ZFW CWT/ATPA Briefing

Consolidated Wake Turbulence (CWT) and Automated Terminal Proximity Alert (ATPA)

Thank you to Daniel Everman for letting me steal this presentation

Why this briefing?

- The latest CRC update has added CWT classes to aircraft’s data blocks, as well as ATPA processing.
- While previously we relied on older separation minima for wake turbulence (as memorizing aircraft types/classes was considered too burdensome), the new update makes CWT far easier to leverage for the layman VATSIM controller.

Why CWT?

- Previously, wake separation minima was based off of weight categories that came to be considered too broad as more data became available.
  - For example, on approach, a trailing heavy aircraft (under the old wake turbulence system) would require 4 miles of separation from a leading heavy aircraft.
  - An A306 is considered heavy and so is a B744. But, the B744 has an MTOW that's more than twice that of the A306's. Does it really need 4 miles behind the A306?
- So, 9 new classes were created to better capture the variance in wake generated within the previous classes.
  - These new classes also use other factors like wingspan and approach speed, among others, to better categorize aircraft.
  - This will allow us to reduce separation between aircraft where we may have not been able to previously.

CWT Overview

7110.65 Weight Classes	CWT Wake Categories	
Super	A.	Super
Heavy	B.	Upper Heavy
	C.	Lower Heavy
	D.	Non-Pairwise Heavy*
B757	E.	B757
Large	F.	Upper Large
	G.	Lower Large
Small Plus	H.	Upper Small > 15,400 lbs
Small	I.	Lower Small ≤ 15,400 lbs

*Non-Pairwise Heavy a/c lack sufficient performance data to be otherwise categorized.

Common Aircraft/CWT Categories

This table can also be found in FAA JO 7110.126B. A full list of aircraft and their CWT categories can be found in FAA JO 7360.1.

A	B	C	D		E	F		G		H	I
Super	Upper Heavy	Lower Heavy	Non-Pairwise Heavy		B757	Upper Large		Lower Large		Upper Small	Lower Small
A388	A332	A306	A124	E3CF	B752	A318	C130	AT43	E170	ASTR	BE10
A225	A333	A30B	A339	E3TF	B753	A319	C30J	AT72	E45X	B190	BE20
	A343	A310	A342	E6		A320	CVLT	CL60	E75L	BE40	BE58
	A345	B762	A3ST	E767		A321	DC93	CRJ1	E75S	B350	BE99
	A346	B763	A400	IL62		B712	DC95	CRJ2	F16	C560	C208
	A359	B764	A50	IL76		B721	DH8D	CRJ7	F18H	C56X	C210
	B742	C17	AN22	IL86		B722	E190	CRJ9	F18S	C680	C25A
	B744	DC10	B1	IL96		B732	GL5T	CRJX	F900	C750	C25B
	B748	K35R	B2	K35E		B733	GLEX	DC91	FA7X	CL30	C402
	B772	MD11	B52	KE3		B734	GLF5	DH8A	GLF2	E120	C441
	B773		B703	L101		B735	GLF6	DH8B	GLF3	F2TH	C525
	B77L		B741	MYA4		B736	MD82	DH8C	GLF4	FA50	C550
	B77W		B743	R135		B737	MD83	E135	SB20	GALX	P180
	B788		B74D	T144		B738	MD87	E145	SF34	H25B	PAY2
	B789		B74R	T160		B739	MD88	F35	H53	LJ31	PA31
	C5		B78X	TU95		MI26	MD90	F18H	H53S	LJ35	PC12
	C5M		BLCF	VMT		BA11	BE12	F15	H47	LJ45	SR22
			BSCA			P3	F100	C2	V22	LJ55	SW3
			C135			P8	F27	F22	S64	LJ60	B305
			C141			B3XM	YS11		V280	S61R	H500
			DC85							SW4	
			DC86							B214	
			DC87							EC25	

CWT Quick Reference Cards

		Wake Turbulence Separation for Directly Behind								
		Follower								
		A	B	C	D	E	F	G	H	I
Leader	A		5	6	6	7	7	7	8	8
	B		3	4	4	5	5	5	5	5
	C					3.5	3.5	3.5	5	5
	D		3	4	4	5	5	5	5	5
	E									4
	F									
	G									
	H									
	I									

		Wake Turbulence Separation for On Approach								
		Follower								
		A	B	C	D	E	F	G	H	I
Leader	A		5	6	6	7	7	7	8	8
	B		3	4	4	5	5	5	5	6
	C					3.5	3.5	3.5	5	6
	D		3	4	4	5	5	5	6	6
	E									4
	F									4
	G									
	H									
	I									

Numbers (distances) indicate required *Wake Turbulence Separation,* e.g. B following B requires 3NM Wake Turbulence Separation.

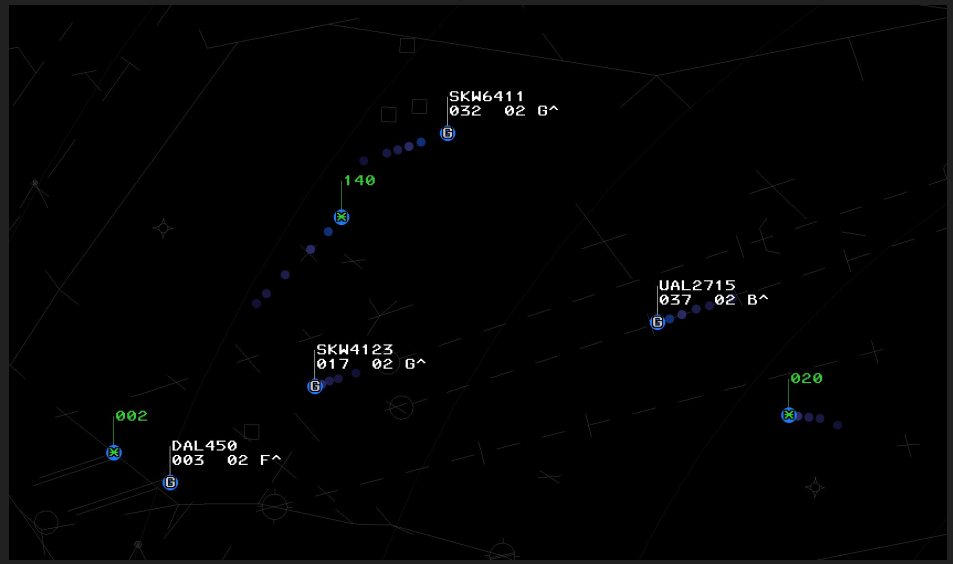
No number indicates no required Wake Turbulence Separation. However, some form of separation must be applied. (e.g. Radar separation, passing/diverging, etc).

Note that the term “on approach” means that the separation between the trailing aircraft and the leading aircraft will exist at the time the leading aircraft is over the landing threshold.

How does this look in STARS?

Where the aircraft's weight class/RNAV capability used to be displayed in their datablock as one character, the CWT category will be displayed instead alongside a caret (^) if the aircraft is RNAV-capable.

In the screenshot at right from CRC, UAL2715 is CWT class B and RNAV-capable.



CWT Alias Reference

- Type .cwtxy to quickly reference the required separation for x behind y
  - Example: .cwtie - I behind E: 4 NM on Approach
  - I stole these from ZLA, thank you ZLA

Additional Information (CWT)

More information on CWT, including time-based separation and the replacements for applicable language in FAA JO 7110.65, is available in FAA JO 7110.126.

Next, we will go over the other new feature in CRC, the Automated Terminal Proximity Alert, or ATPA.

What is ATPA?

- Automated Terminal Proximity Alert, or ATPA, is similar to the TPA cones/rings you may be familiar with already in STARS.
  - These are the cones/rings you draw by typing *P or *J along with a number, then slewing an aircraft (TPA cones are commonly called bats, TPA rings are commonly called J-balls).
- The difference is that ATPA cones automatically adjust based on required separation between leading/trailing aircraft, and will point at the leading aircraft in question.
  - ATPA will also show the distance to the leading aircraft in the third line of the aircraft's datablock.
  - See the following slide for an example.

ATPA Example

In the first screenshot at right from CRC, AAL990 is initially considered to be following AAL3007 by ATPA (as seen by the cone pointing at AAL3007, and the distance readout in AAL990's datablock).

In the second screenshot, AMX784 has turned far enough in toward the final approach course (typically <90 degrees is sufficient in ZFW's adaptations) that AAL990's ATPA cone and distance readout switch to processing AMX784.

Also note that AMX784 does not have an ATPA cone for AAL3007, as ATPA will only display a cone if the trailing distance is greater than the wake turbulence separation required.

How is ATPA adapted?

- ATPA takes a lat/long point of the runway threshold and distances left/right of the centerline, along with a distance and maximum altitude where ATPA processing takes place.
  - On the N/S parallels at DFW, this volume is roughly a 35nm range and about 2nm to either side of centerline, up to 7000ft.
  - AFW, DAL, and DFW diagonals also have volumes with smaller sizes.
  - We are working on getting data for other TRACONs across ZFW
  - On runways authorized for 2.5nm separation within 10 miles ATPA will process for 2.5nm separation by default.

How is ATPA adapted? (cont'd)

- Note that proper scratchpad entry is required in order for ATPA processing to work.

Primary Scratchpads

DFW Arrivals
- Use runway designator only, with approach type in the secondary scratchpad (if different from advertised)
  - Ex. 17C, +ILS

DAL Arrivals
- 13R/31L use W13 or W31
- 13L/31R use E13 or E31

AFW Arrival
- 16R/34L use W
- 16L/34R use AFW

Primary Scratchpads (cont'd)

To exclude an aircraft from ATPA processing, use TFC or JFA in the primary scratchpad. This should be used when an aircraft is transitioning the processing area and does not intend to land at the arrival field.

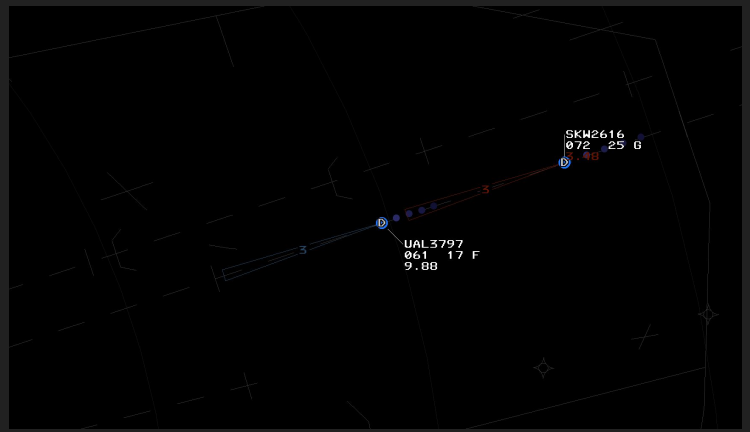
Secondary Scratchpads

+VS (visual separation) will make the target ineligible for ATPA processing, meaning a cone will not display but they will still be counted for mileage in trail.

ATPA Warnings & Alerts

In the event that a trailing track is predicted to violate the allowable in-trail minimum separation within 45 seconds, an ATPA Warning Cone will be displayed in yellow. The distance readout will also be displayed in yellow (See top screenshot at right).

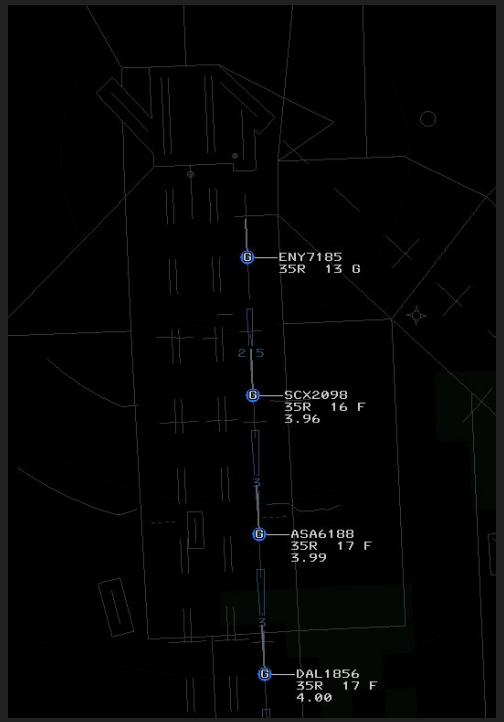
An alert cone (red) will be displayed if the trailing track has violated the allowable in-trail minimum separation or will violate the allowable in-trail minimum separation within 24 seconds (see bottom screenshot at right).

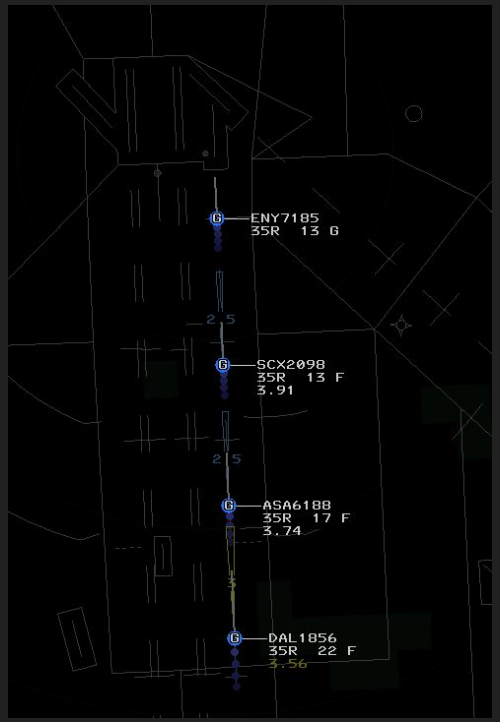


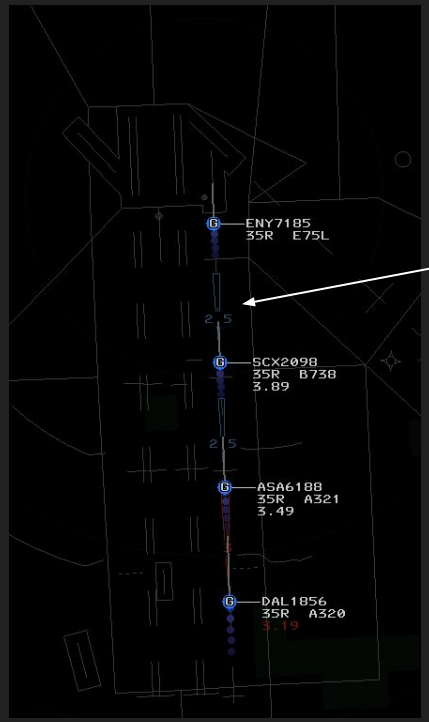
Examples

DAL1856 predicted to lose separation within 45 seconds

DAL1856 predicted to lose separation within 24 seconds



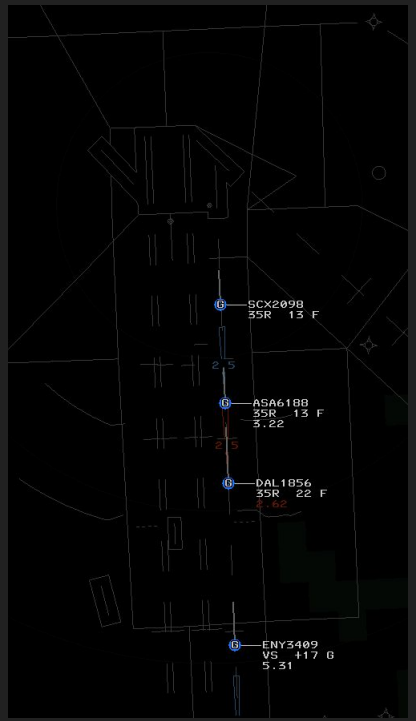




2.5nm separation within 10nm

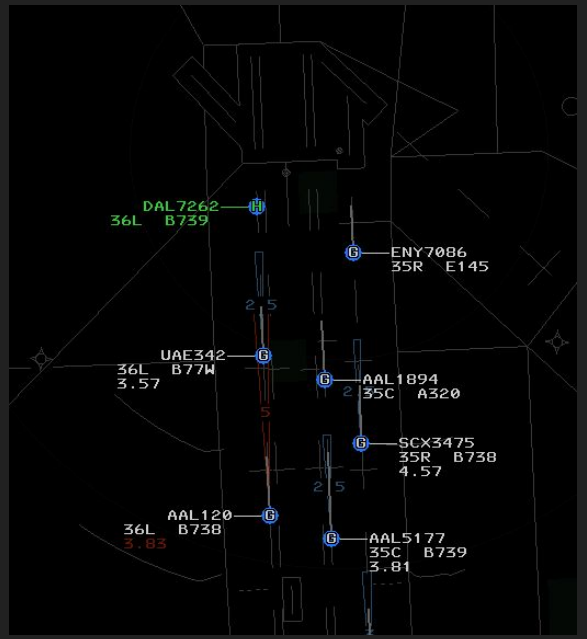
Normal Operations

Examples



ENY3409 has been instructed to maintain visual separation with preceding aircraft

Normal ops



AAL120 does not have the required separation from UAE342. CWT requires 5nm

Questions?

Ask in the Discord!