

AERONAUTICAL CHARTING MEETING
Instrument Procedures Group
Meeting 22-01 – April 25-26, 2022

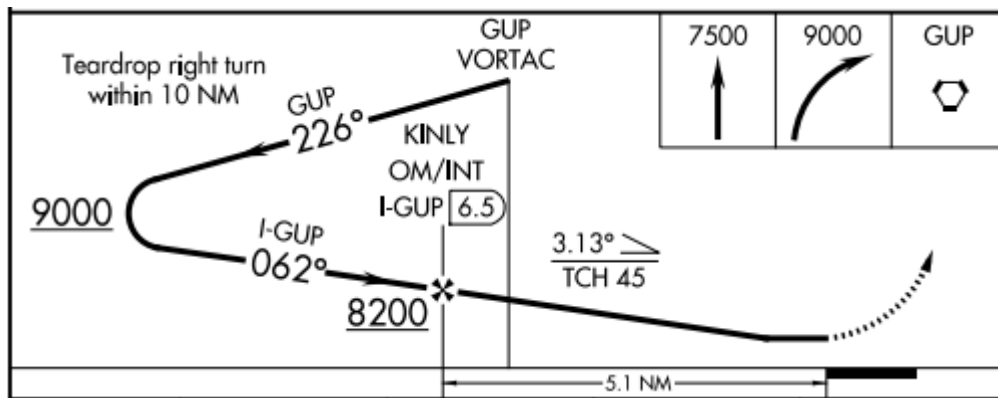
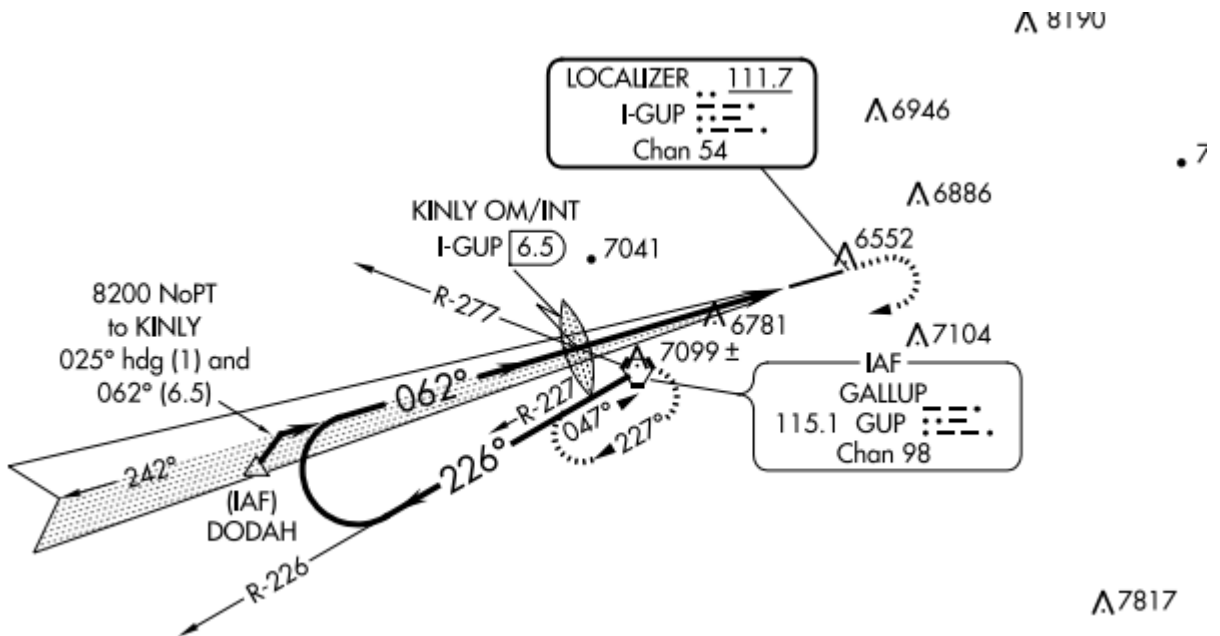
RECOMMENDATION DOCUMENT

FAA Control # 22-01-365

Subject: As Charted, Teardrop Course Reversals Lack Pilot Guidance on How to Fly the Reversal

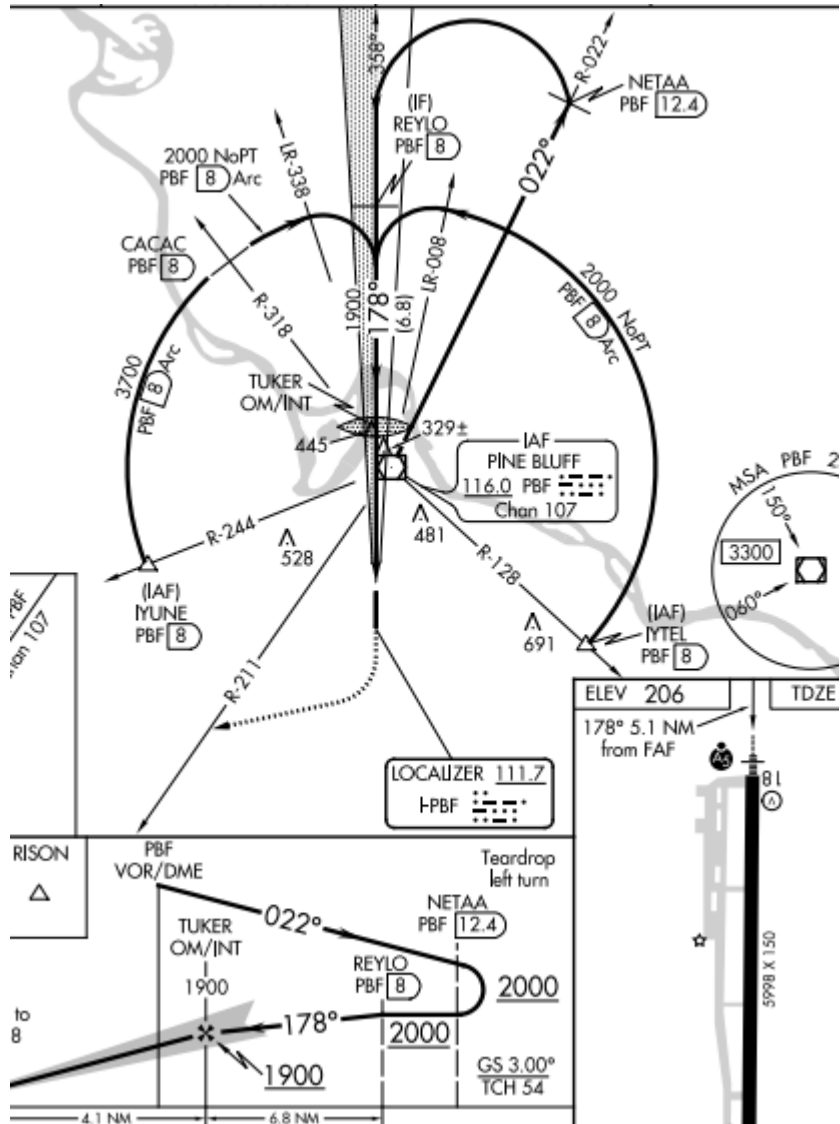
Background/Discussion:

Here is a teardrop course reversal (excerpted from GUP LOC 6, Appendix A has full procedure):



The FAA publishes extensive pilot guidance on other course reversals; namely procedure turn, hold-in-lieu of procedure turn, and DME arcs. However, there is no substantial guidance on how to fly a teardrop. Ask most pilots “how to” and they will respond, “standard rate turn,” which is incorrect.

Problems may result from lack of guidance; for example, in PBF (full chart in Appendix A), there is no profile view “remain within” distance note for the teardrop. Without this note, the turn from NETAA to intercept the final is technically unbounded as there is no way to follow the depicted semicircle (when flying the approach with conventional navigation).



When Teardrops are presented by a FMS, depending on ARINC 424 coding and the display software, the Teardrop may be shown like the as-charted, as a 90-degree intercept, or a sharp 180-degree turn.

Recommendations:

If charting continues to depict Teardrops as semicircles, provide pilots with AIM and/or IPH guidance equivalent to procedure turn, hold-in-lieu of procedure turn, and DME arcs.

Alternatively, change procedure design and/or charting to provide a navigable route line.

Comments:

Submitted by: Dr. Bill Tuccio

Organization: Garmin

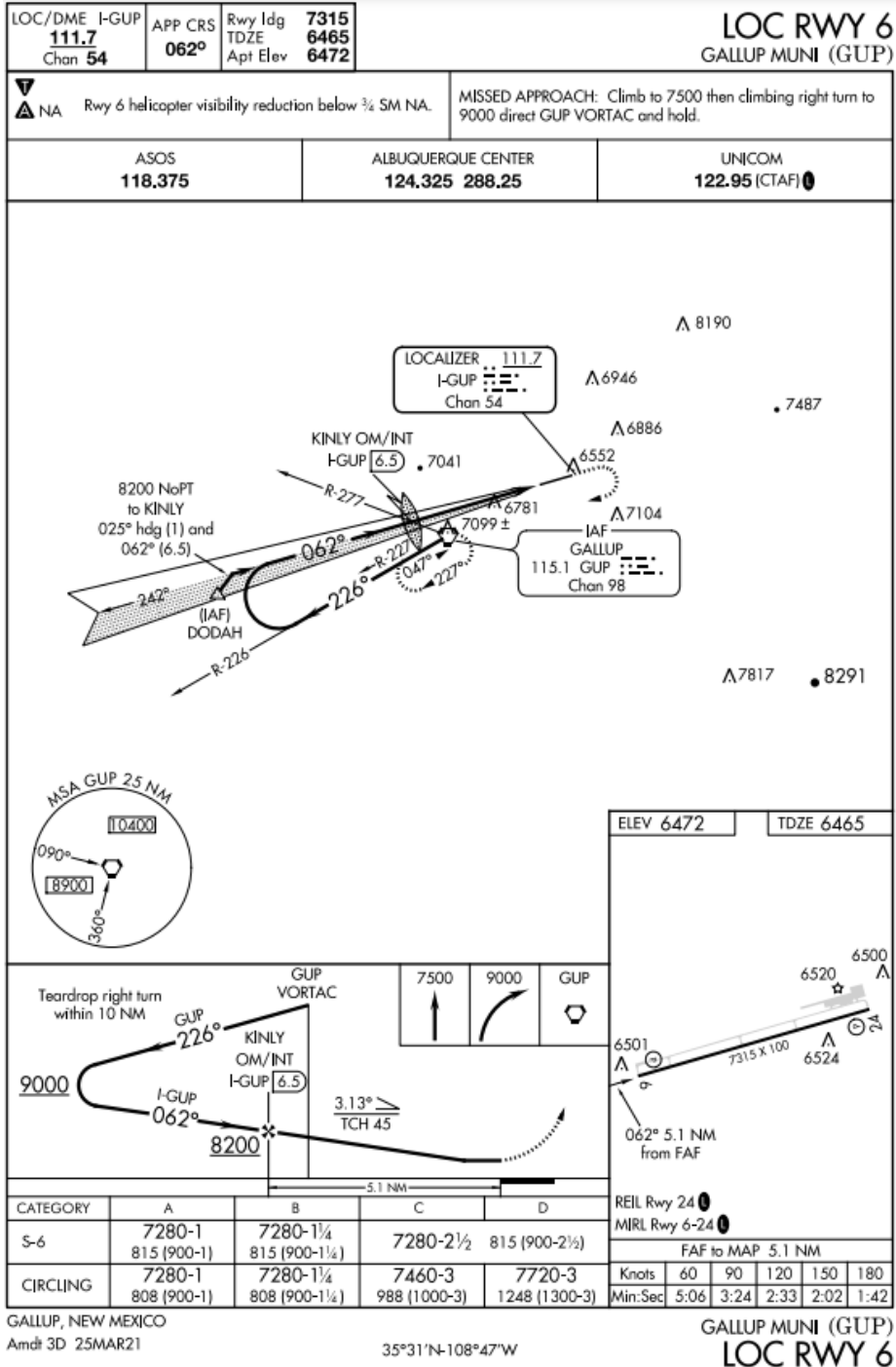
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Date: 3/2/2022

Please send completed form and any attachments to:
9-AMC-AVS-ACM-Info@faa.gov

Appendix A Example Procedures with Teardrop Course Reversals



PINE BLUFF, ARKANSAS

AL-901 (FAA)

21280

LOC I-PBF 111.7	APP CRS 178°	Rwy ldg TDZE Apt Elev	5998 206 206
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ILS or LOC RWY 18

PINEBLUFF RGNL/GRIDER FLD (PBF)

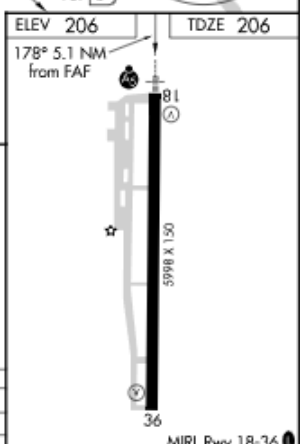
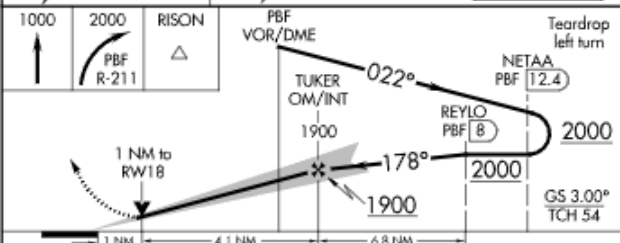
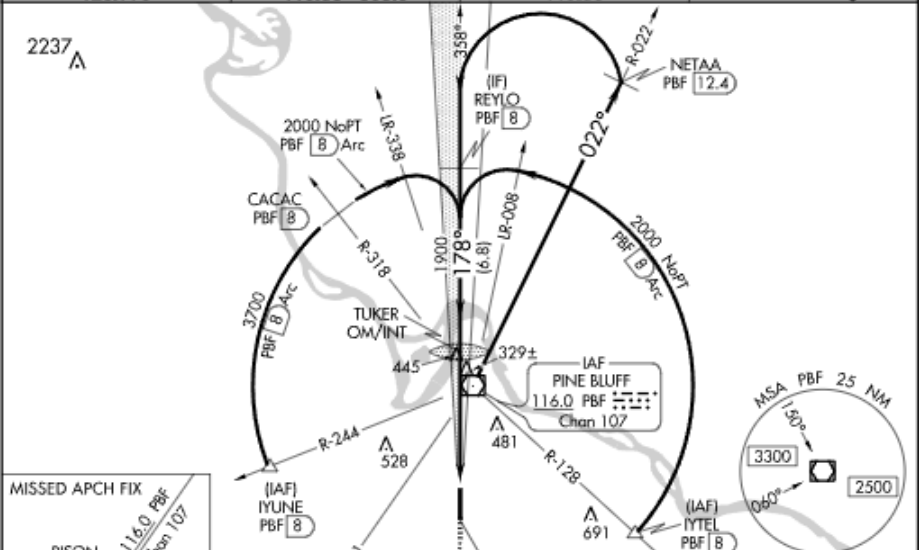
DME required.

▼ Rwy 18 helicopter visibility reduction below 3/4 SM NA. Inop table does not apply to S-ILS 18. For inop ALS, increase S-LOC 18 all Cats visibility to 1 SM. For inop ALS when using Stuttgart altimeter setting, increase S-LOC 18 Cat A/B visibility to 1 SM. DME from PBF VOR/DME. DME requires simultaneous reception of I-PBF and PBF DME. When local altimeter setting not received, use Stuttgart altimeter setting; increase DA to 541 feet and all MDA 80 feet; increase S-LOC 18 Cat C/D visibility 1/4 SM and Circling Cats C/D visibility 1/4 SM.



MISSED APPROACH: Climb to 1000 then climbing right turn to 2000 on PBF VOR/DME R-211 to RISON/PBF 15 DME and hold.

ASOS 120.775	LITTLE ROCK APP CON 119.85 353.6	CINC DEL 119.85	UNICOM 123.0 (CTAF)
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CATEGORY	A	B	C	D
S-ILS 18		466-3/4	260 (300-3/4)	
S-LOC 18		580-3/4	374 (400-3/4)	
C CIRCLING	660-1 454 (500-1)	680-1 474 (500-1)	840-1 3/4 634 (700-1 3/4)	880-2 1/4 674 (700-2 1/4)

FAF to MAP 5.1 NM					
Knots	60	90	120	150	180
Min:Sec	5:06	3:24	2:33	2:02	1:42

PINE BLUFF, ARKANSAS
Amdt 3E 07OCT21

34°10'N-91°56'W

PINEBLUFF RGNL/GRIDER FLD (PBF) ILS or LOC RWY 18

SC-1. 24 FEB 2022 to 24 MAR 2022

Initial Meeting 22-01: Bill Tuccio, Garmin, briefed the item from the RD (slide) saying there are not many of these in the NAS, and little guidance on how to chart or fly them exists. An example teardrop is shown on the RD slide. His concern is the aircraft could go into the wrong airspace, and that most pilots may think it requires a standard rate turn. The FAA provides specific guidance for other turns, but this just says teardrop left turn within 10 NM. Bill would like explanatory information in the AIM, IPH, and IFH on how to fly these procedures. Jeff Rawdon, FAA Flight Procedures and Airspace Group (FPAG), advised these are charted to scale, and advised the procedure represented on the first page of the RD at KGUP is an outlier and not compliant with current criteria. FAA Order 8260.3 requires a turn fix for these course reversals and added obstacle protection areas are developed based on that turn point. Bill said the rate of turn after the outbound fix is the question due to lack of guidance. Joshua Fenwick, Garmin, said the question concerns what the pilot should do after the outbound fix. Also, the database providers display the route differently to join the localizer differently. Rich Boll, NBAA, has no problem with the current display, saying he has never had an issue teaching or flying them. Rich said AIM 5-4-9 describes this as a turn after the fix to join the localizer, and is usually done with a standard rate turn. Rich said this a graphical depiction for direction of a turn, not a specific route, arc, or path to follow, but added the guidance is lacking a bit and could be bolstered. Bill asked Rich how he would fly or teach these, and Rich said after the turn fix, they do a standard rate turn to a 30 degree or 45 degree intercept heading, then join the inbound final course. Bill advised that is what they wanted to know and answers their question. Vince Massamini, general aviation pilot, said these are very common, and do not present a challenge, but agree maybe some more guidance would be helpful.

Actions: This item will be reviewed by the ACM Recommendation Review Group to determine any action and that outcome will be provided at ACM 22-02.

Status: Item open.
