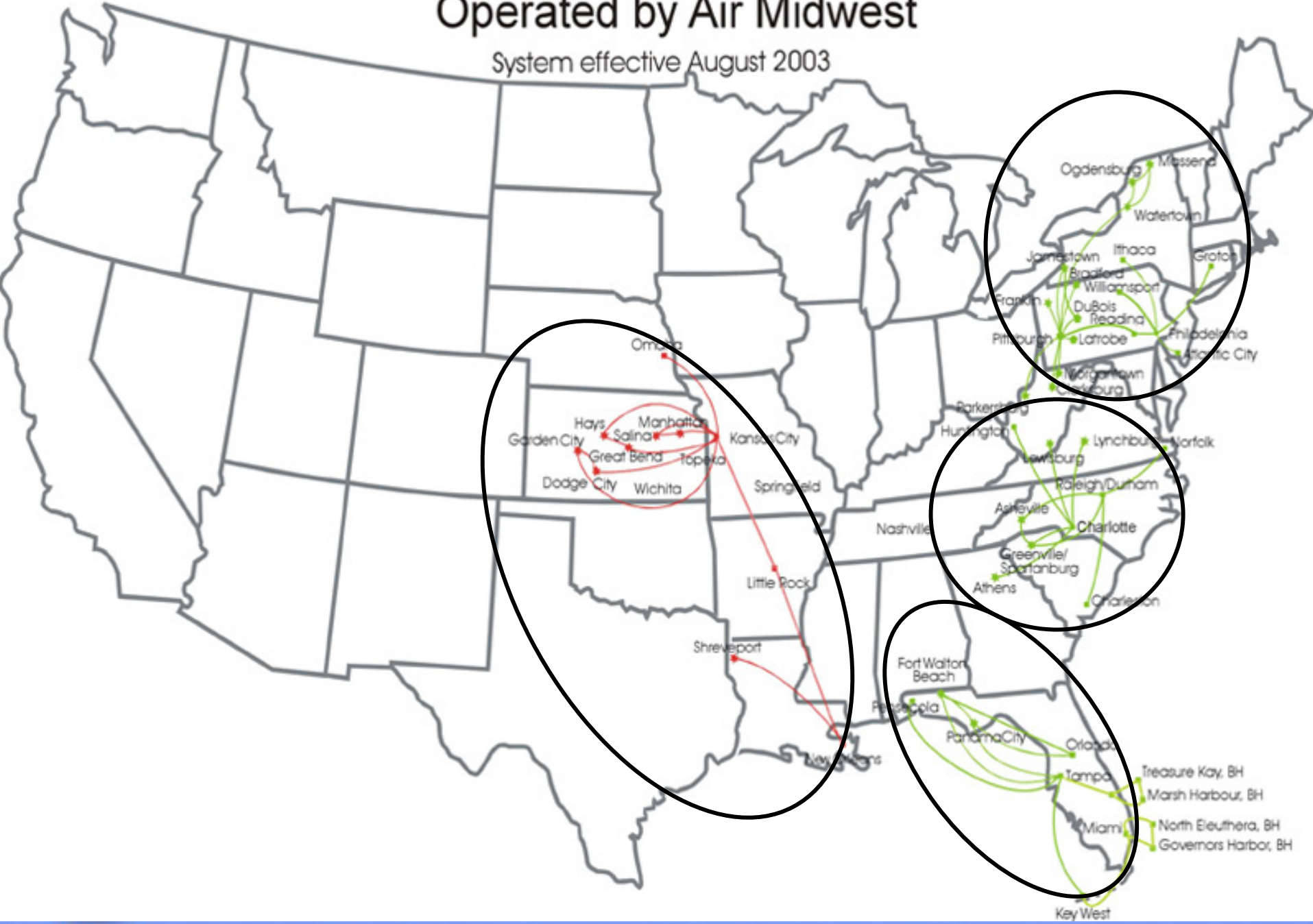
AIR MIDWEST



NTSB Board Meeting Air Midwest Flight 5481

US Airways Express Route Map Operated by Air Midwest

System effective August 2003



The Participants

- **Air Midwest, Inc.**
- **Raytheon Aerospace, LLC**
- **Raytheon Aircraft Company**
- **Structural Modification and Repair Technicians, Inc.**



Huntington, West Virginia Maintenance Facility

- One site manager from Air Midwest
- One site manager from Raytheon Aerospace, LLC
- One foreman from Raytheon Aerospace, LLC
- One quality assurance inspector from Raytheon Aerospace, LLC
- Six aircraft mechanics from SMART, Inc



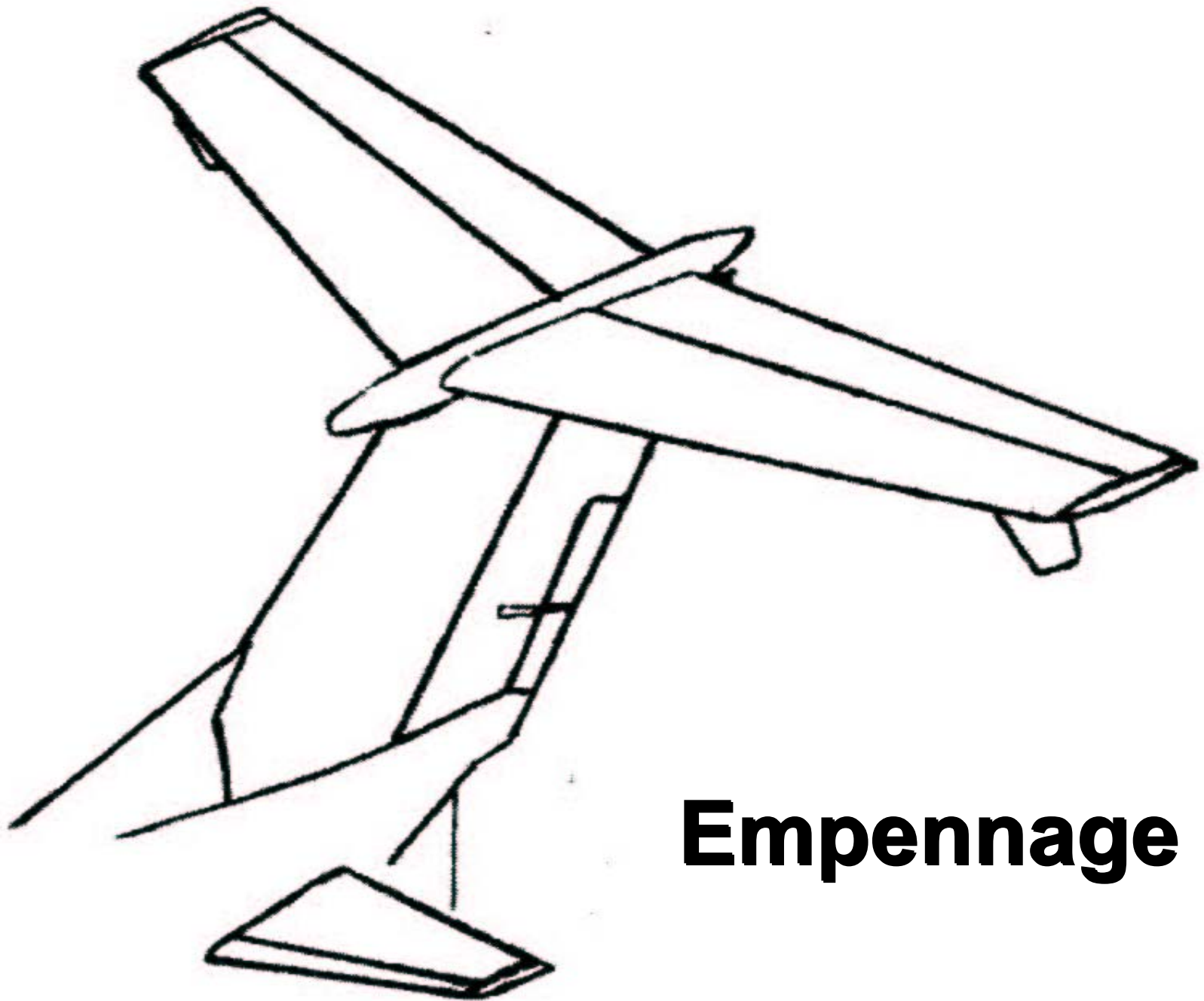
Maintenance Performed



Detail Checks

- Detail one – wings
- Detail two – powerplants
- Detail three – flight compartment/cabin
- Detail four – environmental systems
- Detail five – landing gear
- Detail six – aft fuselage/empennage





Empennage

Detail Six



Work Assignments

January 6, 2003

- Acting foreman – acted as manager and assigned work
- Mechanic one – engines/fuel control change
- Mechanic two – routine inspections/fuel control
- Mechanic three – empennage (elevators)
- Mechanic four – routine inspections/assistance
- Mechanic five – empennage (tabs)
- Quality assurance inspector and training instructor



Foreman's Duties

- Assigns work to mechanics
- Supervises maintenance personnel
- Controls work flow
- Coordinates on-the-job training



Quality Assurance Inspector's Duties

- Ensures work compliance
- Performs required inspections
- Performs nonroutine inspections



Extra Duties Assigned to the Inspector that Night

- Assigned to work OJT with two mechanics
- One of the two mechanics worked the elevator rig



On-site Management on January 6, 2003

Present

- Acting foreman from SMART, Inc.

Not present

- Raytheon Aerospace site manager
- Air Midwest regional site manager



SIXTH DETAILED INSPECTION PROCEDURES CHECKLIST **COPY**

#	ZONE	DESCRIPTION	STAMP	
AFT FUSELAGE AND EMPENNAGE				
	SB2564	.CW BEECH SB 2564 AS REVISED (ACFT.UE1-UE113)	Mech <i>N/A</i>	Insp
1	280 281 311 312 330 340 320	SKIN - Inspect skin for condition and loose or missing rivets. If damage is found, check adjacent structure	Mech AM 714	Insp DI 701
2		STRUCTURE - Check for cracks, loose or missing rivets and concealed damage.	Mech AM 714	Insp DI 701
3	181 311 312	FLIGHT CONTROL COMPONENTS, CABLES AND PULLEYS - Inspect the control system components (pushrods, turnbuckles, end fittings, castings, etc for bulges, splits, bends or cracks.)	Mech AM 704	Insp DI 701
		Check control cables, pulleys and associated equipment for condition, attachment, alignment, clearance, and proper operation.	Mech AM 704	Insp DI 701
		Inspect cables for broken strands or evidence of corrosion per *BE Chapter 20-04-00.	Mech AM 704	Insp DI 701
		Check cable tension per *BE Chapter 27. Temperature <u>55</u> degrees F. 3/16" Elevator Cable Tension: UP <u>57</u> DOWN <u>62</u> 1/16" Elevator Tab Cable Tension: <u>20</u> 3/16" Rudder Cable Tension: LT <u>75</u> RT <u>75</u> 1/16" Rudder Tab Cable Tension: <u>20</u>	Mech AM 704	Insp DI 701
4	311 312	PLUMBING - Inspect plumbing for condition and attachment.	Mech AM 704	Insp DI 701

62
57
119



Check cable tension per *BE Chapter 27.

Temperature 55 degrees F.

3/16" Elevator Cable Tension: UP 57 DOWN 62.

1/16" Elevator Tab Cable Tension: 20.

3/16" Rudder Cable Tension: LT 75 RT 75.

1/16" Rudder Tab Cable Tension: 20.

Mech

AM
704



Check cable tension per *BE Chapter 27.

Temperature 55 degrees F.

3/16" Elevator Cable Tension: UP 57 DOWN 62.

1/16" Elevator Tab Cable Tension: 20.

3/16" Rudder Cable Tension: LT 75 RT 75.

1/16" Rudder Tab Cable Tension: 20.

Mech

AM
704



Adjusting Tension vs Rerigging



r. Continue to balance the adjustment of the two cables until the average tension is 66 ± 8 pounds while maintaining 0° deflection of the elevator.

s. Perform the CONTROL COLUMN SUPPORT ROLLER INSPECTION procedure of this Chapter.

t. Install safety clips on the turnbuckles.

u. On aircraft equipped with the F1000 Flight Data Recorder, calibrate the Pitch Position Potentiometer. Perform the FLIGHT DATA RECORDER (FDR) - PITCH ADJUSTMENT procedure. Refer to Chapter 31-30-00.

v. Remove the travel boards from the horizontal stabilizers.

w. Connect the autopilot servo cables to the elevator primary control cables. Refer to Chapter 22.



Other Investigations



Air Midwest, Inc.

Maintenance Procedures Manual

MANUAL: 240
 REVISION: 1
 DATE: 02/25/02
 PAGE: A.13

Air Midwest, Inc.

ON THE JOB TRAINING/RECORD OF TRAINING

AIRCRAFT TYPE

B1900D

EMPLOYEE

This training record becomes a part of the technician's employment records. The maintenance instructor will date and sign beside each system or item when the technician has completed on-the-job training on that particular system or item. By the technician's signature beside each system or item, he is stating that he has received the training and is competent to work on that system or item. Air Midwest has determined that the items listed in this OJT record of training require recording for training verification purposes. Any items not included in this form will be covered by the mechanic's responsibility for knowledge and proficiency per FAR 43. If the mechanic does not have a level of knowledge and proficiency required to properly complete a task, the mechanic must seek additional training from his supervisor.

Component	System	Mech.	Instructor	Date
ATA 05 00	General & Std Practices			
Inspection Procedures	Instruction	Mech AM 706	Instructor DI 701	Date 12/15/02
Service Inspection				
Inspection Procedures	Instruction	Mech AM 706	Instructor DI 701	Date 12/20/02
Routine Inspection				
Inspection Procedures	Instruction	Mech.	Instructor	Date
Detail #1 Wing Inspection				
Inspection Procedures	Instruction	Mech AM 706	Instructor DI 701	Date 12-11-02
Detail #2 Engine Inspection				
Inspection Procedures	Instruction	Mech.	Instructor	Date
Detail #3 Flt Compartment Insp				
Inspection Procedures	Instruction	Mech.	Instructor	Date
Detail #3 Cabin Compartment Insp				
Inspection Procedures	Instruction	Mech AM 706	Instructor DI 701	Date 12/29/02
Detail #4 Environmental Sys Insp				
Inspection Procedures	Instruction	Mech AM 706	Instructor DI 701	Date 12/08/02
Detail #5 Landing Gear Insp				
Inspection Procedures	Instruction	Mech AM 706	Instructor DI AM	Date 01/08/03
Detail #6 Aft Fuselage/Empenage				
Inspection Procedures	Instruction	Mech.	Instructor	Date
Detail #1-6 Gen. Service Items				

FORM # T005A



NTSB Board Meeting Air Midwest Flight 5481




Service Inspection		(706)	(701)	12/15/02
Inspection Procedures Routine Inspection	Instruction	Mech. AM 706	Instructor DI 701	Date 12/20/02
Inspection Procedures Detail #1 Wing Inspection	Instruction	Mech.	Instructor	Date
Inspection Procedures Detail #2 Engine Inspection	Instruction	Mech. AM 706	Instructor DI 701	Date 12-11-02
Inspection Procedures Detail #3 Flt Compartment Insp	Instruction	Mech.	Instructor	Date
Inspection Procedures Detail #3 Cabin Compartment Insp	Instruction	Mech.	Instructor	Date
Inspection Procedures Detail #4 Environmental Sys Insp	Instruction	Mech. AM 706	Instructor DI 701	Date 12/28/02
Inspection Procedures Detail #5 Landing Gear Insp	Instruction	Mech. AM 706	Instructor DI 701	Date 12/08/02
Inspection Procedures Detail #6 Aft Fuselage/Empenage	Instruction	Mech. AM 706	Instructor DI 31 AM	Date 01/08/03
Inspection Procedures Detail #1-6 Gen. Service Items	Instruction	Mech.	Instructor	Date

ON THE JOB TRAINING RECORD OF TRAINING

AIRCRAFT TYPE

EMPLOYEE

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Component / System	Procedure	Initials/Stamp		
ATA 27-00	FLIGHT CONTROL			
Aileron, Rudder, or Elevator Cable Tension Adjustment	Instruction		Instructor <i>9/05/01</i>	Date <i>1-7-03</i>
Aileron	R & R	Mech.	Instructor	Date
Rudder	R & R	Mech.	Instructor	Date
Flap	R & R			Date <i>11/21/02</i>
Elevator	R & R	Mech.	Instructor	Date

Regulations Pertaining to Maintenance and Inspection

- Title 14 Code of Federal Regulations (CFR) 121.365 (c): “Each person performing required inspections in addition to other maintenance, preventive maintenance, or alterations, shall organize the performance of those functions so as to separate the required inspection functions from the other maintenance, preventive maintenance, and alteration functions.”
- Title 14 CFR 121.371 (c): “No person may perform a required inspection if that person performed the item of work required to be inspected.”



PT/SN>

DATE:

1-06-03

MECH:

ops check ~~NO~~
AM 714

INSP:

DI 701

17 Rudder rig pin installed

Removed Rudder Rig Pin

IAW BMM 27-20-00

RII

PT/SN>

DATE:

1/5/03

MECH:

ops check ~~NO~~
AM 704

INSP:

DI 701

18 Elevator cable tension low

Adjusted elevator cable

Tension per BMM 27-30-02

RII

PT/SN>

~~MS 21256-2~~ (4) MS 21256-2
PL 4
704

DATE:

1/5/03

MECH:

ops check ~~NO~~
AM 704

INSP:

DI 701

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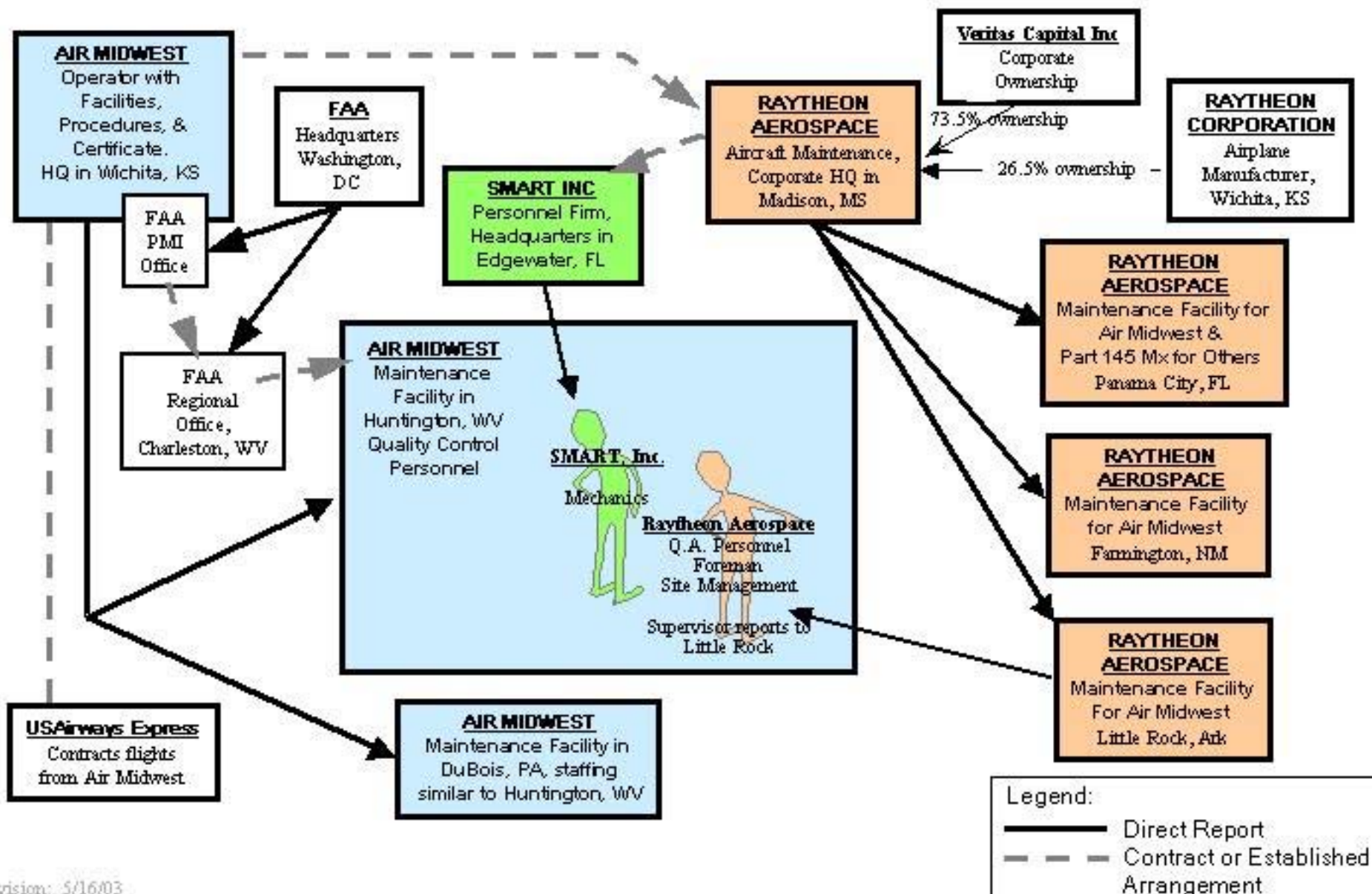
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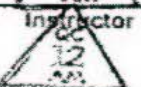

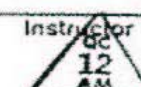

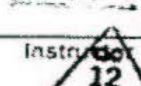
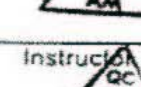

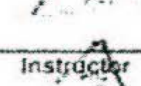
Parties and Personnel Involved in Air Midwest Maintenance



This training record becomes a part of the mechanic/repairman's OJT file. The mechanic/repairman will document any procedure he has not previously performed such as removal and replacement of components, rigging, servicing, etc. The mechanic/repairman and the instructor will initial the mechanic/repairman's OJT form upon successful completion of the OJT for that specific task.

Component / System	Date	Procedure					Initials	
		Clean	Service	Rig	R & R	Operate	Mech.	By
SERVICE INSPECTION	12-27-01		✓				RKT Am 503	QA 53
ROUTINE INSPECTION	12-27-01		✓				RKT Am 503	QA 53
DETAIL #1 INSPECTION	10-22-02 4-20-01		✓				AM 503	AM 7702
DETAIL #2 INSPECTION	1-06-02		✓				RKT Am 503	QA 53
DETAIL #3 INSPECTION	1-06-02		✓				RKT Am 503	QA 53
DETAIL #4 INSPECTION	1-06-02		✓				RKT Am 503	QA 53
DETAIL #5 INSPECTION	1-06-02		✓				RKT Am 503	QA 53
DETAIL #6 INSPECTION	2-12-02		✓				RKT Am 503	QA 53
GENERAL SERVICE ITEMS DETAIL #1 THRU #6	2-12-02		✓				RKT Am 503	QA 53
OPERATIONAL INSPECTION DETAIL 2.4.6			✓					QA 53
LEVELING AND WEIGHING			✓					QA 53

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Component / System	Procedure	Initials/Stamp		Date
ATA 05-00 A/C General & Std Practices				
Inspection Procedures Service Inspection	Instruction	Mech. AM 293	Instructor 	NOV 07 1998
Inspection Procedures Routine Inspection	Instruction	Mech. AM 293	Instructor 	NOV 07 1998
Inspection Procedures Detail #1 Wing Inspection	Instruction	Mech. AM 293	Instructor 	NOV 07 1998
Inspection Procedures Detail #2 Engine Inspection	Instruction	Mech. AM 293	Instructor 	NOV 07 1998
Inspection Procedures Detail #3 Flt Compartment Insp	Instruction	Mech. AM 293	Instructor 	NOV 07 1998
Inspection Procedures Detail #3 Cabin Compartment Insp	Instruction	Mech. AM 293	Instructor 	NOV 07 1998
Inspection Procedures Detail #4 Environmental Sys Insp	Instruction	Mech. AM 293	Instructor 	NOV 07 1998
Inspection Procedures Detail #5 Landing Gear Insp	Instruction	Mech. AM 293	Instructor 	NOV 07 1998
Inspection Procedures Detail #6 Aft Fuselage/Emponage	Instruction	Mech. AM 293	Instructor 	NOV 07 1998
Inspection Procedures Detail #1-6 Gen. Service Items	Instruction	Mech. AM 293	Instructor 	NOV 07 1998