

NATIONAL TRANSPORTATION SAFETY BOARD

Office of Aviation Safety
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Attachment 8 –American Airlines Flight Operations Manual

[Excerpts]

OPERATIONAL FACTORS/HUMAN PERFORMANCE

DCA20CA043



Flight Operations Manual

Revision Number: 06 Date: 10 DEC 19

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Free Alcohol

Used only during an extended ground delay (minimum 45 minutes after gate departure) and only after coordination with the FA 1/purser. At some locations such service is against local law. Additionally, the galley may not be stocked to provide such service.

“Ladies and gentlemen, the flight attendants will be circulating through the cabin to offer you your choice of a beverage, compliments of American Airlines. Thank you for your patience.”

Rejected Takeoff, Missed Approach, or Diversion

There is no violation of the sterile period when notifying the cabin crew and the passengers of matters concerning the safe operation of the aircraft. Use the same rule for a missed approach or a diversion. Each of these situations requires the captain reassure the passengers the situation is under control and positive action is being taken to resume normal operations.

Turbulence

See also paragraph [1w.2.3 Communications](#) for turbulence communications.

Expected.

“Ladies and gentlemen, this is Captain _____ speaking. I have instructed the flight attendants to take their seats and fasten their seat belts due to some turbulent air. Please ensure your seat belts are properly fastened. There is no cause for alarm. We simply want you to be aware that there may be a few bumps ahead. We will make every effort to minimize any effects we may encounter. Thank you for your cooperation.”

In Progress or Imminent/No Warning.

“Flight attendants be seated immediately.”

Limited Warning.

“Flight attendants stow the carts and take your seats.”

Suspending Inflight Service.

“Ladies and gentlemen, we are experiencing rough air. The flight attendants are suspending the service and stowing the carts so they can take their seats. This is to prevent injury to our flight attendants and you, and we ask for your patience. Please keep your seat belt fastened and remain seated. When smoother flight conditions return, the service may be resumed.”

Resuming Inflight Service. When conditions permit:

“Ladies and gentlemen please remain seated. Flight attendants may resume your normal inflight duties.”

Suspected EMI

See paragraph [1p.4.2 Suspected Electro-Magnetic Interference \(EMI\)](#) for sample PA.

Requesting a Physician

“Ladies and gentlemen, this is Captain _____ speaking. If there is a physician on board who would like to volunteer their assistance, would he or she please contact a flight attendant. Thank you.”

Off Schedule Arrival

Use discretion when making PA announcements if off schedule arrivals may result in missed connections for passengers. Passenger service personnel will handle these situations. Limit these PAs to informing passengers that passenger service will be available to assist them when they exit the aircraft. Avoid any mention of overnight accommodations or delayed departures on connecting flights.

“Ladies and gentlemen, this is Captain _____ speaking. Passenger service personnel are standing by in the terminal to assist you with connecting flight and gate information. Thank you for your patience and thank you for flying on American Airlines.”

1c.6.3 Seatbelt Sign

Source: 14 CFR Parts 91.517 and 121.317

When not required inflight, extinguish the seatbelt sign to enhance passenger compliance and flight attendant awareness of turbulence. See also [Initial Climb-Out/Cruise PA](#).

Turn on the seatbelt sign:

- prior to aircraft movement on the ground
- during takeoff and landing, initial climb-out, and descent below 18,000 feet MSL
- when the aircraft is:
 - experiencing or is expected to experience moderate or greater turbulence
 - being maneuvered in the vicinity of thunderstorm activity
- at any other times the captain deems to be appropriate

Note: If the seat belt sign is left on for an extended period, occasionally re-emphasize the importance of seat belt use.

See also section [1w.2 Turbulence](#) for flight crew actions.

1w.2 Turbulence

[Light Turbulence Flight Crew Actions](#)

[Moderate Turbulence Flight Crew Actions](#)

[Severe Turbulence Flight Crew Actions](#)

1w.2.1 Operations

Operations through **known** severe or extreme turbulence are not authorized. If informed of the presence of severe or extreme turbulence, avoid the reported area and notify dispatch. If the reported area is:

- in the vicinity of the departure airport: seek a departure routing that avoids the turbulent area or delay departure until conditions improve
- enroute: change altitude/route in order to avoid the reported area
- in the vicinity of the destination airport: seek a descent and approach to avoid the reported area; otherwise, hold until the condition improves or divert

Note: Consider the size of reporting aircraft with PIREPs or ride reports.

Dispatch

Dispatch through **known** turbulence is authorized *if* the forecast indicates the turbulence will decrease to a level less than severe *before* the flight reaches that area. If the dispatcher has planned a route around turbulence for avoidance, it will be noted in the flight plan's RMKS. Consider contacting the dispatcher prior to accepting direct routing from ATC through that area.

Inspection

If *severe* or *extreme* turbulence is encountered, make an AML entry. Maintenance must inspect the aircraft.

1w.2.2 Procedures

Terminal Area Turbulence Considerations

Consider weather impacts in the terminal area that will require flight attendants to remain seated after 10,000 feet AGL on departure or seated earlier during the descent before landing.

Convective Weather. Convective weather is the most common cause of injuries. Look for visual cues or use the radar to scan for hazards in the proximity to the airport. Clues/indications include:

- CB or TCU clouds, lightning, wind shear alerts or precipitation on ATIS information
- gusting or variable direction winds

If able to update the iPad WSI application, look for cloud tops above 20,000 feet and/or an active convective SIGMET warning area near your flight path.

Turbulence Reports. Turbulence reports around the airport offer critical information. Look/listen for PIREPs, TAPs reports, FPG areas, turbulence warning SIGMETs or RPM (model) turbulence on the vertical profile of the WSI application. Query the air traffic controller for information and ride reports. Listen for ride reports from the aircraft ahead on climb out and descent.

Note: If the WSI application shows a white circle around the terminal area, turbulence intensity has exceeded forecast expectations.

Terrain. Some airports, like DEN, with significant terrain features nearby, require special vigilance. When in doubt, assume conditions are turbulent.

Preflight

During the preflight briefing with FA 1/purser, include knowledge of reported or potential turbulence along the route of flight using the terms: *light*, *moderate*, or *severe* turbulence.

Unsafe to Stand During Climb Out. If there are conditions that are unsafe for flight attendants to be standing during climb (see [Terminal Area Turbulence Considerations](#) above), notify flight attendants to remain seated during climb out until the seat belt sign is turned off or until notified by flightdeck it is safe to move about the cabin. Also inform the passengers with an [Expected](#) turbulence PA when

the flight attendants have been asked to remain seated for their safety.

Enroute

Any crewmember can initiate the turbulence procedure communication to discuss the turbulence severity level. See also section [7w.1 Turbulence](#) for flight crew actions.

Arrival. During the arrival review and briefing (prior to BOD when possible), pre-brief flight attendants on the approximate time to have the cabin cleaned up and to be ready to be seated.

Warning: Notify flight attendants with an [In Progress or Imminent/No Warning](#) turbulence PA prior to flying through any conditions that are unsafe for flight attendants to be standing.

Inform the passengers with an [Expected](#) turbulence PA when the flight attendants have been asked to be seated for their safety.

Severity

Turbulence severity can also vary within the aircraft with turbulence intensities typically greater in the rear of the aircraft. Use the procedures associated with the worst level of severity in the aircraft.

Communicate to the FA 1/Purser. When communicating with the flight attendants provide the:

- turbulence severity level that will achieve the desired action by the flight attendants using only the following terms: *light*, *moderate*, or *severe*
- time available until the encounter is expected

Provide the flight attendants as much notification time as possible, keeping in mind normal flight attendant procedures for galley and cabin cleanup may take up to 20 minutes to complete.

- length of time expected to be in the turbulent environment

Emphasize that after the expected time has elapsed, the flight attendants are to remain in their seats until advised by the flightdeck.

Note: Procedures dictate flight attendants remain seated until the flightdeck has provided clear communication that it is safe for them to get out of their seats.

Turbulence

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1w.2.3 Communications

Communications are paramount to the safety of the passengers and flight crew. See also paragraph [Turbulence](#) for PA announcement examples.

Flight Attendants

For:

- *reported* turbulence: notify flight attendants of newly reported or suspected turbulence as soon as possible using the interphone
- turbulence *without notification*: the flight attendants will take their seats and then contact the flightdeck

Passengers

Inform passengers of routine turbulence via PA. When it is necessary for flight attendants to be seated with seat belts fastened, convey this to the passengers.

Dispatch

Report turbulence to dispatch as soon as conditions permit.

Note: The captain's assessment is the final determinant of turbulence levels.

Turbulence Index (TI). The following table describes the flight planning system (FPS) turbulence index scale (found in the flight plan) and the flight planning system response to the turbulence index (TI).

Table 1w.2 Flight Planning System Turbulence Index Scale

Level	TI Scale	FPS Action
NIL/Trace to Light	—	—
Light to Occasional Moderate	3	—
Moderate	4	—
Moderate to Occasional Severe	5	Altitude/speed adjusted
Severe	6	Route blocked
Extreme	7	Route blocked
— End —		

Flight plan TIs are from the Weather Company (TWC) flight planning guidance (FPG) and SIGMET information. Both FPG and SIGMET information can be seen directly in the iPad WSI PilotBrief Optima application.

TIs are located next to each waypoint in the flight plan body and in the wind summary towards the bottom. However, the way the TI values are derived are *differently* between these locations. Taking this difference into account, they should be evaluated together. For:

— wind summary TIs:

These TIs are the actual TI expected at the waypoint location and altitude is based on the time the aircraft is expected to arrive at that point.

Pro: these TIs can help determine expected turbulence at different altitudes along the route.

Con: the downside is that they do not provide any turbulence information between waypoints.

— flight plan body TIs:

These TIs provide an average turbulence expected between the previous waypoint and the waypoint where the TI is displayed based on the time projected in the flight plan. Turbulence is also averaged between altitudes if they differ between the waypoints.

Pro: these TIs give an idea of the average turbulence to expect between waypoints.

Con: the downside is it is an average; so, there may be stronger turbulence along the leg, than what the TI value indicates.

1w.2.4 Terminology

Turbulence vs Chop

Turbulence. Appreciable amounts of pitch, roll or yaw are present.

Chop. Very little to no change in attitude/altitude occurs. Chop is referred to as *light* or *moderate* only.

Note: Chop is not an ICAO term and should not be reported outside the US.

Turbulence Intensity

Smooth. No bumpiness is experienced.

Light Chop. Some slight, rapid, rhythmic bumpiness without appreciable changes in altitude or attitude.

Light Turbulence. Bumpiness accompanied by slight erratic changes in altitude and/or attitude (pitch, roll, yaw). In a condition of light chop or light turbulence, occupants may feel a slight strain against seat belts or shoulder straps. Unsecured objects may move slightly. Food service may be conducted. Little to no difficulty is encountered in walking.

Moderate Chop. Similar to light chop but of greater intensity. There are rapid bumps and jolts without appreciable changes in altitude or attitude.

Moderate Turbulence. Similar to light turbulence but of greater intensity. Altitude and attitude changes occur. Indicated air speed fluctuates. Positive control of the aircraft is maintainable at all times. In a condition of moderate chop or moderate turbulence, occupants feel a definite strain against seat belts or shoulder straps. Unsecured objects move. Food service and walking is difficult. An ACARS or radio report to dispatch is required.

Turbulence

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Severe Turbulence. Large and abrupt changes in altitude and attitude. Indicated air speed fluctuates over a large range. Momentary loss of control may be experienced. Occupants are forced violently against seat belts and shoulder straps. Unsecured objects are tossed about. Food service and walking are not possible. A radio report to ATC and dispatch is required plus AML entry to ensure completion of required maintenance inspection.

Extreme Turbulence. Aircraft is violently tossed about and is practically impossible to control. It may cause structural damage. A radio report to ATC and dispatch is required plus an AML entry to ensure completion of required maintenance inspection.

Turbulence Duration

Term	Chop or turbulence occurs ____ of the reported segment time.
Occasional	less than 1/3
Intermittent	from 1/3 to 2/3
Continuous	more than 2/3

1w.3 Thunderstorms

1w.3.1 Airborne Weather Radar

Weather radar will be on and used when flying in areas of convective activity or forecast convective activity, or when flying at night when there is an expectation of convection buildups.

Note: Airborne radar equipment is an aid to circumnavigate severe weather associated with thunderstorms, rather than a penetration tool.

Radar Failure

If the weather radar fails enroute, the captain must determine whether a thunderstorm area can be circumnavigated safely and with reasonable comfort to passengers. The captain should use available resources to obtain the latest thunderstorm information, as appropriate, from ATC, dispatch, FSS, by reviewing weather reports and SIGMETS, by listening to HIWAS broadcasts, and by using WSI weather maps.

1w.3.2 Recommended Circumnavigation Distances

Table 1w.3 Precipitation and Distances

Type	Distance	Potential Hazards
Stratiform Rain	None specified	Heavy rain, moderate to severe clear ice, poor visibility, reduced braking, and hydroplaning
Convective Shower Round or oval echo shape, steep gradient, radar top below 25,000 feet, isolated cell, and no lightning	Avoid crossing a gradient	Moderate turbulence, occasional severe bumps, strong surface gusts, heavy rain, severe icing, poor visibility, reduced braking, and hydroplaning

Thunderstorms

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Table 1w.3 Precipitation and Distances (Cont'd)

Type	Distance	Potential Hazards
General Thunderstorm Round or oval cell with steep or shallow gradient, radar tops between 25 to 30,000 feet, and lightning	Avoid all detectable precipitation and visible clouds at least 5 nm	Moderate/severe turbulence, lightning strikes, severe icing, gusts to 50 knots, heavy rain in sheets, poor visibility, reduced braking, and hydroplaning
Severe Thunderstorm Any red echo or yellow echo that exhibits one or more of the following features: pendant shape, asymmetrical gradient notches, fingers, hooks, scalloped edges, radar top above 30,000 feet, upwind or new growth at the end of a line/cluster (in the northern hemisphere often the southernmost cell), cell movement above 20 knots, NWS level 3 echo strength or greater, and prominent shadow	Below the freezing level: Avoid all detectable precipitation associated with the cell by at least: • 10 nm in the upwind quadrants • 20 nm in the downwind quadrants Above the freezing level: • Avoid all detectable precipitation associated with the cell by at least 20 nm in all quadrants • Avoid all visible clouds by least 5 nm	Severe and extreme turbulence, large hail, severe icing, tornadoes, lightning strikes, microbursts, gusts in excess of 50 knots, extreme rain, engine flameout, loss of lift, zero visibility, and hydroplaning Note: Even if the base is well defined, hazards often exist to ground level including VMC beneath the base.
— End —		

ATC Filed Flight Plan

1	FF	SCELZPZX	SCEZZQZX	MHCCZQZX	KDENXLDX	KNPAXAAF
2	132202	KTULAALD				
3	^FPL	-AAL912	-IS			
4	-B772	/H	-SDE1E3FGHIJ4J5M1P2RXYZ/B1D1L			
5	-SCEL0004					
6	-N0484F340	DONT1A	DONTI	UT131	ATEDA	UL302 ASEPU/N0483F360
7	-KMIA0752	KFLL				
8	-PBN/A1B1C1D1L101S2T1			NAV/RNVD1E2A1	9	DAT/1FANSP2PDC
10	REG/N771AN	SEL/LPQS				

Figure 2.7 ATC Filed Flight Plan

- 1 **FF**: flight following and **SCELZPZX...KNPAXAAF**: ARTC center addresses
- 2 **132202**: day and time in UTC when flight plan was filed and **KTULAALD**: 8- letter address from which the flight plan was sent
- 3 **^FPL**: international teletype for filed flight plan, **AAL912**: Company and flight number, and **IS**: IFR flight plan
- 4 **-B772**: ICAO 4-character aircraft identifier
/H: wake turbulence indicator: medium (M) or heavy (H) - 300k pounds for US and international
SDE.../B1D1L: radio communication, navigation and approach aid equipment and capability, surveillance equipment, and PER/performance category codes for ICAO fields 10a, 10b, and 18 as follows in the order shown (e.g., SDGIRW)

10a

Table 2.2 Radio Communication, Navigation and Approach Aid Equipment and Capability

N	No capabilities (include no other entries if filed)
S	Standard equipment (VOR, VHF, and ILS)

10b

Table 2.3 Surveillance Equipment Suffix Code

Code	Equipment
N	No capability (include no other entries if filed)
Transponder (file no more than one letter) ¹	
A	Mode A
C	Mode A and C
E	Mode S, ACID, altitude, extended squitter
H	Mode S, ACID, altitude, enhanced surveillance
I	Mode S, ACID, no altitude
L	Mode S, ACID, altitude, enhanced surveillance, extended squitter
P	Mode S, altitude, no ACID
S	Mode S, ACID (aircraft ID), and altitude
X	Mode S, no ACID, no altitude
ADS-B	
B1	1090 MHz out capability, or
B2	1090 MHz out and in capability
U1	UAT out capability, or
U2	UAT out and in capability
V1	VDL Mode 4 out capability, or
V2	VDL Mode 4 out and in capability
ADS-C	
D1	ADS-C FANS-1A, and/or
G1	ADS-C ATN
— End —	

¹ Include items as applicable for transponder, ADS-B and ADS-C. File N only if none of the capabilities are applicable.

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Table 2.4 PER/Performance Category¹ Suffix Code

Code	Equipment
A	Less than 91kts IAS
B	At least 91 and less than 121 kts IAS
C	At least 121 and less than 141 kts IAS
D	At least 141 and less than 166 kts IAS
E	Greater than 166 and less than 211 kts IAS
H	Helicopters
— End —	

¹ Categories based on V_{ref} , if specified, or $1.3 V_{SO}$, each at maximum certificated landing weight per 14 CFR Part 97.3.

- 5 **SCEL0004**: departure station and estimated gate departure time in UTC
- 6 **N0484**: initial cruise speed given in knots (N) followed by 4-figures or as Mach (M) followed by 3-figures (e.g., M082)
F340: cruise altitude expressed as F followed by 3-figures
DONT1A DONTI...UL302: route of flight altitude
ASEPU/N0483F360: speed changes when applicable
- 7 **KMIA**: destination airport, **07521**: estimated time enroute, and
KFLL: alternate(s)

If no alternate(s) are designated, NONE is displayed.

- 8 **PBN/A1B1C1D1L1O1S2T1**: performance based navigation codes as follows:

Table 2.5 PBN/Capabilities Suffix Codes - 8 Maximum (ICAO Field 18)

Code	Equipment	Code	Equipment
Oceanic		RNAV 1 (Enroute/Terminal)	
A1	RNAV 10 (RNP 10)	D1	All

Table 2.5 PBN/Capabilities Suffix Codes - 8 Maximum
(ICAO Field 18) (Cont'd)

L1	RNP 4	D2	GNSS
RNAV 5 (Enroute)		D3	DME/DME
B1	All	D4	DME/DME/IRU
B2	GNSS	RNP 1 (Enroute/Terminal)	
B3	DME/DME	O1	All
B4	VOR/DME	O2	GNSS
B5	INS or IRS	O3	DME/DME
B6	LORANC	O4	DME/DME/IRU
RNAV 2 (Enroute T/Q Routes)		Approach	
C1	All	S1	RNP APCH
C2	GNSS	S2	RNP APCH w BARO VNAV
C3	DME/DME	AR Approach	
C4	DME/DME/IRU	T1	RNP AR APCH w RF
		T2	RNP AR APCH w/o RF
— End —			

9 NAV/RNVD1E2A1 DAT/1FANSP2PDC: other information

Table 2.6 Other Information Suffix Codes - File in Order
(ICAO Field 18)

Code	Equipment	Code	Equipment
STS/	Special handling	EET/	Estimated elapsed time
PBN/	Perf based NAV	SEL/	SELCAL
NAV/	Other NAV capability	TYP/	Non-standard aircraft type
COM/	Other COM capability		
DAT/	Other data application or capabilities	CODE/	24-bit address
		DLE/	Delay (at a fix)

Table 2.6 Other Information Suffix Codes - File in Order
(ICAO Field 18) (Cont'd)

SUR/	Other surveillance capability	OPR/	Operator
		ORGN/	Flight plan originator
DEP/	Non-standard departure station	PER/	Performance category
DEST/	Non-standard destination	ALTN/	Non-standard alternate(s)
DOF/	Date of flight	RALT/	Enroute alternate(s)
RMK/	Remarks	TALT/	Takeoff alternate(s)
REG/	Registration (if not call sign)	RIF/	Route to revised destination
— End —			

10 REG/N771AN: aircraft registration, **SEL/LPQS:** SELCAL and ATN aircraft address for B777-300, B787, A330 *only*

Special Handling Information [Not Shown]: special handling reasons as follows:

Table 2.7 STS/Special Handling Reasons Suffix Codes
(ICAO Field 18)

Suffix Code	Equipment	Suffix Code	Equipment
ALTRV	Altitude reservation	HUM	Humanitarian
ATFMX	Exempt from ATFM	MARSA	Military assumes responsibility for separation
FFR	Fire fighting	MEDEVAC ¹	Life-critical medical flight
FLTCK	Flight check	NONRVSM	Non-RVSM requesting operations in RVSM airspace
HAZMAT	Hazardous materials	SAR	Search and rescue

Table 2.7 STS/Special Handling Reasons Suffix Codes
(ICAO Field 18) (Cont'd)

HEAD	Head of state	STATE	Military, customs, or police
HOSP ²	Medical flight		
— End —			

¹ Operational priority will be given to MEDEVAC flights. See [Medevac Flights](#).

² File HOSP for a medical flight that does not meet the criteria for MEDEVAC. No operational priority is given solely due to filing of HOSP; any priority must be requested.

2.2.4 Body/Driftdown/Re-Dispatch Body

TO	LAT	LONG	MC	MK	GS	TD	SD	ST	SB	
IDENT	FL	WIND	WCP	MH	TRR	TAS	I	TLDR	TTLT	TTLB TH
ESNOX		¹	²	³	⁴	⁵	⁶	⁷	⁸	⁹
		S31433	W071292	343	830	506	P05	0002	0000	0000
¹⁰	¹¹	¹²	¹³	¹⁴	¹⁵	¹⁶	¹⁷	¹⁸	¹⁹	²⁰
ESNOX	34	22027	P022	343	084	484	-	3542	0023	0141 39

Figure 2.8 Flight Plan/Dispatch Release Body

- ¹ **S31433**: latitude coordinate
- ² **W071292**: longitude (LONG) coordinate
- ³ **343**: magnetic course (MC) in degrees
- ⁴ **830**: mach number (MK) in .005
- ⁵ **506**: ground speed (GS) in knots
- ⁶ **P05**: temperature deviation (TD) from ISA plus (P) or minus (M) in degrees
- ⁷ **0002**: segment distance (SD) in nautical miles
- ⁸ **0000**: segment time (ST) in hours and minutes
- ⁹ **0000**: segment burn (SB) in hundreds of pounds

10 **ESNOX**: IDENT field may contain one of the following:

- navigational fix (e.g., ESNOX)
- top of climb
- top of descent
- destination airport

11 **34**: flight level (FL)/altitude

12 **22027**: wind (WIND) direction and speed (e.g., 220° at 27 knots)

13 **P022**: average wind component (WCP) in knots for this segment [plus (P) - tailwind or minus (M) - headwind]

Note: Wind data is updated daily at approximately 0500Z, 1100Z, 1700Z, and 2300Z.

14 **343**: magnetic heading (MH) in degrees

15 **084**: highest actual terrain (TRR) height in hundreds of feet between route waypoints 5 nm left and right of course

16 **484**: true airspeed (TAS) in knots

17 **-**: average turbulence index (I) for this segment (e.g., smooth to light)

Table 2.8 Average Turbulence Index

Dash (-) = Smooth to light	5 = Moderate to occasional severe
3 = Light to occasional moderate	6 = Severe ¹
4 = Moderate	7 = Extreme ¹

¹ Blocks route - no flight plan produced using this route.

The turbulence index values represent the *average* value (i.e., does not include peak values) along the level flight segment and may not adequately represent the turbulence severity during climbs and descents.

Note: Referencing the appended messages section for any given flight/altitude segment *may* provide a more accurate turbulence index for turbulence prediction. See also paragraph 2.3.1 [Enroute Forecasts](#).

Fuel Planning

[Home](#)

— enroute turbulence

This fuel allows the flight crew to search for a smoother altitude, 4,000 feet above or below the flight planned altitude. Use the following table to determine the appropriate amount of ADD fuel if enroute turbulence is known or forecast.

Table 2.12 Enroute Turbulence Fuel (lbs)¹

Fleet(s)	Lbs/Hour	Fleet(s)	Lbs/Hour
A32F, B737, and E190	200	B757	400
B767 and B787	300	A330 and B777	500
— End —			

¹ Plan fuel only for the affected portion of the flight.

— departure delays

This fuel accounts for any anticipated taxi-out delay over and above the planned taxi-out time. Use the following table to determine the appropriate amount of ADD fuel to accommodate the anticipated delay.

Table 2.13 10 Minute Taxi Fuel Burn

Fleet(s)	Lbs/Hour	Fleet(s)	Lbs/Hour
A32F, B737, and E190	300	B767	500
B757	400	A330 and B777	600
B787	450		
— End —			

International. ADD FUEL is also used to meet ETP fuel requirements (see paragraph [ETP Fuel](#)).

ALTN Fuel

Enough fuel to fly and land at the most distant alternate airport (when required). Alternate fuel includes a missed approach at destination, climb to the enroute altitude, long range cruise, descent, instrument approach and landing at the alternate.

Flight Attendants**Home****Security**

Discuss:

- the importance of being notified if a passenger disturbance reaches threat level 1 non-compliant verbal behavior or above
- flightdeck access procedures and codes
- notifying the entire crew of a change to standard security procedures or if there is a specific threat against the flight
- the possible use of turning the cabin lights to full bright, if appropriate, when a security threat above level 1 is observed or suspected

Turbulence

Discuss:

- the weather and turbulence forecast along the route of flight and the expected intensity and duration of forecast turbulence
- service *may* be suspended at flight attendant discretion if the cabin conditions warrant
- the notification procedures and required action in the event of a significant unexpected turbulence encountered
- if possible, a call should be made to the flightdeck to report the cabin situation, including any injuries
- if not seated at a jumpseat with an interphone, remain seated to avoid injury until instructed to resume duties by the captain
- once cleared to resume duties, call the flightdeck to report any injuries or abnormalities

International

Discuss:

- Gen Decs/Customs Immigration forms (if required)
- on North Atlantic flights routed north of 66° north over Greenland, request the FA 1/purser review the FA Safety Manual information concerning 66N Supplemental O2 Unit

Turbulence

Turbulence index values input by WSI are indicated in the same manner.

Flight Plan Weather Briefing Message

The weather briefing message is automatically generated when the pilot requests the flight plan. It contains the following information for departure, destination, alternate airports, and enroute information along the planned route of flight:

- surface weather observations and forecasts
- SIGMECs and SIGMETs
- NOTAMs
- PIREPs
- station field condition reports
- station de-icing status reports

3w.1.3 Sabre Weather Entry Codes

Refer to [Chapter 31: Sabre/DECS](#) for the following weather products:

- SIGMET s (WX significant to the operation of all aircraft in a wide area.)
- AIRMETs (issued for 8 major airport areas for moderate icing, turbulence, sustained winds >30 knots, widespread area of low ceilings widespread mountain obscuration)
- severe weather watches
- hurricane advisories
- winds and temperature aloft (FD) forecasts
- weather radar reports
- volcanic ash messages
- pilot reports

3w.1.4 WSI Pilotbrief

WSI Pilotbrief is available via the Company-approved application or online via AAPilots > AA Flight Resources > Links > WSI Pilotbrief Optima. A user guide is available through both locations.

6c.3 Flight Attendants

6c.3.1 End of Sterile Flightdeck Chime

At 10,000 feet AFL, notify the flight attendants via a chime that it is the end of the sterile flightdeck period and it is safe for the FAs to begin in flight duties *unless* previously notified to remain seated (i.e., for turbulence).

6c.4 Passengers

6c.4.1 Routine PAs

Initial Climb-Out/Cruise PA

Source: 14 CFR Parts 91.517 and 121.317

The following announcement must be made after each takeoff, *immediately* before or after turning the seat belt sign off:

“Ladies and Gentlemen, this is Captain _____ speaking. Now that we have leveled off at our cruising altitude and are forecast to have a smooth flight, I am going to turn off the fasten seat belt sign. However, you should keep your seat belt fastened at all times while seated. Even though the seat belt sign is off, I must caution you that turbulent air can occur at any time. When out of your seat, please be aware that our advance notice of any turbulence may be very limited. So, if I turn the seat belt sign back on, please return to your seats immediately and fasten your seat belt. We authorize our flight attendants to suspend service at any time if they feel it is necessary for their safety and yours. Your safety and comfort are of the utmost importance to all of us at American. Thank you for your cooperation.”

See also paragraph [1c.6.3 Seatbelt Sign](#).

Failure of One Primary Altimeter. Failure of one primary altimeter system does not require exiting RVSM airspace **if** previously recorded cross check with standby altimeter using difference between primary and standby altimeters was accomplished.

Note: Notify ATC of operation with *single* primary altimeter.

Severe Turbulence

In the event of greater than moderate turbulence, or if unable to maintain within approximately 200 feet of assigned altitude due to turbulence, contact ATC and state “Unable RVSM due turbulence.” Request FL change or re-route as necessary. If in radar contact, ATC will provide vectors to avoid traffic at adjacent flight level.

Mountain Wave Activity (MWA)

Contact ATC and report MWA. Request FL change or re-route as necessary. If in radar contact, ATC will provide vectors to avoid traffic at adjacent flight level. In areas without ATC radar, ATC may suspend RVSM and provide 2000 feet vertical separation. If unable to maintain within approximately 200 feet of assigned altitude, state “Unable RVSM due mountain wave activity.”

Wake Turbulence Encounter

There have been isolated reports of wake turbulence encounters in RVSM airspace. Experience has shown that such encounters in RVSM airspace are moderate or less in magnitude. Be alert for wake turbulence when operating approximately 12-15 miles behind same direction traffic that is 1000 feet above.

While:

- in radar contact, if encountering or anticipating wake turbulence in RVSM airspace request: a vector, a flight level change, or an offset
- not in radar contact: refer to the wake turbulence procedure for the geographic region

7w.1 Turbulence

7w.1.1 Light Turbulence

Definition: Turbulence that momentarily causes:

- momentarily slight, erratic changes in altitude or attitude (pitch, roll, yaw)
- slight, rapid, and somewhat rhythmic bumpiness without appreciable altitude/attitude changes (i.e., light chop)

See also paragraph [1w.2.4 Terminology](#).

Inside Cabin Reaction:

- occupants may feel a slight strain against seat belts
- liquids are shaking but not splashing out of cup
- little or no difficulty encountered in walking

Table 7w.1 Light Turbulence Flight Crew Actions

Flightdeck	Flight Attendant
Turn the seat belt sign on at captain's discretion.	— Make seat belt sign on announcement if necessary. — Continue service with caution.
Notify FA 1/purser "Light turbulence procedures are in effect." Include expected duration if known.	If the seat belt sign is on
Provide ATC a PIREP (light turbulence or light chop as applicable).	— Discontinue service of hot liquids and remove hot liquids from carts. — Verify: • passenger seat belts are fastened and infants/children are secured in seats • lavatories are unoccupied
— End —	

Turbulence

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7w.1.2 Moderate Turbulence

Definition: Turbulence that is similar to:

- *light* turbulence but of greater intensity with altitude/attitude/airspeed changes but the aircraft remains in positive control at all times
- *light chop* but of greater intensity without appreciable altitude/attitude changes but rapid bumps or jolts occur

See also paragraph [1w.2.4 Terminology](#).

Inside Cabin Reaction:

- occupants feel definite strains against seat belts
- liquids are splashing out of cups
- difficulty encountered in walking

Table 7w.2 Moderate Turbulence Flight Crew Actions

Flightdeck	Flight Attendant
— Turn seat belt sign on. — Make PA instructing passengers and flight attendants to be seated.	— Make seat belt sign on announcement if necessary. — Discontinue service and seal hot liquids. — Stow and secure galley equipment and carts. — Sit down and secure seat belt.
Notify FA 1/purser “Moderate turbulence procedures are in effect.” Include expected duration if known.	
— Provide ATC a PIREP (moderate turbulence or chop as applicable). — Notify Dispatch.	
When service may be resumed	
— Notify FA 1/purser service may be resumed. — Extinguish the seat belt sign at the captain’s discretion.	— Check passengers/crew needing attention or assistance. — Notify captain of any injuries or interior cabin damage.
— End —	

Turbulence

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7w.1.3 Severe Turbulence

Definition: Turbulence:

- that causes large and abrupt altitude/attitude/airspeed changes occur and the aircraft may be momentarily out of control
- in which the aircraft is violently tossed about and is practically impossible to control and possible structural damage

See also paragraph [1w.2.4 Terminology](#).

Inside Cabin Reaction:

- occupants forced violently against their seat belts
- items falling or lifting off surfaces
- walking is impossible

Table 7w.3 Severe Turbulence Flight Crew Actions

Flightdeck	Flight Attendant
— Turn seat belt sign on. — Make PA instructing passengers and flight attendants to be seated <i>immediately</i>.	— Make seat belt sign on announcement if necessary. — Discontinue service and seal hot liquids.
Notify FA 1/purser “Severe turbulence procedures are in effect.” Include expected duration if known.	— Stow and secure galley equipment and carts. — Sit down and secure seat belt.
— Provide ATC a PIREP (severe or extreme turbulence as applicable). — Notify Dispatch.	Note: FA 1/purser will notify flightdeck crew when all flight attendants are seated.
When service may be resumed	
— Notify FA 1/purser service may be resumed. — Extinguish the seat belt sign at the captain’s discretion. — Make AML severe turbulence entry.	— Check passengers/crew needing attention or assistance. — Notify captain of any injuries or interior cabin damage.
— End —	

7w.1.4 Mountain Wave

Mountain waves develop on the lee, or downwind, side of mountains. These waves are generated when strong winds flow in a generally perpendicular fashion up and over mountain ranges with strong inversions or a stable air barrier. They may extend for hundreds of miles.

Forecast mountain waves are included in the Flight Planning Guidance Charts available in WSI Pilotbrief Optima, as well as SIGMETs that are either noted in flight plans or relayed by dispatch, as appropriate. Satellite imagery (wave appearance) is a great tool to identify both the location and severity of a mountain wave and is a selectable overlay layer in PilotBrief.

If possible, laterally detour the area where the mountain wave conditions exist. If this is not possible, use an altitude which is at least 3,000 to 5,000 feet higher than the height of the mountain wave, if known.

When mountain wave turbulence is suspected:

- fly the aircraft at the turbulent air penetration speed
- avoid the area around and directly beneath rotor clouds
- be alert to turbulence when lenticular clouds are present

Strong winds over or around mountainous terrain can cause the altimeter to indicate an altitude higher than the actual altitude. For this reason, allow a generous margin of altitude, not only for possible altimeter error, but also for possible downdrafts that might be associated with high winds.

Flight conditions at the tropopause level may be turbulent; therefore, fly the aircraft well above the tropopause in the area of the stratosphere, or at an altitude well below the tropopause level. Mountain wave turbulence may be encountered with the highest exposure more likely in the vicinity of the tropopause.

Turbulence**Home**

When mountain wave conditions are imminent, important operational considerations include:

- believe the SIGMET

A lack of current reports in a Mountain Wave SIGMET area may not be indicative that the wave has diminished or that the SIGMET should be removed. The variability in mountain wave PIREPs and/or a lack of reports from ATC may not mean that all is clear.

- turn on the seat belt sign prior to entering forecast or reported mountain wave areas
- discuss with the cabin crew anticipated forecast mountain wave conditions during the Flight Attendant/Purser Briefing so that cabin service adjustments can be considered
- report mountain wave conditions to ATC and dispatch

This is important data for the TWC meteorologists to not only validate mountain wave conditions, but refine SIGMET areas for future flights.

7w.2 Thunderstorm

7w.2.1 Detection and Avoidance

Detection

Early initiation of thunderstorm detours is considered good operating practice. Plan an avoidance path as soon as possible for weather echoes which appear beyond 100 miles since this indicates they are significant storms.

Some ATC radar cannot differentiate between areas of heavy precipitation and severe storms, therefore sometimes controllers can only advise pilots of precipitation areas, but cannot determine the intensity of the precipitation or ensure clearance from severe weather.

Avoidance

Thunderstorm tops should be cleared by at least 5000 feet. Use extreme caution in overflying a short but building storm, especially one with a domed top; it could grow at over 6000 feet per minute, and have severe turbulence well above it. The echo of a building storm is characterized by hard, crisp edges. Dissipating storm echoes have an indistinct appearance along the outer periphery, but may still be extremely hazardous. If clearing storm tops will require less than 5000 feet separation, use circumnavigation distances, upwind deviations normally being more desirable.

The key to avoiding detected weather is to first determine the heading change needed to bypass a storm safely.

Monitoring of weather should be done at the longer ranges, whenever possible, to allow time to assess weather development and plan any heading changes. When using shorter ranges, occasionally monitor a longer range to determine the extent of the weather activity.

Turbulence can be assumed to be present above any storm with severe turbulence at the storm center. Never attempt to penetrate or fly over a storm cell; rather, plan ahead to establish a flight path that avoids storm cells by at least 20 miles. It is usually best to avoid thunderstorms on the upwind side. If not possible, a good rule of thumb is use your current altitude wind velocity and fly downwind using that number in nautical miles from the edge of the thunderstorm activity.

Thunderstorm**Home**

- Assume all weather with a radar top above 15,000 feet may be hazardous.
- Assume all weather with a radar top above 20,000 feet is hazardous.
- Assume all weather with a radar top above 30,000 feet is very hazardous.

Do not assume ATC will warn you of hazardous weather.

Do not assume you will receive a PIREP, even when the weather is extreme.

24.1 TAF/METAR Weather Reports

24.1.1 WSI

WSI provides the Company with weather information. Flight crews have access to weather information through the WSI iPad application, in addition to displaying weather in Sabre/DECS by using the command SLS* followed by the station and various 2-3 letter codes for which weather report is requested (e.g., SLS*sta/TAF).

24.1.2 US Aerodrome Forecast (TAF)

Terminal aerodrome forecast (TAF) is a report established for the 5 statute mile radius around an airport.

Validity/Update

Each TAF is valid for a 24-hour time period and is updated four times a day at 0000Z, 0600Z, 1200Z, and 1800Z.

```
TAF
KORD 091730Z 091818 15005KT 5SM HZ FEW020 WS010/31022KT
FM1930 30015G25KT 3SM SHRA OVC015 TEMPO 2022 1/2SM +TSRA
OVC008CB
FM0100 27008KT 5SM SHRA BKN020 OVC040 PROB40 0407 00000KT 1SM
-RB BR
FM1015 18005KT 6SM -SHRA OVC020 BECMG 1315 20010KT P6SM NSW
SKC
```

Figure 24.1 TAF Example

The following surface observations are not authorized for use as a source of weather:

- any weather observation that does not include the visibility, altimeter setting, or ceiling, if it is required for weather minimums in that country
- weather observations accomplished by any of the following types of systems unless they have been supplemented by a manual observation containing at least the visibility, altimeter setting, and ceiling, if required for weather minimums in that country:
 - AWOS-A
 - AWOS-1
 - AWOS-2
 - AMOS
 - AUTOB stations

24.1.7 Enroute Weather Information

The following sources of weather information may be used enroute:

National Weather Service Radar Network (NEXRAD). NEXRAD displays are available via WSI, in FSS, and, in the future, at enroute ATC facilities.

Hazardous Inflight Weather Advisory Service (HIWAS). HIWAS is a continuous broadcast of current SIGMETs, CONVECTIVE SIGMETs and PIREPS over the VOR frequency for that geographic area. Indicated by “HIWAS” printed above VOR frequency box.

Center Weather Advisory (CWA). The CWA is an unscheduled weather advisory issued by the National Weather Service ATC Center unit. It reflects current conditions that may impact flight crews and ATC. It may be issued as a supplement to an existing SIGMET, CONVECTIVE SIGMET or area forecast or when conditions are observed that may lead to the issuance of a SIGMET, CONVECTIVE SIGMET or amendment to an area forecast.

24.2 Sabre/DECS Commands

Sabre/DECS commands are used to pull several types of weather reports. Use the appropriate commands listed in these sections to pull the desired report.

See also [Table 31.7 Frequently Used Command Code Elements](#).

24.2.1 SIGMEC

SIGMEC stands for significant meteorology Company-produced.

SLA*<Sta>/AS – terminal (25 mile radius)

SLA*TS/ALL – thunderstorms

SLA*IC/ALL – enroute icing

SLA*VA/ALL – volcanic ash

SLA*CA/ALL – clear air turbulence

24.2.2 SIGMET/AIRMET

SIGMET stands for significant meteorology concerning severe and extreme conditions of importance to all aircraft. AIRMET stands for airman's meteorology concerning less severe conditions which may be hazardous to light aircraft. The FAA broadcasts both of these on navaid voice channels HIWAS.

Area Forecast (FA)

This information provides 12-hour aviation forecasts plus a 6-hour categorical outlook prepared three times a day giving general cloud cover, weather, and frontal conditions descriptions for an area the size of several states. Each SIGMET or AIRMET affecting an area forecast also amends the FA. Area forecasts reference:

- cloud top and icing heights use above sea level (ASL)
- ceiling heights use above ground level (AGL)
- cloud layer bases use ASL unless otherwise indicated

Area Forecast Issuing Stations. The following stations issue area forecasts: BOS, CHI, DFW, MIA, SLC, SFO, HNL, ANC, FAI, and JNU.

SLS*<Sta>/ALL – station data

SLS*<Sta>/AFC – area forecast with SIGMET clouds and weather

SLS*<Sta>/AFH – area forecast with hazards

SIGMET and CWA

An in flight center weather advisory (CWA) and/or SIGMET warn of potentially hazardous weather such as squall lines, thunderstorms, fog, icing, and turbulence.

SIGMET/CWA/AIRMET Issuing Stations. The following stations issue these advisories: BOS, CHI, DFW, MIA, SLC, SFO, HNL, ANC, FAI, and JNU.

SLS*<Sta>/WS – SIGMETs

SLS*<Sta>/WA – AIRMETs

National Weather Services System (NWSS). Messages are issued for convective SIGMETs. The messages are divided into three regions; MK1 east coast states, MK2 central states, and MK3 west coast states.

SLS*MK<#>/WS1 - *latest* convective SIGMET data received

SLS*MK<#>/WS2 - *previous* convective SIGMET data received

SLS*MK<#>/WS3 - *next* previous convective SIGMET data received

24.2.3 Weather Radar Reports

This information is issued by radar stations at 35 minutes past the hour, with special reports issued as needed. These provide information on the type, intensity, and location of the echo top of the precipitation.

SLS*<Sta>/SD

Weather Radar Reports Examples

MAF 2225 LN 7TRWX/NC 35/220 237/150 16W L3110 C2120 MT 450 AT 316/45

Figure 24.3 Weather Radar Example 1

Weather radar observation for Midland, TX completed at 2225Z. Broken line (7/10s) of intense thunderstorms with no change in intensity in the last hour, extending from (bearings are true, relative to MAF) 035° at 220 nm to 237° at 150 nm, 16 nm wide. Line is moving from 310° at 10 knots with individual cells moving from 210° at 20 knots. Maximum top in the line is 45,000 feet located at 316° at 45 nm.

TROP 513 AREA 2TRWX/PLUS 45/110 241/155 110W C2120 MT 400 AT 261/105

Figure 24.4 Weather Radar Example 2

Tropopause is at 51,300 ft. Also a 2/10s coverage of intense thunderstorms, increasing in intensity, in an area from 045° at 110 nm to 241° at 155 nm, 110 nm wide. Individual cell movement is from 210° at 20 knots. Maximum top in the area is 40,000 feet located 261° at 105 nm.

24.2.4 Wind and Temperature Aloft (FD) Forecasts

These are 12-hour forecasts of wind direction (nearest 10° true N) and speed (knots) for selected flight levels. Temperatures aloft (°C) are included for all but the 3000 foot level.

SLS*<Sta>/FD

```
SLS* JFK/FD
JFK KJFK 221924
3000 6000 9000 12000 18000 24000 30000 34000 39000
USEABLE 221400-222100
221404
2709 3014P20 3124P14 3022P09 2824M04 2928M15 302731 312840 282451
USEABLE 222100-230600
221404
3409 2818P21 2913P25 3112P09 2814M05 2731M15 283130 282240 301552
```

Figure 24.5 Wind/Temperature Aloft Example

Between 1400-2100Z at 6000 feet MSL over JFK wind from 300° at 14 knots and temperature plus 20° C.

24.2.5 Volcanic Ash Messages

Volcanic ash advisories are issued by the appropriate government watch office.

SLS*VAC/VA1 - the *latest* volcanic ash advisory received

SLS*VAC/VA2 - the *previous* volcanic ash advisory received

SLS*VAC/VA3 - the *next* previous volcanic ash advisory received

24.2.6 Pilot Reports

Up to 3 pilot reports can be stored in DECS.

SLS*<Sta>/UA1 - the *latest* pilot report filed

SLS*<Sta>/UA2 - the *previous* pilot report filed

SLS*<Sta>/UA3 - the *next* previous pilot report filed

UA/OV SEA160010/TM 0951/FL100/TP 734/SK OVC/TB NEG/IC LGT RIME/WV 040040/RM ICG DURGC 070-100
--

Figure 24.6 PIREP Example

Position is 10 nm 160° from SEA at 0951Z. At 10,000 feet, a B737-400 reported overcast sky, no turbulence, light rime icing, wind of 040° at 40 knots and a remark that icing was encountered during climb from 7000 to 10,000 feet.

24.2.7 Severe Weather Watches

These provide severe thunderstorm watch probabilities and location of boxes by listing the counties in the states affected.

SLS*MKC/WW1 - the *latest* severe weather forecast received

SLS*MKC/WW2 - the *previous* severe weather forecast received

SLS*MKC/WW3 - the *next* previous severe weather forecast received

Hurricane Advisories

Hurricane advisories are issued for 5 regions and include a general synopsis.

SLS*MIA/WH - forecasts for the Atlantic Ocean

SLS*SFO/WH - forecasts for the Pacific Ocean

SLS*SJU/WH - forecasts for the Caribbean Sea

SLS*HNL/WH - forecasts for the Southern Pacific Ocean

SLS*TYO/WH - forecasts for the Sea of Japan and Northern Pacific Ocean

SLS*GTW/WH - hurricane forecasts

24.2.8 Other Entries

Table 24.11 Other DEC Entries

Code	Displays the:
SLS*<Sta>/ALL	TAF, METAR, NOTAMs, Field Report and Deicing Report
SLS*<Sta>/SA/ALL	last 3 surface observations
SLS*<Sta>/DI	deicing report
SLS*<Sta>/FC	field condition report
SLS*<Sta>/NO	NOTAMs
RW*/<Sta>	wind conditions
— End —	

24.3 Significant Terminal Weather Information

24.3.1 Terminal Doppler Weather Radars (TDWRs)

This radar has been commissioned at major US and Caribbean airports to disseminate significant terminal weather to ATC personnel. It is also available to flight crews at selected locations via ACARS and is called terminal weather information for pilots (TWIP).

Table 24.12 TWIP-Equipped Airports

ADW	CLT	DEN	IAD	LGA	MKE	PHL	SJU
ATL	CMH	DFW	IAH	MCI	MSP	PHX	SLC
BNA	CVG	DTW	ICT	MCO	MSY	PIT	STL
BOS	DAL	EWB	IND	MDW	OKC	RDU	TPA
BWI	DAY	FLL	JFK	MEM	ORD	SDF	TUL
CLE	DCA	HOU	LAS	MIA	PBI		
— End —							

24.3.2 TDWR Weather Information

TDWR identifies and provides information on microbursts, windshears, gust fronts, precipitation and storm cells within 15 nm of the airport. Storm locations will be identified for storms within 20 nm. It also has the capability for sending a character graphics map of weather within 15 nm of the airport. Weather information is updated every minute when weather is present within 15 nm of the airport, otherwise, it is updated every 10 minutes.

How to Request Data (As Installed)

B737, B757, and Non-Basic FMC B767 Aircraft. On B737, B757 and B767 aircraft, TWIP may be requested by accessing the TWIP function located in the aircraft ACARS menus. For further information on accessing TWIP on these aircraft, refer to the respective operating manuals.

Basic B767 Aircraft. On Basic FMC B767 aircraft, current TWIP data is transmitted to the aircraft via ACARS. TWIP data will be transmitted every time the flight crew enters an ACARS request for DIGITAL ATIS. This entry will vary by ACARS type as follows. If the ACARS MU has:

- a screen type display: select ATIS REQUEST
- an eight-digit alpha-numeric display: enter MISC 3 followed by the airport city code

Transmission

TWIP data is transmitted to the aircraft via ACARS and is transmitted every time the flight crew enters an ACARS request for DIGITAL ATIS. This entry will vary by ACARS type as follows:

- Boeing and E190 aircraft: select ATIS REQUEST
- Airbus aircraft: request ATC weather

Note: Ensure the correct airport code is displayed for which TWIP data is being requested.

When a crew receives notice of significant weather impacting the arrival/departure, validate the information with the appropriate ATC facility (usually the tower). After information validation, use your windshear training and good judgment.

24.3.3 Terminal Weather Textual Messages

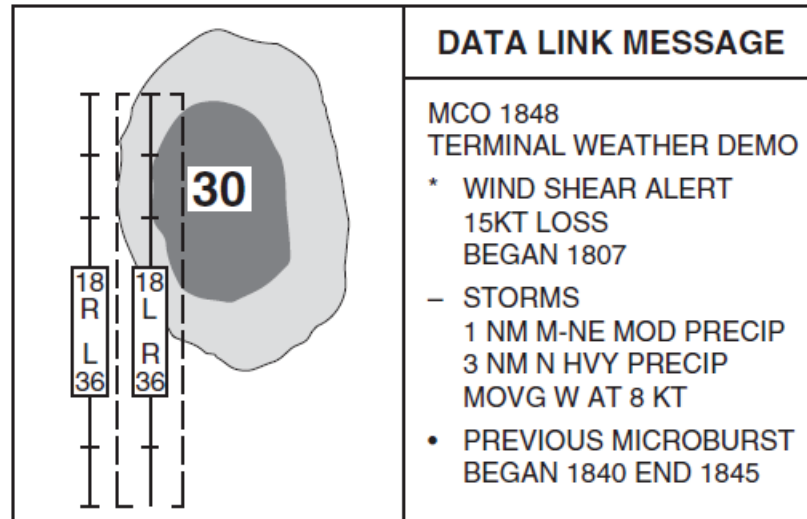


Figure 24.7 Terminal WX Text Message Format

Layout

The message is divided into two header lines plus three blocks.

Note: Not all of the information appears for a given message.

First Header Line. The first header line provides the airport identifier and the current Universal time.

Second Header Line. The second header indicates the message is a Terminal Weather demonstration.

Three Blocks. The three blocks provide present significant weather, a discussion of the terminal weather, and expected or recent significant weather.

Note: If there is no significant weather within a 15 nm radius of the airport, this will be communicated as “NO STORMS WITHIN 15 NM.” in lieu of the three blocks.

Block Content

One. When:

- proceeded by an asterisk (*): shows the CURRENT significant weather impacting the runways and is based on the alerts given by the Doppler radar system

Microburst alerts indicate wind losses greater than 30 knots in the core of the phenomena. However, the actual wind loss on final approach may be less than 30 knots if the core of the microburst is just outside the approach corridor.
- included in this block: the microburst's intensity and the time it began are included

A wind shear alert indicates a 15 to 30 knot loss or a gain greater than 15 knots. It also includes intensity and the time the alert began.
- there is precipitation impacting the approach or departure, but no microburst or wind shear alert, then a precipitation alert is issued as either:
 - moderate (level 2 - yellow on the color radars) or
 - heavy (levels 3 to 6 - red) with the time it began

Two. When preceded by a dash (–): indicates the presence of storm cells in the terminal area (within 15 nm of the airport).

For each storm, there is a distance, direction and intensity reported as one of the following:

- moderate (yellow)
- heavy (red)
- hail (if the presence of hail is infrared from the radar data)

The distance is measured from the storm's edge to the airport reference point.

The general direction and speed of motion are shown in the last line of the second block.

Three. When preceded by a period (.), provides expected precipitation at the airport for the next 15 to 20 minutes. The expected precipitation (moderate or heavy) is provided with the forecasted start time. This block also lists previous microburst or windshear alerts which existed at the airport within the last 5 minutes. If there is no weather resnet within 15 nm, then the message “NO STORMS WITHIN 15 NM.” will be transmitted.

24.3.4 Terminal Weather Character Graphics Map

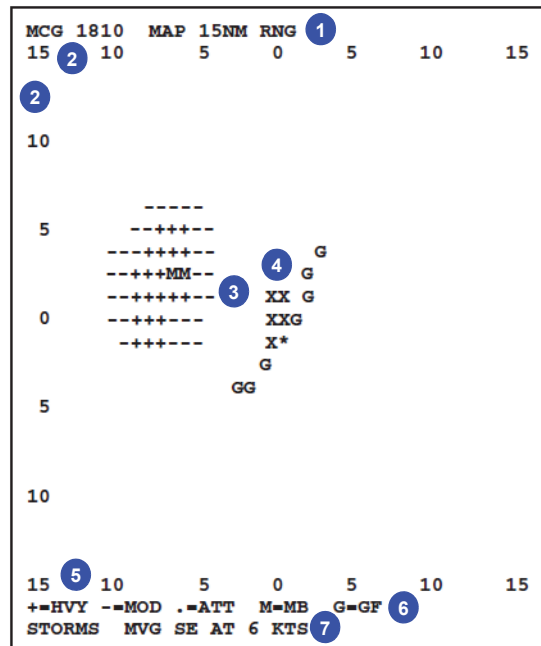


Figure 24.8 TW Character Graphics Map

Note: This graphics map feature is not available on Basic FMC B767 aircraft.