

USAAS Reference Sheets for Difficulty Technical Controllers - Feb 2024

THRUSTS			
General			
Any thrust with two legs can go to one leg as long as the initial thrust action is completed with two legs			
Back pike: Body bent at hips to form an angle of 45° or less. Legs extended and together. Trunk extended with the back straight and head in line with legs EXTENDED. Poor execution of knee extension is not a basemark, it is a basemark only if the bend is used to enhance the thrust.			
Thrust: From a Submerged Back Pike Position with the legs perpendicular to the surface of the water a vertical upward movement of the legs and hips is rapidly executed as the body unrolls to assume a vertical position. If position changes from a back pike to a surface pike, this is no longer a thrust. May not be evident if legs pass 60 degrees off vertical.			
Flexibility: If hitting a split, the front leg cannot be bent. If the back leg is bent, must be bent downward, not inward. For knight variants, the bent leg must be down and not to the side. If middle split, must meet this document's definition of middle split as found in flexibility section.			
Type	Number of legs	Ending	Other Clarifications
T1	1 or 2	Any after maximum height	Any kind of fall or crash (including an arch out, falling spin, split) is acceptable after the initial thrust is completed
T2	1	Any after knees are under	1 leg at max height, and 1 leg stays in the cone until knees (you could join, etc, you can always do more than you declare). No crashes from max height.
T3	Spin - 1 Thrust - 2	Any after knees are under	
T4	Spin/Twirl - 1 Flexibility - 2	Any after flexibility, spin or twirl	Must complete what was claimed (flexibility, twirl *wall to wall*, etc) and then can then do anything (crash, etc.). We recommend that you signify the completion of the flexibility in some way, so that it is not confused with a T1.
T5	2	Any after spin or twirl	Movements during spin must be "close to vertical" - in the 45 cone, refer to the black lines in the illustration. The feet may leave the 45 degree cone if the thighs and knees stay in the cone.
T6-8	2	Any after knees are under	
T9	2	Any after catch (above knees)	Thrust continued by catching (clearly stopping – stable height demonstrated) in a VP above the knees. The recommendation is a full second. No "rolling stops" - must fully stop. Components of thrust need to be obvious - backpike underwater followed by rapid unroll.

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ROTATIONS (PAGE 1)		
Twirls/Twists that don't stay at the same height - see descriptions in the Figures Manual. Basic Movements 12&13	Twirls that look like they are ascending: BM 13 describes an ascending spin as follows: An <i>ascending spin</i> begins with the water level at the ankles unless otherwise specified. BM 13 also describes vertical upward spins as follows: 7. A vertical upward <i>Spin</i> is executed until a water level is established between the knees and hips. If the athlete rises 2 or more levels (per the height chart), this will go to base mark. This only applies to hybrids, not TREs.	Twirls that look like they are descending: based on the AQUA description of BM 13 (descending spin): Any twist or twirl that has a noticeable descent (2 or more levels per the height chart) would not be a twirl, but a descending spin. This only applies to hybrids, not TREs.
Twisting/Twirling /Spinning at ankles in Free Hybrids	If the athlete(s) do more than half the rotation without any ascending or descending, it is basemark. See page 7 of the hybrid difficulty manual.	
Twists/Twirls/ Spins 1 leg versus 2	Any time a Two Leg Twist, Twirl, or Spin is declared, both legs must start in the air (within the cone) prior to the initiation of the rotation and remain in the air (within the cone) through completion of the declared rotation.	Any time a One Leg Twist, Twirl, or Spin is declared one leg must be vertical (within the cone) prior to the initiation of the rotation, and one leg must remain in the air through completion. The legs may join during the rotation.
Unbalanced rotations	Rotations that have a component of "off-balance" must stay within the cone (see image in this document) but cannot go vertical until after the completion of the rotation. Cannot be more than 45 degrees from vertical during the rotation, and entire rotation must maintain a visible deviation from vertical (at least 10 degrees from vertical).	When "Unbalanced" is stated it means both legs, from knees to feet, in the same direction: forwards, backwards or sideways. Body position arched, piked, or tilted. The athlete(s) must initiate the rotation in the unbalanced position and stay unbalanced the entire twist. If the athlete(s) go through vertical at any point prior to the completion, the hybrid would base mark. If one leg bends while the other leg is unbalanced and the swimmer's center of gravity out of the vertical line is compensated by knee bending that keeps the swimmer in a stable position – this does not qualify as unbalanced.
Combined Spins	Combined Spins and Reverse Combined Spins do not have any allowance in the degree of rotation.	Athletes must start/end at same spot. If reverse combined spin begins with toes below the surface, it must end as toes go under. There may not be a change in position between the ascending and descending

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		spins. Position changes during rotation are ok if within the cone.
ROTATIONS (PAGE 2)		
Two Direction Rotation	From the difficulty manual, page 6: A "Two-Direction" rotation (spin or twist) means a rotation in one direction followed without pause by an equal rotation in the opposite direction.	Two-Direction Twist 360: a twist of 180 in one direction followed without pause by a 180 twist in the opposite direction Two-Direction Combined or Reverse Combined Spin 720: a descending or ascending spin of 720 followed without pause by a descending or ascending spin of 720 in the opposite direction.
Spinning More	In free hybrids, athletes can spin more than the declared amount in Twists/Twirls/Ascending Spins/Descending Spins. Doing so is not a base mark.	In Two-Direction Twists/Twirls and Combined/Reverse Combined Spins: the rotations must be equal. If an athlete Twists more in an R7, they should do the same amount more when Twisting the opposite direction. Same principle for combined spins.
Spin/Twist Allowances - Free Hybrids (Free or Tech Routines)	No allowance for Rotations. All athletes must hit the declared rotation. Descending Spins must be completed by toes. Ascending spins - the start of the rotation begins when the DTCs see the rotation happening. Turning 1/4 underwater before toes break the surface in a R3 (spin ascending 180-360) would be a base mark if the rotation was 180 only. If turning while straightening legs, if knees are within 45 degree cone, this is not a basemark	In Youth Team: All youth teams are required to have a 720 spin (R3). Although this is a required part of their routine, it is not a TRE and therefore does not have an allowance. It can be completed by toes. If the 720 is not completed by all athletes by the toes submerging, there is a 0.5 penalty assessed by the Referee. It would only base mark if all athletes did not completed the minimum declared spin (in the case of R3 they must make a 360)
Spin/Twist Allowances - Technical Required Elements	Tech Elements: Technical Required Elements that have rotations do have an allowance as per the Figures Manual. Descending rotations must be completed by the ankles. Twisting/twirling at ankles is allowed.	BM 12 Twist Allowance - The allowance for Twist rotations (Half Twist, Full Twist, and Twirl) is up to 1/4 less/more than the required rotation. BM 13 Spin allowance 1 - The allowance for a Continuous Spin is up to 180 degrees less/more than the required rotation. BM 13 Spin Allowance 2 - The allowance for other spins (180 Spin, 360 Spin, 720 Spin, Twist Spin, Spin up 180, Spin up 360) is up to 1/4 less than/more than the required rotation. There is no allowance on combined spins.

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ROTATIONS (PAGE 3)	
R1	Must see a rotation of at least 180 degrees. Can go more than 360.
R2	Twist or Twirl 180 with One Leg: initiation of the twist/twirl starts with 1 leg, but athletes may join while performing the action.
R3	Spin Descending 360-720: if athletes drop to ankles after 180, and twist/twirl at ankles for 180 or more, this would base mark.
	Twist/Twirl 180 both legs should already be vertical (within the cone) before starting the rotation. If the athletes start with 1 leg up and join while twirling/twisting 180, this would be base mark (should be declared as an R2)
R4	Spin descending 1080-1440: If the athletes drop to ankles by 540 and twist at ankles for 540 or more, this would base mark. Spin ascending 720-1080: If athletes start spin at ankles and perform more than 50% of rotation twirling without rise, this would base mark
	Twist 360: legs should be within cone prior to starting rotation. Starting w/1 leg up and join while twirling/twisting 180, would be base mark.
R5	Twist Opening 360 VP to Split: Can go to any split, including middle (must meet this document's definition of middle split). Should be clear that legs are opening from the start. Turning more than 180 in vertical, without legs opening, would be a base mark. Legs may bend.
	Twirl 360: the legs should be established as vertical (within the cone) prior to starting the rotation. If the athletes start with one leg up and join while twirling/twisting 360, this would be base mark (should be declared as an R3)
R6	Two-Direction Combined Spin 360 with 1 leg: a descending spin of 180 followed by an ascending spin of 180 in the opposite direction would not count as a Two-Direction. Each spin must be 360-720 (and be equal)
	Spin ascending 1440 with 2 legs: if the athletes spin at ankles for 720 or more without rise, this would base mark
	Twist Closing 360 from Split to VP: Can start in any split. Should be clear that legs are rising and closing from start. Legs may bend. Any rate of leg closure is acceptable as long as 360 rotation is completed and legs start in split and end in the cone.
R7	Two-Direction Combined Spin 360 with 2 legs: a descending spin of 180 followed by an ascending spin of 180 in the opposite direction would not count as a Two-Direction. Each spin must be 360
	Two-Direction Twist 360: Athletes twist 180 in one direction and without pause (no additional moves) twist 180 in the opposite direction. An extended pause is not a basemark, this is execution
	If one leg bends while the other leg is unbalanced and the swimmer's center of gravity out of the vertical line is compensated by knee bending that keeps the swimmer in a stable position – this does not qualify as unbalanced.
R8	Two-Direction Combined Spin 720: a descending spin of 360 followed by an ascending spin of 360 in the opposite direction would not count as a Two-Direction (should be an R7). Each spin must be 720
	Two-Direction Twist 720: Athlete(s) twist 360 in one direction and without pause (no additional moves) twist 360 in the opposite direction. An extended pause is not a basemark, this is execution
R9	Two-Direction Combined Spin 1080: a descending spin of 1080 followed by an ascending spin of 1080 in the opposite direction is needed.

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FLEXIBILITY	
General: Actions require doing the stated action/transition without pause points/bent knees.	
Positions: All the positions in the chart must be clearly shown: F2/F6 should show the arch, F2/F4 should show the layouts	
Knight: Lower back arched, with hips, shoulders and head on a vertical line. One leg vertical. Other leg extended backward with the leg at the surface of the water and as close to horizontal as possible. Hip joints and shoulder joints on a horizontal line with both of these alignments 'square' and parallel to each other. The top of the horizontal extended leg faces upward. Must be distinct from a side fishtail position.	
Middle split: If knees are facing down, the angle of the split should be 90 degrees or greater, otherwise it is a pike position. If knees are facing the wall the angle of the split is only considered by execution judges	
F1	Could potentially miss position "if blinked"
	F1-F2 or F1-R6 or T1-F1 are allowed. F1-F3 (if split to split through vertical) or R5 (360 vertical to split)-F1 are NOT allowed.
F2	Clearly Demonstrated Split: needs to show hold with no change in position or height (at least one second). Need to be able to see the position "even if blinked"
	F2-F2 or F2-R6 or T1-F2 are permissible IF CLEARLY held split
	Walkout Front: "The front leg is lifted in a 180° arc over the surface of the water to meet the opposite leg in a Surface Arch Position and with continuous movement an Arch to Back Layout Finish Action is executed." Must at least make an attempt at square hips in the arch, hips should stay square and legs extended all the way to the back layout position. Have to show unrolling action from arch to layout. Cannot be a side walkout.
	Permissible to do a Back Layout to Surface Arch or Bent Knee Surface Arch as an F2 into F4, F5, F6
F3	Cannot claim an F1 and F3 (split to split through vertical) as this is double dipping. Can claim an F3 and F2 if split is held an extended amount of time. Permissible to claim F1 and F3 if the F3 is the ariana rotation.
F5	Any F5 declarations have to start with either a knight position or a BK surface arch position.
	Sustained Knight Position: needs to show hold w/no change in position or height (at least 1 sec.) - see position "even if blinked"
	Combination of knights: any 2+ clearly shown knights separated by anything (knight >bk surface arch >knight is ok, flick, knee to side, partial bend all ok)

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AIRBORNE WEIGHT	
AW1	In Fishtail descent: descent must happen as the leg is simultaneously closing and sinking.
	In Bent Knee Vertical descent: position may be maintained or legs may join
	If a descent is executed from a high VP (9.5-8.5) until below the knee (4.5) and then a crash occurs, then an AW1 still applies.
AW2	Vertical descent: One leg must be isolated in vertical for descent. Permissible to perform non-vertical positions if legs remain within 45 degree cone. If a descent is executed from a high VP(9.5-8.5) until below the knee (4.5) and then a crash occurs, AW2 still applies.
	Pike to vertical position: Pike variants to vertical variants. Both legs must stay straight in lift up to vertical position and be lifted at the same time. No bending up. Slight deficiencies in knee execution are a judging factor and will not result in a basemark.
AW3	Vertical ascent must not bend at the knees before reaching above knees (6.5 height). Once max height is achieved movements can occur. There is no minimum time for AW3 to count, the kneecap must be seen by the DTCs. Recommend at least 3 levels of rise for ascent to be noticeable.
	No bending the knee outside the cone. One leg must remain vertical (within the cone) at all times, may not switch legs
AW4	May switch legs during AW4, but must always have 1 leg in the cone. Should time with stopwatch.
AW5	One leg must stay isolated. Once established, leg must remain isolated a minimum of 3 seconds. Horizontal leg must move. Should time with stopwatch. Isolated leg must be within the cone. Timing begins when isolated leg enters the cone.
AW6	Both legs must stay in the cone for minimum of 3 seconds - micro movements and knee bends may take place within the cone. Should time with stopwatch.
AW7	Both thighs must be 10 degrees to 45 degrees off balance in side, pike or arch positions. Cannot be more than 45 degrees from vertical, and must maintain a visible deviation from vertical (10 degrees from vertical). Should time with stopwatch.
	Legs may move around the cone but must stay off balance during a minimum of 3 seconds and can not stop in a balanced position
	When “Unbalanced” is stated it means both legs, from knees to feet, in the same direction: forwards, backwards or sideways. Body position arched, piked, or tilted.
	If one leg bends while the other leg is unbalanced and the swimmer’s center of gravity out of the vertical line is compensated by knee bending that keeps the swimmer in a stable position – this does not qualify as unbalanced.

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CONNECTIONS
C1 is a connection on the surface of the water without one or more legs within the cone for both athletes
C2, C3, C4, C5, and C6 require the connected legs to be in the air, with the legs near the vertical line
For C2, C3, C5 the bottom/non vertical leg may also be connected but it is not required to be connected
C4 may be done in a line with end swimmers only connected by one leg. Line MUST be 4 athletes.
In a team, claiming C1-6 means all athletes must be part of pair connections (ex 4 groups of 2 athletes). Claiming C1-6+ means that the athletes must be connected in groups of 4-8 athletes. If doing 2 groups, C1-6+ requires 8+ athletes (must have 2 groups of 4+ athletes)
Connected actions must finish (disconnect) before starting the next declared difficulty. Example: C3 is declared but athletes are also connected at the surface, they may disconnect their vertical leg, do a 180 twist and claim an R2. If they claim C3 and then R2 but do not disconnect at the vertical leg until after the rotation, that be basemark because the 180 was not achieved after the C3. Only the vertical leg needs to disconnect.

GENERAL
If declared difficulty is not completed by the time music ends, the hybrid will go to base mark (ref. AS 14.2). If an athlete is doing an R3 as a 360-720 spin and has completed at least 360 before the music ends, the hybrid would pass, but not if less than 360 is completed.
If a hybrid is factored, only that fraction of athletes need to complete the factored difficulty. If 6 of 10 athletes in a combo perform an R5, it is factored by 0.5 since not all athletes perform R5. If 5 of 6 athletes complete R5, the hybrid passes even if the 6th athlete does not complete R5.

PATTERN CHANGES
Traveling required to create pattern change cannot simultaneously be counted for travel bonus. Athletes creating pattern change should be visible on or above the surface.
A credited number of pattern changes N requires N+1 patterns to be executed (e.g. 2 pattern changes means 3 patterns)

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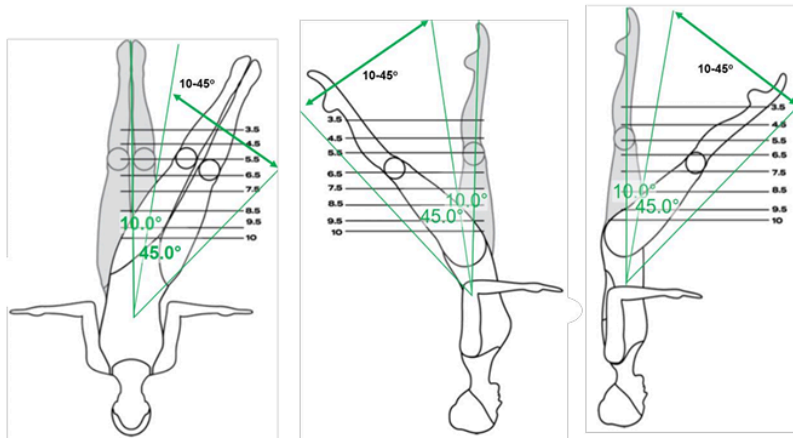
TRAVEL
All swimmers (unless factored) must move 1.0 meters (3.3 feet) or more in the same direction during the hybrid. Athletes must travel at least one meter in one direction before traveling in another.
Travel can be factored if only a portion of the swimmers are doing the travel (e.g. if only 4 of the 8 athletes in a team routine travel in a hybrid, the travel bonus would be factored)
Travel during entry (pull-down) and/or exit (walkout) does not count as travel, nor does travel required solely to create a declared pattern change. Travel may be declared during a pattern change only if the entire pattern moves 1 meter.
Travel should only occur in one direction. Hybrid must start in one place and end in another (e.g. if swimmers travel 1.5 meters in one direction & then reverse direction & travel 1.5 metered back to the starting point, this does not count as travel & the hybrid will go to basemark)

SYNCHRONIZATION (BONUS)
In teams and combos, synchronization bonus may be declared for hybrids with 7 or more movements performed. If fewer than 7 movements are performed in a hybrid with a declared synchronization bonus, it is a basemark.
Identical movements performed with opposite legs, or moving/rotating opposite directions, are considered synchronized movements
SY-F can be declared for a hybrid with up to three asynchronous movements

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ILLUSTRATION OF CONE FOR AIRBORNE WEIGHT AND ROTATION FAMILIES



PAIR ACROBATICS

Throw (W) and Jump (J)	Recommended for DTCs: Look at the speed of the descent to help determine if there was a disconnect. A throw/jump should be dynamic. Sustained height indicates it is a lift.
Somersaults	Must be within 90° of declaration (can rotate more) Counted until half the body is underwater. For 360 somersaults, must be fully above water for entrance. Jfs1B - finish at chest level
Twists	Head up - count rotations until Chest of featured swimmer is underwater Head down - count rotations until knee cap is underwater Allowance: Within 90° for 180°; Within 180° for 360°
Flexibility	Flexibility needs to be at maximum height (i.e. not as a crash into splits at the bottom of the lift) Splits - back leg can be bent, small bend forward (not Iguana) Ex. positions from Acrobatics Manual: Vertical Split / Glass / Swan / Eye, Knight (body position) or Willow, Ring

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LARGE ACROBATICS	
Possible causes for basemark	Note: Doing more than declared is NOT a basemark, as long as what is declared is done
Type of Acro	<ul style="list-style-type: none"> • AJ is a jump, AW is a throw • BS is a stack, BL is a lift • CC is onto support, CT is through a support, CO is other • PP is standard platform • PF is a float lift
Size and Type of Construction	<p>Check for Small vs Large</p> <ul style="list-style-type: none"> • Large is 7+ swimmers involved, including the featured swimmer and support swimmer • surf vs Surf, Sho vs Shou, p vs P, st vs St, etc. • In group C, constructions with 2 formations may involve a different number of base swimmers • In group P, a 2024 season waiver allows routines with 6 or fewer swimmers to claim any code except "P" (straight body, which has a corresponding small group code "p") <p>To be considered a jump action (using the ">" symbol) in a combined acrobatic, the featured swimmer cannot be connected to both constructions when breaking the surface. The action moving between the constructions must show power and speed consistent with a jump (as opposed to a climbing action).</p>
Direction (A&C only)	<p>There are 2 possible Forward claims</p> <ul style="list-style-type: none"> • FORW for when featured swimmer does 1+ somersault or 1+ twist • Forw for all other forward direction including handspring and cartwheel • For jump/cartwheel/handspring - direction should be that which featured swimmer demonstrates during "take-off" phase (beginning of the acrobatic movement).
Positions	<ul style="list-style-type: none"> • Can claim 2 positions. 3rd and subsequent positions can be claimed as a bonus • Starting position is not counted • Hand positions are optional unless specified • 45 degree allowance for all positions • Group C: Either group A or B positions can be declared as long as positions are executed • Positions counted until shoulders (head down) or knees (head up) of featured swimmer are submerged. • For Glass, Eye, Pin, Drop, Queen - must have a hand capture with opposite or both arms. • Vertical Split, Swan, Sail, Scorpio, Needle - can be done with or without hand capture.

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LARGE ACROBATICS	
Rotation of construction allowance (P only)	<ul style="list-style-type: none"> -15 degree allowance for 90 degree rotation (P only) -30 degree allowance for 180 degree rotation (P only) -45 degree allowance for 360 degree rotation (P only)
Rotation of Construction (B,C,&P only)	<ul style="list-style-type: none"> Must have visible rotation, not just a turn of the featured swimmer's trunk Rotation counted between featured swimmer breaking surface and submerging to waist For R0,5, etc (featured swimmer stands on 1 leg and other one is at 135 or 180 degrees), featured swimmer MUST perform one position (from beginning to end) or two positions with degree of leg 135-180 from beginning until end of the declared rotation.
Rotations of Featured swimmer (A, B, & C only)	<ul style="list-style-type: none"> -90 degree allowance for somersault. More than claimed is fine. -180 degree allowance for twists. More than claimed is fine. For group A - levels above knee (pike), mid thigh (jay, kite), crotch/feet (tuck) For group A - count twists until chests/lower ribs in water For group B - count twists until featured swimmer reaches waist Twist allowance is only given if there is a non-zero degree of twist achieved (must have visible rotation, see p. 5 of acrobatic quick reference guide) -45 degree from vertical allowance for cartwheel/roundoff/handspring In group C where the featured swimmer interacts with a second construction, total rotation is calculated from the swimmer leaving the first construction until their entrance into the water Swimmers have to enter feet first if a coach declares somersault 360 and they start with head up. In a pike position, this means that the head and feet both enter the water together for a 360 somersault. Cannot land exactly head down, must be slightly past For somersault in a pike position, going from the jump to the pike, that counts as 180 of rotation.
Bonus	<ul style="list-style-type: none"> Look for obvious errors, like claiming simultaneous lifts with Large construction claimed W2, W11, W12 - spin independently, all others stay static (movement is like a ballet dancer on their "pointe shoe") Y12 (blind jump) - permissible to be connected For third position bonus where the third position is head-down – the third position is counted as long as executed before the waist of the featured swimmer is submerged U5 bonus - there is a misprint in the quick guide. The description should say "Straight body position during twist + somersault jump (start from 1 somersault + 1 twist and more).
Surface lifts	<ul style="list-style-type: none"> Lsurf, L, and "upside down L" will all be treated as the same by tech controllers for now

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