

**NORTH ATLANTIC TREATY ORGANIZATION
ORGANISATION DU TRAITE DE L'ATLANTIQUE NORD**

*MILITARY AGENCY FOR STANDARDIZATION (MAS)
BUREAU MILITAIRE DE STANDARDISATION (BMS)
1110 BRUSSELS*

Tel : 707.5589
Fax : 707.57.18
masair@hq.nato.int
AIR BOARD

MAS(AIR)44-AS/3297
27 February 1996

To : See MAS Distribution List Air B

Subject : **STANAG 3297 AS (EDITION 5) – FLAME-OUT PROCEDURES**

Reference : MAS(AIR)257-ATS/3297 dated 29 June 1992 (Edition 4)

Enclosure : STANAG 3297 (Edition 5)

1. The enclosed NATO Standardization Agreement which has been ratified by nations as reflected in page iii is promulgated herewith.
2. The reference listed above is to be destroyed in accordance with local document destruction procedures.
3. AAP-4 should be amended to reflect the latest status of the STANAG.
4. The Air Board, MAS considers this an editorial edition to the STANAG; previous ratifying references and implementation details are deemed to be valid.

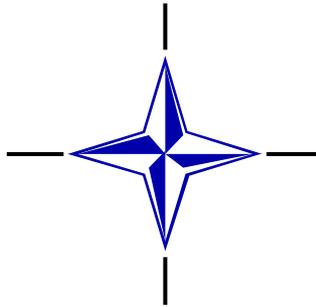
(Original Signed)

G.B. FERRARI
Major-General, ITAF
Chairman, MAS

NATO UNCLASSIFIED

STANAG No 3297
(Edition 5)

**NORTH ATLANTIC TREATY ORGANIZATION
(NATO)**



**MILITARY AGENCY FOR STANDARDIZATION
(MAS)**

**STANDARDIZATION AGREEMENT
(STANAG)**

SUBJECT: FLAME-OUT PROCEDURES

Promulgated on 27 February 1996

(Original Signed)

G.B. FERRARI
Major-General, ITAF
Chairman, MAS

NATO UNCLASSIFIED

NATO UNCLASSIFIED

RECORD OF AMENDMENTS

No.	Reference/date of amendment	Date entered	Signature

EXPLANATORY NOTES

AGREEMENT

1. This NATO Standardization Agreement (STANAG) is promulgated by the Chairman MAS under the authority vested in him by the NATO Military Committee.
2. No departure may be made from the agreement without consultation with the tasking authority. Nations may propose changes at any time to the tasking authority where they will be processed in the same manner as the original agreement.
3. Ratifying nations have agreed that national orders, manuals and instructions implementing this STANAG will include a reference to the STANAG number for purposes of identification.

DEFINITIONS

4. Ratification is "In NATO Standardization, the fulfilment by which a member nation formally accepts, with or without reservation, the content of a Standardization Agreement" (AAP-6).
5. Implementation is "In NATO Standardization, the fulfilment by a member nation of its obligations as specified in a Standardization Agreement" (AAP-6).
6. Reservation is "In NATO Standardization, the stated qualification by a member nation that describes that part of a Standardization Agreement that it will not implement or will implement only with limitations" (AAP-6).

RATIFICATION, IMPLEMENTATION AND RESERVATIONS

7. Page iii gives the details of ratification and implementation of this agreement. If no details are shown it signifies that the nation has not yet notified the tasking authority of its intentions. Page iv (and subsequent) gives details of reservations and proprietary rights that have been stated.

Agreed English/French Texts

STANAG 3297
(Edition 5)

NAVY/ARMY/AIR

NATO STANDARDIZATION AGREEMENT
(STANAG)

FLAME-OUT PROCEDURES

- Annexes: A. Typical Overhead Flame-out Pattern - VMC
 B. Typical Straight-In Flame-out Pattern - VMC

Related Document : STANAG 3642 AS – SINGLE FREQUENCY APPROACHES

AIM

1. The aim of this agreement is to establish common recovery procedures in the event of an aircraft engine flame-out.

AGREEMENT

2. Participating nations agree to adhere to the procedures outlined in paragraphs 3 through 10. The application of this STANAG in times of tension and war is subject to the decision of the appropriate operating authority.

GENERAL

3. Although the term "flame-out" is used to describe the complete loss of engine thrust in jet aircraft, these procedures may be used by non-jet aircraft or for partial loss of power in either jet or non-jet aircraft.
4. This STANAG is not intended to supersede flame-out procedures contained in aircraft operating manuals or those established by operating commands. It is intended as a basis for Air Traffic Services (ATS) procedures to be used to assist pilots who experience an actual (not practice) flame-out. The aim of these procedures is to bring an aircraft into visual contact with an airfield at a suitable height for a landing to be attempted.
5. Whenever an actual flame-out is notified to ATS, it shall be considered and handled as an emergency condition.
6. It is the responsibility of the pilot in command to determine whether a flame-out recovery should be attempted after consideration of data provided by ATS, the particular situation that exists, and his operating command flame-out procedures for the type of aircraft being flown.

INITIAL ACTION

7. Action by the Pilot. When aware of a flame-out condition the pilot should:
 - a. Make a distress call as soon as possible and squawk emergency. The call should include aircraft type, altitude and position.
 - b. Advise ATS of his intentions and request any assistance required immediately, such as determining position or heading to nearest suitable aerodrome or to reach nearest land.
 - c. Advise ATS of the progress of the recovery.
 - d. Advise ATS of any change of intentions.

8. Action by ATS. When notified that a flame-out recovery is required, ATS personnel should:
 - a. Advise other aircraft of the emergency in progress and keep them off the frequency being used by the aircraft in distress. If possible, avoid changing the frequency of the aircraft in distress once suitable contact is established (as detailed in STANAG 3642).
 - b. Inform the pilot in distress of the nearest and most suitable airfield, considering weather conditions (including winds), terrain and obstructions.
 - c. When practical, instruct the pilot not to acknowledge transmissions for which acknowledgement is not absolutely essential.
 - d. Co-ordinate actions with other ATS facilities as required and alert crash and rescue facilities.
 - e. If the pilot intends to carry out a flame-out procedure at an aerodrome, provide him with information regarding the runway in use, wind, altimeter setting and weather. Be as brief as possible and do not unnecessarily disturb the pilot, particularly in the final stages of an approach to land.
 - f. If the aircraft is over water, guide the pilot towards land as soon as possible. If over land, position the aircraft over the most favourable area for pilot survival.
 - g. Give the pilot in distress essential information upon which he can base his decisions, without volunteering courses of action.

9. Ejection. If ejection is elected, and time permits, the pilot should pass to ATS (immediately prior to ejection) aircraft heading and altitude. ATS should record this information and pass it immediately to the appropriate rescue facility.

METHODS OF FLAME-OUT RECOVERY

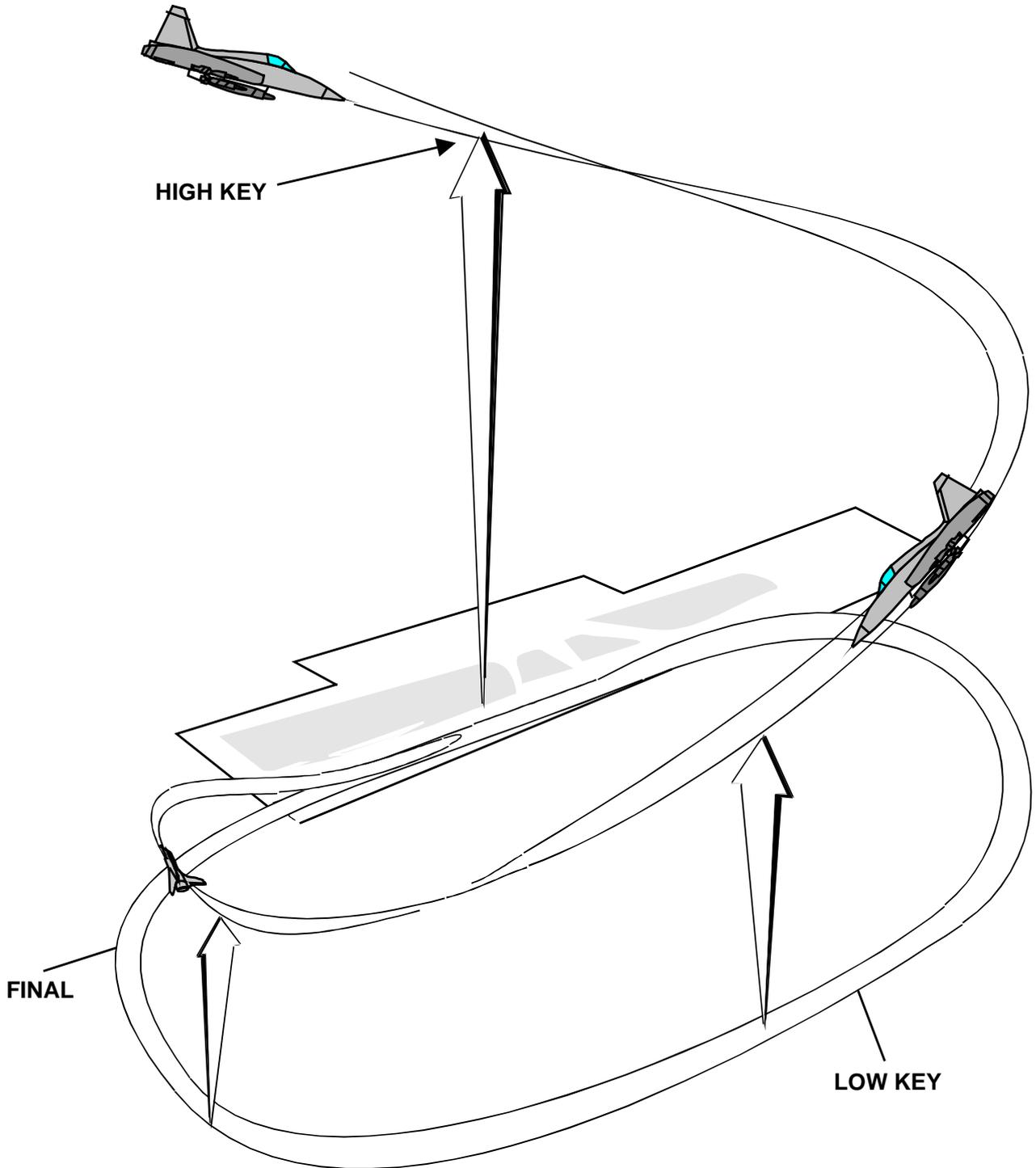
10. The initial actions of the pilot and ATS should be as described in paragraphs 7 and 8. Subsequently there are two commonly used recovery procedures, which are:

- a. Flame-Out Procedure. A flame-out procedure is a spiral descent in the airfield overhead in one of the following situations:
 - (1) VMC. If the pilot is in VMC the aircraft should be positioned overhead the airfield and descended in a spiral to land. If the pilot has requested a straight-in flame-out approach, the aircraft should be positioned so as to continue on a straight-in approach to land or for the most suitable runway at low key position. Conduct approaches in accordance with the patterns shown in Annexes A and B.
 - (2) IMC. If the pilot is in IMC or above cloud, positive direction from ATS is required to home the aircraft to overhead the airfield, and to initiate and maintain a spiral descent in the overhead until the pilot makes visual contact with the airfield. Thereafter, the pilot continues his spiral descent to land in accordance with Annex A.
- b. Radar Controlled Flame-out Procedure. A Radar Controlled Flame-out Procedure (RCFP) or one-in-one approach is a glide descent to a straight-in landing. Whether the pilot is in IMC or VMC, ATS should provide instructions to steer the aircraft to a position from which a straight-in landing can be made. Once identified, the pilot is given ranges at 1 nm intervals to a position overhead the airfield. Whilst gliding towards the airfield the pilot should compare his range with his height in thousands of feet and adjust his glide such that he is able, ultimately, to achieve a one-in-one glide slope (that is a loss of 1000 ft vertically for each 1 nm travelled horizontally). If the aircraft is particularly high in relation to the distance to run, the pilot may elect to deviate temporarily from his ideal track or carry out an orbit in order to achieve the required range/height relationship. Once the aircraft is established in the glide, that is the height in thousands of feet equates with the horizontal distance from the airfield in nautical miles, the pilot is to be passed range information at 0.5 nm intervals. On becoming visual with the airfield the pilot may elect to continue straight-in to land or position for the most suitable runway at low key position, as for a flame-out procedure.

IMPLEMENTATION OF THE AGREEMENT

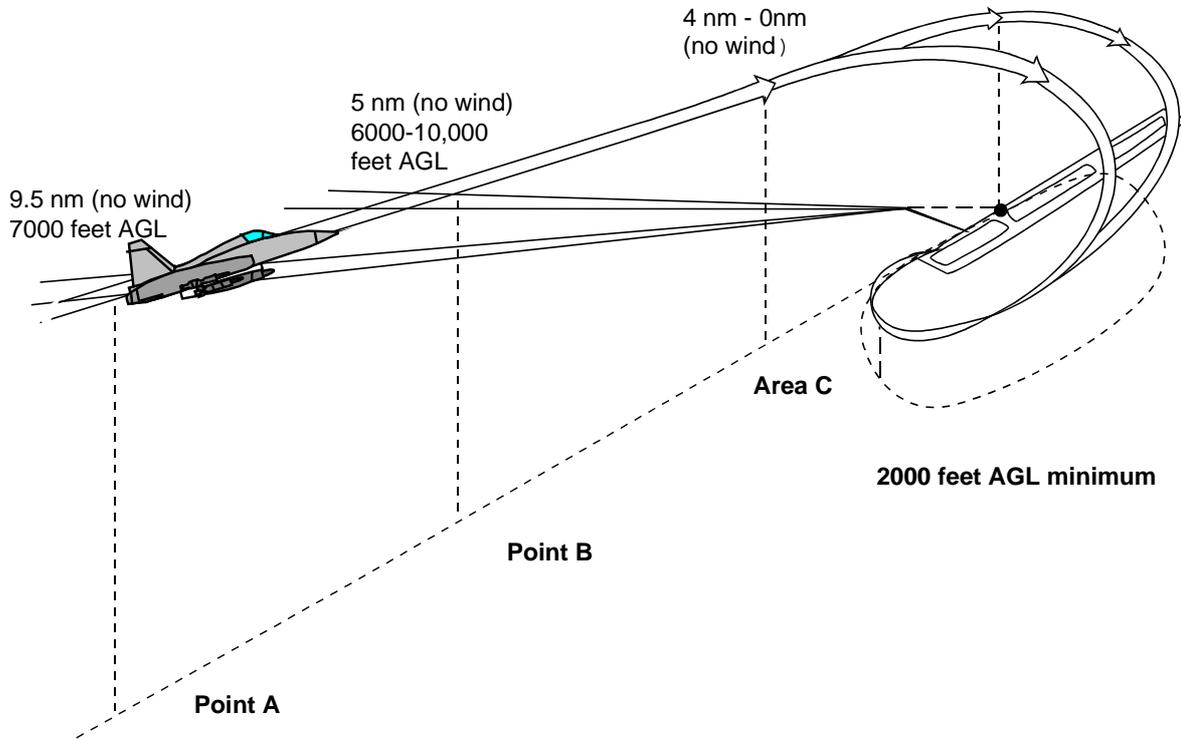
11. This STANAG is implemented when appropriate national ATS regulations or directives include the contents of this agreement.

TYPICAL OVERHEAD FLAME-OUT PATTERN - VMC



Note: Unless restricted by airfield regulation, break may be either left or right.

TYPICAL STRAIGHT IN FLAME-OUT PATTERN – VMC



Notes:

- Pilot has option to proceed to straight-in landing or fly a semi-level flight path to a circling approach.
- All depicted altitudes are approximate and dependent on aircraft type.
- Unless restricted by airfield regulations, break may be either left or right.