Flight control system oddities, McDonnell Douglas MD-82, April 11, 1998

Micro-summary: This McDonnell Douglas MD-82 experienced a series of unusual flight control system behaviors.

Event Date: 1998-04-11 at 645 EST

Investigative Body: National Transportation Safety Board (NTSB), USA

Investigative Body's Web Site: http://www.ntsb.gov/

Cautions:

1. Accident reports can be and sometimes are revised. Be sure to consult the investigative agency for the latest version before basing anything significant on content (e.g., thesis, research, etc).

2. Readers are advised that each report is a glimpse of events at specific points in time. While broad themes permeate the causal events leading up to crashes, and we can learn from those, the specific regulatory and technological environments can and do change. Your company's flight operations manual is the final authority as to the safe operation of your aircraft!

3. Reports may or may not represent reality. Many many non-scientific factors go into an investigation, including the magnitude of the event, the experience of the investigator, the political climate, relationship with the regulatory authority, technological and recovery capabilities, etc. It is recommended that the reader review all reports analytically. Even a "bad" report can be a very useful launching point for learning.

4. Contact us before reproducing or redistributing a report from this anthology. Individual countries have very differing views on copyright! We can advise you on the steps to follow.

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National Transportation Safety Board		NTSB ID: CHI98IA167 Aircraft Registration Number: N951U												
FACTUAL REPORT		Occurrence Date: 04/11/1998 Most Critical Injury: None							one					
ÄYIATION		Occurrence Type: Incident Investigated By: NTSB												
Location/Time														
Nearest City/Place	State		Zip Code		Local Time		Time Zone							
WASHINGTON	DC		20010		0645		EST							
Airport Proximity: Off Airport/Airstrip	Distar	nce Fron	n Landing Fa	acility:			Direction Fro	m Airpor	t:					
Aircraft Information Summary														
Aircraft Manufacturer			Model	/Serie	S				Type of Aircraft	of Aircraft				
McDonnell Douglas			MD82	2					Airplane					
Sightseeing Flight: No			Air Medio	cal Ti	ansport Flight	: No								
Narrative														
Airlines flight number 235, f a flight control malfunction a no damage to the aircraft and was on an IFR flight plan and v The crew reported that they rudder tab was moving uncom Damper Actuator, Digital Fli further testing. The Yaw Dampe The Dual Axis Accelerometer Honeywell Support Center in using test manual #22-19-01,	5 est rom W fter there isual los mande ght r Act from Dall Rev a me	, N95 Jashin takeo e were mete ed on Guida cuator h the as, 1 at etal s	1U, a Mc gton Nat ff and d no inju orologic autopil the grou nce Com and the aircra Texas fo the avio liver i	Air Medical Transport Flight: No ccident/incident: U, a McDonnell Douglas MD82, being operated as Tra ton National Airport to Saint Louis, Missouri, exp f and diverted to Dulles International Airport. T no injuries to the crew of 5 or 79 passengers. The rological conditions prevailed. autopilot, there were inflight kicks on the rudder he ground. The aircraft was an MD-82, S/N 49245. ce Computer, and Dual Axis Accelerometer were rem and the Digital Flight Guidance Computer passed te aircraft, PN 4034239-901, SN 8303033, was take exas for further investigation. The part was benche he avionics test center. The unit failed an origi iver imbedded in the pins was removed. See attac		puri, experie rport. There gers. The finance ne rudder and N 49245. The were removed passed testin was taken to was bench te an original	enced e was light d the e Yaw d for ng. o the ested test							
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National Transportation Safety Board	NTS	B ID:	CHI98	IA167								
FACTUAL REPORT	Осси	urrenc	e Date:	04/11/1998								
AVIATION	Оссі	urrenc	e Type:	Incident								
Landing Facility/Approach Information												
Airport Name		Airpo	ort ID:	Airport Elevat	tion	Run	way Used	Runwa	ay Lengt	h F	unway Widt	th
				Ft.	. MSL	0						
Runway Surface Type:		L										
Runway Surface Condition:												
Type Instrument Approach: NONE												
VFR Approach/Landing: None												
Aircraft Information												
Aircraft Manufacturer McDonnell Douglas			Model/3 MD82						Serial 4924	Number 5		
Airworthiness Certificate(s): Transport												
Landing Gear Type: Retractable - Tricycle												
Homebuilt Aircraft? No Number of	Seats:	(Certified	d Max Gross W	/t.			LBS	Numbe	er of Eng	nes:	
Engine Type: Unknown		Eng	jine Mar	nufacturer:			Model/Ser	ries:		I	Rated Powe	r:
- Aircraft Inspection Information												
Type of Last Inspection	l	Date	of Last	t Inspection	ו	Гime Sir	nce Last Inspe			Airframe	e Total Time	
Unknown								Ho	ours		Ho	ours
- Emergency Locator Transmitter (ELT) Informa	ation				·							
	Operated?				ELT	Aided ir	n Locating Ac	cident S	Site?			
Owner/Operator Information												
Registered Aircraft Owner		5	Street A		ATUR	AL BR	IDGE ROAD)				
TRANS WORLD AIRLINES		(City							State	Zip Co	
			Street Ad	SAINT LO	0015					MO	63044	
Operator of Aircraft					Reg'	d Aircra	aft Owner					
Same as Reg'd Aircraft Owner		С	City	SAINT LO	ouis					State MO	Zip Co 63044	
Operator Does Business As: TWA						Op	perator Desigr	nator Co	ode: TW	/AA		
- Type of U.S. Certificate(s) Held:												
Air Carrier Operating Certificate(s): Flag Carrie	er/Domestic											
Operating Certificate:				Operator C	Certifica	ate:						
Regulation Flight Conducted Under: Part 121:	: Air Carrier											
Type of Flight Operation Conducted: Schedule	ed; Domestic	; Pas	senger	Only								
	FACT	UAL	REPO	RT - AVIATI	ION						Page	2

Nation	TRANS	Safety Board	1	NTSB II	D: CHI98IA1	67								
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	AVIATI	36			ence Type: In				-					
		Pt		Occurre	nee rype. In	cident								
	ot Information					City					Ctoto	Data of [);eth	A = 0
Name						City					State	Date of E	Sirth	Age
On File	1													
Sex: M	Seat Occupied	: Left		Principal Profe	ession: Civilia	an Pilot				Certif	icate Num	nber: On F	File	
Certificate	(s): Airlir	ne Transpor	ť											
Airplane R	Rating(s):													
Rotorcraft/	/Glider/LTA:													
Instrument	t Rating(s):													
Instructor	Rating(s):													
Type Ratir	ng/Endorsement fo	or Accident/Ir	ncident Ai	rcraft?			C	Current B	iennial Flig	ht Rev	view?			
Medical Ce	ert.: Unknown	Medica	al Cert. St	tatus: Unknov	vn				Date o	of Last	t Medical	Exam:		
- Flight Tir	me Matrix	All A/C	This Make and Model	Airplane Single Engine	Airplane Mult-Engine	Ni	ght	Actual	Instrument Simul	ated	Rotorcraft	GI	ider	Lighter Than Air
Total Time														
	ommand(PIC)													
Instructor	2.46													
Last 90 Da														
Last 24 Ho	-					+								
Seatbelt U	Ised?	Shou	ulder Harn	ness Used?			Toxic	ology Pe	rformed?			Second Pil	ot? Yes	;
							1							
Flight Pla	an/Itinerary													
	ight Plan Filed: IF	R												
Departure	Point						State	e /	Airport Ider	ntifier	Depa	arture Tim	e 1	ime Zone
Same as	Accident/Incide	ent Location									0000	D		
Destination	n						State		Airport Ider	ntifier			I	
SAINT L	OUIS						МО		STL					
Type of Cl	learance: IFR										•			
Type of Ai	rspace: Class	A												
Weather	Information													
Source of	Briefing: Compa	any												
Method of	f Briefing:													
				FACTUA	AL REPORT	- AVI	ATIOI	N						Page 3

FACTUAREPORT Occurrence Date: 04/11/1998 Occurrence Type: Incident Weather Information Time Zone WOF Elevation WOF Distance From Accident Site Direction From Accident Site 0000 0 0 FL MSL 0 FL MSL 0 FL MSL Direction From Accident Site SkyLowest Cloud Condition: Unknown 0 FL AGL Visibility: 0 M Attimeter: ''Hg Temperature: °C Dew Point: °C Wind Direction: Density Altitude: 'Ft. Wind Speed: Guats: Weather Conditions at Accident Site: Visual Conditions Ft. Yisibility: 0 FL Visibility (RVR): 0 FL Visibility (RVV) 0 SM Intensity of Precipitation: Unknown Restrictions to Visibility: 0 FL Altraft Fire: None Altraft Explosion None Classification: U.S. Registered/U.S. Soil Intensity of Precipitation: Unknown Altraft Fire: None Altraft Explosion None Classification: U.S. Registered/U.S. Soil Intensity of Precipitation: U.S. Registered/U.S. Soil Intensity of Precipitation: U.S. Fire Intensity of Precipitating Stadent Piot <th>Nation</th> <th>al Transportation Sa</th> <th>fety Board</th> <th>ΓN</th> <th>rsb ID: (</th> <th>CHI98I</th> <th>A167</th> <th></th> <th></th> <th></th> <th></th> <th></th> <th></th>	Nation	al Transportation Sa	fety Board	ΓN	rsb ID: (CHI98I	A167						
Occurrence Type: Incident Weather Information Time Zone WOF Elevation WOF Distance From Accident Site Direction From Accident Site 0000 0 FL MSL 0 FL 0 NM 0 Deg. Mag. SkyLcowst Cloud Condition: Unknown 0 FL AGL Visibility: 0 SM Attimeter: ''Hg Temperature: °C Dew Point: °C Wind Direction: Density Altitude: Ft. Wind Speed: Gusts: Weather Conditions at Accident Site: Visual Conditions Visibility (RVR): 0 Ft. Visibility (RVR): 0 Ft. Visibility (RVV) 0 SM Intensity of Precipitation: Unknown Type of Precipitation: None Atcraft Environe Atcraft Explosion None Classification: U.S. Registered/U.S. Soil Intensity of Precipitation: Unknown Explosion None E	F	ACTUAL REP	ÖRT	00	ccurrence	e Date:	04/11/1	998		1			
Weather Information WOF ID Observation Time Time Zone WOF Elevation WOF Distance From Accident Site Direction From Accident Site 0000 0 FL MSL 0 NM 0 Deg. Mag. SkylLowest Cloud Condition: Unknown 0 FL AGL Visibility: 0 SM Attimeter: *Hg Temperature: °C Dew Point: °C Work Usibility: 0 SM Attimeter: *Hg Wind Speed: Gusts: Visibility (RVV) 0 SM Intensity of Precipitation: Unknown Ensity Attitude: Ft. Visibility (RVR): 0 FL Visibility (RVV) 0 SM Intensity of Precipitation: Unknown Ensity Conditions Visual Conditions Visibility (RVR): 0 FL Visibility: Intensity of Precipitation: Unknown Ensity Conditions Visual Conditions Accident Information Aircraft Fire: None Aircraft Explosion None Classification: U.S. Registered/U.S. Soil Intensity of TOTAL Firet Pioc I 1 1 1 1 1 1 1 1 </td <td></td> <td>T. The Mar War of a</td> <td>-</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>1</td> <td></td> <td></td> <td></td>		T. The Mar War of a	-							1			
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O Ft. AGL Condition: Unknown Lowest Cloud Condition: Unknown O Ft. AGL Visibility: 0 SM Altimeter: "Hg Lowest Ceiling: Unknown O Ft. AGL Visibility: 0 SM Altimeter: "Hg Temperature: "C Ow Point: "C Wind Direction: Density Altitude: Ft. Wind Speed: Gusts: Weather Conditions at Accident Site: Visual Conditions Visibility (RVR): 0 Ft. Visibility (RVV) 0 SM Intensity of Precipitation: Unknown Accident Information Aircraft Fire: None Aircraft Explosion None Classification: U.S. Registered/U.S. Soil													
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Wind Speed: Gusts: Weather Conditions at Accident Site: Visual Conditions Visibility (RVR): 0 Ft. Visibility (RVV) 0 SM Intensity of Precipitation: Unknown Restrictions to Visibility: - SM Intensity of Precipitation: Unknown Accident Information - - Aircraft Fire: None Aircraft Explosion None Classification: U.S. Registered/U.S. Soil - 1 1 - Injury Summary Matrix Fatal Serious Minor None TOTAL First Plot - 1 1 1 Second Plot - - - - Flight Instructor - - - - Flight Engineer - - - - Check Plot - - - - Flight Engineer - - - - Passengers - - - - Passengers - - - - Other Ground 0 0 0 0	Lowest Ce	eiling: Unknown			0 Ft. /	AGL	Visibi	lity:	0	SM	Alti	meter:	"Hg
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Second PilotImage: Constraint of the second point point of the second point			i atai	Serious	WIITIO	-		10176					
Flight InstructorImage: Check PilotImage: Check PilotImage: Check PilotFlight EngineerImage: Check PilotImage: Check PilotImage: Check PilotCabin AttendantsImage: Check PilotImage: Check PilotImage: Check PilotOther CrewImage: Check PilotImage: Check PilotImage: Check PilotPassengersImage: Check PilotImage: Check PilotImage: Check Pilot- TOTAL ABOARD -Image: Check PilotImage: Check PilotImage: Check PilotOther GroundImage: Omage: Check PilotImage: Check PilotImage: Check PilotImage: Omage: Check PilotImage: Check PilotImage: Check PilotImage: Check PilotImage: Omage: Check PilotImage: Check PilotImage: Check PilotImage: Check PilotImage: Omage: Check PilotImage: Check PilotImage: Check PilotImage: Check PilotImage: Omage: Check PilotImage: Check PilotImage: Check PilotImage: Check PilotImage: Omage: Check PilotImage: Check PilotImage: Check PilotImage: Check PilotImage: Omage: Check PilotImage: Check PilotImage: Check PilotImage: Check PilotImage: Omage: Check PilotImage: Check PilotImage: Check PilotImage: Check PilotImage: Omage: Check P							-	<u>'</u> 1					
Check PilotImage: Check PilotImage: Check PilotImage: Check PilotFlight EngineerImage: Check PilotImage: Check PilotImage: Check PilotCabin AttendantsImage: Check PilotImage: Check PilotImage: Check PilotCabin AttendantsImage: Check PilotImage: Check PilotImage: Check PilotOther CrewImage: Check PilotImage: Check PilotImage: Check PilotPassengersImage: Check PilotImage: Check PilotImage: Check PilotOther GroundImage: Check PilotImage: Check Pilot	Studer	nt Pilot						· ·					
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PassengersImage: Constraint of the second secon	Cabin	Attendants					3	3	1				
- TOTAL ABOARD - Image: Constraint of the second seco	Other (Crew							1				
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- GRAND TOTAL - 0 0 0 84 84	Other (Ground	0	C)	0		0					
	- GRANI	D TOTAL -	0	C)	0	84	84					
				FAC	CTUAL	REPO	RT - AV	IATION					Page 4

National Transportation Safety Board	NTSB ID: CHI98IA167	
FACTUAL REPORT	Occurrence Date: 04/11/1998	
AVIATION ETY BONN	Occurrence Type: Incident	
Administrative Information		
Investigator-In-Charge (IIC) CARL E. DINWIDDIE		
Additional Persons Participating in This Accident/	Incident Investigation:	
RONALD L SCHNEIDER FAA FSDO, 10015 N. EXECUTIVE KANSAS CITY, MO 64153		
MIKE A KREHBIEL TWA, P.O. BOX 20126 KANSAS CITY, MO 64195		
RALPH TAZIOLI HONEYWELL, 3274 DEMOCRAT ROAD MEMPHIS, TN 38118		