DVOR Rationalisation
Removal of Enroute Dependencies
GOW

DVOR GOW Holds and STARs Documentation: CAP1616 Stages 2-3 Multi-Gateway

V1.2

NATS Uncontrolled

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1.1	Aug 2019	Pg. 15 Annex B – procedure 5 GOW Hold, more detailed information provided Annex C – removed – not required as option is rejected Pg. 21 Annex D – further detail provided on GOW Hold amendments
1.2	Sep 2019	Pg. 11 Further details provided on airport engagement. Further details provided on formal NATMAC consultation.

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1. Introduction

This document continues the CAP1616 process started with the Statement of Need (DAP1916) submitted in April 2019. The intent of this document is to summarise and satisfy the requirements of CAP1616 Stages 2-3. The CAA reference is ACP-2019-26, the link to the CAA progress page is here.

This proposal is limited to removing the dependency of enroute instrument flight procedures in the UK AIP from the Glasgow (GOW) DVOR. Hence this proposal is focussed on Standard Terminal Arrival Routes (STARs), and their associated holds which refer to GOW as a conventional navaid in the enroute environment; where NATS is the primary air navigation services provider (ANSP).

This proposal contains the relevant changes to remove the dependency on GOW from these STARs and holds. Design Principles have been developed (Stage 1b) which are focused on best removing the enroute DVOR dependencies whilst ensuring the changes are safe and do not result in changes to flight behaviour. This document will identify:

- option concepts for replacing current connectivity relevant to GOW with RNAV procedures;
- an evaluation of those option concepts against the Design Principles;
- a full list of the specific changes.

2. Stage 2 Develop and Assess

Step 2A Options development

2.1 CAA's PBN STAR Replication Policy (V2) was published in Mar 2018 and was used as the basis for this proposal. It defines PBN STAR Replication as a PBN redesign of an existing conventional STAR from the commencement of the STAR in the ATS enroute network to the termination point with the intention of retaining the existing route and track over the ground (para 5.4). Para 5.5 of the same policy makes assumptions that replication ensures procedures follows the same path over the ground as the existing conventional procedure, as closely as possible. This means that there would be no change to pilot or controller behaviour (apart from technical designation changes), and no change to lateral or vertical traffic dispersion.

2.2 Airspace Change Design Options:
The Design Options considered to remove the enroute dependencies from GOW, were limited to the following:
Option 0 – Do nothing. Retain all the STARs and holds unchanged from today's AIP definition.
Option 1 – Using the CAA policies, replicate STARs/holds using RNAV, exactly as defined in the AIP without considering any practicalities.
Option 2 – Examine the use of existing STARS and holds from a practical point of view, re-evaluate how they are used and how the network may be improved by rationalising/truncating/replicating them in a considered manner.
Option 3 – Remove all existing STARs and holds that refer to or use the GOW DVOR.

The first DVOR proposals (SAM/ OCK/ GWC) contained three Design Options: do nothing; replicate all procedures; and lastly, examine all procedures and improve where appropriate (rationalise/ truncate/ replicate). These Design Options were accepted by the CAA. NATS was later requested to add an additional option to all future submissions, whereby all procedures with a dependency are removed; thus removing the DVOR dependency. The CAA acknowledged that this Design Option would never meet the Design Principles however, it should be included for completeness.

The Design Options have therefore been developed so they can be applied to each of the individual DVOR submissions and have evolved following guidance from the CAA. Appropriate engagement has previously been completed with NATMAC (National Air Traffic Management Advisory Committee) members (see 2.3); and airports will be fully briefed when their AIP pages require updating.

2.3 Stakeholder Engagement

As part of Stage 2, CAP1616 requires change sponsors to develop a comprehensive list of Design Options, which are tested with the same group of stakeholders who were engaged with during Stage 1. However, as covered in the Stage 1B Design Principles document (Ref 5), the DPs for this submission were not developed from stakeholder engagement. The engagement was completed with NATMAC in 2008; prior to the introduction of CAP1616 and the requirement to seek feedback on DPs.

Alongside the DPs, the Design Options have been developed to provide different methods in which the en-route dependencies can be removed from a DVOR, whilst ensuring no changes to flight behaviours. The Design Options have been used consistently across the numerous DVOR submissions as they achieve the same outcome; although they are always reviewed to ensure relevance. We therefore conclude that there is no need to re-consult with the NATMAC members, nor any additional stakeholders, as there will not be any impact upon them.

However, as part of this Airspace Change Proposal, NATS has been in contact with relevant airfields which use the STARs and associated Holds we plan to RNAV. These airfields will need to update relevant sections of their AIP. This engagement has allowed us to inform them of this. The proposed changes have been designed to be invisible from an airport's perspective so there are no other impacts anticipated. There has also been engagement with Airlines including involvement in validation of the flyability of the proposed procedures.

Step 2A Options Development: Design Principle Evaluation

This section evaluates the performance of all 4 Design Options with respect to each Design Principle. The Design Principles developed during Stage 1 are included in Appendix A for reference.

2.3 Option 0 – Do nothing

Retain all the STARs and holds unchanged from today's AIP definition.

2.4 See the submitted Stage 1 Assessment Meeting slidepack [ref 1] for the detail of the 18 procedures which reference GOW on their charts; and which would remain as is for this option. The table below presents an evaluation of this option against the Design Principles:

Option 0			REJECT
Description of option			
This is the current scenario. No change to existing AIP definitions of STARs or holds.			
Design Principle 0: Maintain or enhance the current level of safety			MET
Summary of qualitative assessment No change; the level of safety is maintained.			
Design Principle 1: No change to flight behaviours			MET
Summary of qualitative assessment No change to lateral/vertical track patterns.			
Design Principle 2: Administrative change	NOT MET		
Summary of qualitative assessment No administrative changes would take place under this Design Option. Does not remove any enroute flight dependency from the GOW DVOR.			
Design Principle 3: Withdraw unnecessary STARs	NOT MET		
Summary of qualitative assessment No withdrawals would take place under this Design Option. Does not remove any enroute flight dependency from the GOW DVOR.			
Design Principle 4: Replicate using RNAV Replication policies	NOT MET		
Summary of qualitative assessment No replication would take place under this Design Option. Does not remove any enroute flight dependency from the GOW DVOR.			
Design Principle 5: Technical amendment	NOT MET		
Summary of qualitative assessment No technical amendments would take place under this Design Option. Does not remove any enroute flight dependency from the GOW DVOR.			

2.5 Option 1 – Replicate each STAR/Hold with a GOW dependency, exactly as defined today.

Replace GOW DVOR/DME with GOW DME.

This option would replace all dependent procedures identified in the Assessment Meeting slidepack[ref 1] as RNAV procedures. This table evaluates this option against the Design Principles:

Option 1			REJECT
Description of option			
All IFPs would be replicated exactly as defined in the current AIP. No account would be taken of actual usage, route segment duplication, or other factors.			
Design Principle 0: Maintain or enhance the current level of safety			MET
Summary of qualitative assessment IFPs replicated as RNAV5 procedures. The level of safety is maintained or slightly improved due to increased precision.			
Design Principle 1: No change to flight behaviours			MET
Summary of qualitative assessment No practical change to connectivity, no change to lateral/vertical track patterns.			
Design Principle 2: Administrative change	NOT MET		
Summary of qualitative assessment No administrative changes would take place under this Design Option; including changes which would logically improve the ATS route network.			
Design Principle 3: Withdraw unnecessary STARs			MET
Summary of qualitative assessment This Design Option would remove the need for contingency conventional-navigation STARs/holds based on other navaids; such IFPs could be withdrawn.			
Design Principle 4: Replicate using RNAV replication policies			MET
Summary of qualitative assessment This Design Option would purely replace like for like, including route segment duplications etc. Therefore, this Design Principle would be satisfied.			
Design Principle 5: Technical amendment	NOT MET		
Summary of qualitative assessment No technical amendments would take place under this Design Option.			

Option 2 – Evaluate each STAR and hold as used in practice, replicate as appropriate

This option evaluates the usage of each procedure individually and creates opportunity bespoke to specific procedures. See Annex B for the detailed change for each of the procedures under this option.

This table evaluates this option against the Design Principles:

Option 2			ACCEPT and PROGRESS
Description of option			
Examine the use of existing STARs and holds from a practical point of view, re-evaluate how they are used and how the network may be improved by rationalising/truncating/replicating them in a considered manner.			
Design Principle 0: Maintain or enhance the current level of safety			MET
Summary of qualitative assessment IFPs replicated as RNAV5 procedures. The level of safety is maintained or slightly improved due to increased precision. Procedures can be simplified depending on actual usage today.			
Design Principle 1: No change to flight behaviours			MET
Summary of qualitative assessment No practical change to connectivity, no change to lateral/vertical track patterns.			
Design Principle 2: Administrative change			MET
Summary of qualitative assessment Evaluate current STARs and holds, and identify where this Design Principle applies. Rename STAR designations in line with the current ICAO policy. For example, this Design Option allows the Glasgow LANAK 2D STAR to be renamed as AGPED 1G; with AGPED as the starting waypoint and the 'G' Identifier to denote the destination airport.			
Design Principle 3: Withdraw unnecessary STARs			MET
Summary of qualitative assessment Evaluate current IFPs and identify where this Design Principle applies. Analysis of flight planning history would reveal actual usage, compare with STARs performing similar function and connectivity. For example, this Design Option allows the Edinburgh EDN 1D STAR to be withdrawn as it will otherwise become redundant once the GOW STARs are RNAV'd.			
Design Principle 4: Replicate using RNAV Replication policies			MET
Summary of qualitative assessment Evaluate current IFPs and identify where this Design Principle applies. Several IFPs would satisfy this Design Principle. For example, this Design Option allows the Edinburgh/Glasgow STAR STIRA 1A to be RNAV5 replicated and renamed as PTH 1S.			
Design Principle 5: Technical amendment			MET
Summary of qualitative assessment Evaluate current STARs and holds and identify where this Design Principle applies. Some IFPs would satisfy this Design Principle. For example, this Design Option allows the STAR LANAK 2A to be re-designated as RIBEL 1G with new 5LNC VAPPI for PFS30 and additional waypoint NISKA added.			

2.6 Option 3 – Remove all existing IFPs with a GOW dependency

This option removes each STAR and Hold with a GOW dependency, and replaces GOW DVOR/DME with GOW DME. See Annex C for the detailed change for each of the procedures under this option.

This table evaluates this option against the Design Principles:

Option 3	REJECT		
Description of option			
Remove all existing STARs and holds for which the GOW DVOR is materially important.			
Design Principle 0: Maintain or enhance the current level of safety	NOT MET		
Summary of qualitative assessment The removal of these procedures would create a gap in the network. This would require all aircraft currently using the existing IFPs to be channelled into other, potentially busy flows/ sectors, which could greatly increase controller workload in those areas.			
Design Principle 1: No change to flight behaviours	NOT MET		
Summary of qualitative assessment Aircraft would not be able to use the current procedures, causing a change in flight behaviours to work around this.			
Design Principle 2: Administrative change	NOT MET		
Summary of qualitative assessment No administrative changes would take place under this Design Option; including changes which would logically improve the ATS route network.			
Design Principle 3: Withdraw unnecessary STARs			MET
Summary of qualitative assessment This Design Option would remove all STARs: both necessary and unnecessary.			
Design Principle 4: Replicate using RNAV Replication policies	NOT MET		
Summary of qualitative assessment No replication would take place under this Design Option.			
Design Principle 5: Technical amendment	NOT MET		
Summary of qualitative assessment No technical amendments would take place under this Design Option.			

2.7 Summary – Options Development

Using the Design Principles, we have evaluated the four concept Design Options, as summarised above.

2.8 *Design Option 0: Do Nothing* – this does not achieve the removal of dependencies from GOW. **Rejected.**

2.9 *Design Option 1: Replicate as defined* – this achieves the removal of dependencies from GOW. However, it does not improve network connectivity; it leaves route segment duplication in place and it does not account for current usage levels. **Rejected.**

2.10 *Design Option 2: Evaluate each STAR and hold as used in practice* – achieves the removal of dependencies from GOW. This improves overall network connectivity, reduces duplication, and accounts for current usage levels. **Accepted and progressed.**

2.11 *Design Option 3: Remove all existing STARs and holds that refer to or use the GOW DVOR* - this technically would remove the dependencies from GOW; however, it removes STARs and holds that are used and needed by aircraft today and going forward. **Rejected**

Conclusion: The Design Option 2 concept best meets all of the Design Principles. The shortlist comprises the Option 2 concept only. The other three option concepts are therefore not progressed.

Step 2A complete

Step 2B Options appraisal

2.12 The baseline (do nothing) option does not achieve the removal of dependencies from GOW. The ratings for the baseline option against each of the Design Principles shows that whilst it maintains safety levels and creates no change to flight behaviours, it does not meet the remaining 4 DPs.

2.13 Following the Design Principle evaluation, we conclude that the following Design Option 2 could be used to remove the dependencies from the GOW DVOR, in accordance with the Design Principles:

> *Evaluate each STAR and hold as used in practice – achieves the removal of dependencies from GOW. This improves overall network connectivity, reduces duplication, and accounts for current usage levels.*

2.14 There would be no change in fuel/CO_2/greenhouse gas emissions due to this proposal because there would be no change to lateral or vertical tracks. Fuel uplift changes are unlikely to occur. There are no costs or benefits which could be reasonably monetised due to this enroute proposal.

2.15 Safety Assessment: The Design Option 2 concept takes full account of existing usage and connectivity needs. All new IFPs would be designed by an APD, as regulated by CAA SARG. There would be a qualitative improvement in safety because each replicated IFP would use improved PBN navigation specifications and be validated by CAA SARG. Today's conventional IFPs are known to be flown using FMS overlays, which are not state-regulated or validated.

2.16 GOW Option 2 – Evaulate each STAR and Hold as used in practice

The CAP1616 Appendix E cost/benefit analysis is given below.

Group	Impact	Level of Analysis	Evidence
Communities	Noise impact on health and quality of life	N/A	As there are no proposed changes to lateral or vertical tracks there will be no impact on noise or quality of life.
Communities	Air quality	N/A	No changes below 1,000ft
Wider society	Greenhouse gas impact	Monetise and quantify	No proposed changes to lateral or vertical tracks so no impact
Wider society	Capacity/ resilience	Qualitative	No changes
General Aviation	Access	N/A	No changes
General Aviation/ commercial airlines	Economic impact from increased effective capacity	Quantify	No changes
General Aviation/ commercial airlines	Fuel burn	Monetise	No proposed changes to lateral or vertical tracks so no impact
Commercial airlines	Training cost	N/A	N/A – there is not expected to be any airline training cost.
Commercial airlines	Other costs	N/A	Updates to FMS and flight planning systems will completed via the routine AIRAC updates. There are no other known costs which would be imposed on commercial aviation.
Airport/ Air navigation service provider	Infrastructure costs	Qualitative and quantitative	The cost of implementation of the change, adaptation of systems is estimated to be approx. £65,000.
Airport/ Air navigation service provider	Operational costs	N/A	N/A – this proposal would not lead to changes in operational costs.
Airport/ Air navigation service provider	Deployment costs	Qualitative and quantitative	N/A – this change would be introduced via briefings and bulletins for staff, with no additional training or simulation training/costs required.

2.17 Conclusion: There would be a positive impact on safety whilst also improving the overall network connectivity.

End of Step 2B

3. Stage 3 Consult

Steps 3A-3D

3.1 Consultation is mainly about explaining differences in impacts, and how that may affect a stakeholder.

3.2 The draft consultation strategy is "*consultation is not required, by design*". There would be no impact to people on the ground, nor to aviation stakeholders; beyond typical AIRAC updates with technical changes (AIRAC changes are a "day job" for an air operator). This project was organised to be a technical piece of work, and there would be no noticeable impacts, leading to no material change to the current operation.

3.3 In order to provide full transparency, NATS has positively engaged with all relevant airports (Glasgow and Edinburgh) which will need to administratively update their AIP sections, in order to refer to GOW DME. This engagement has been face to face briefings, with follow up emails sent to Glasgow and Edinburgh ATC, to inform stakeholders of the proposed changes and seek any initial feedback in relation to this.

3.4 Further planned engagement includes attendance at FLOPSC (Flight Ops Committee) meetings (date TBC) at both Glasgow and Edinburgh to present the new STAR plates. RyanAir have been briefed in person. This engagement will be captured from the minutes of FLOPSC meetings and from response emails.

3.5 Draft consultation document: not required, all the practical impacts of Option 2 have been assessed and there are none, except for technical network improvements. Consultation would serve no practical purpose.

3.6 Full options appraisal: unchanged from the Stage 2 options appraisal, see Section 2.16.

3.7 In 2008, a CAA-led consultation provided NATMAC members with a consultation paper which outlined NATS plans to rationalise the DVOR infrastructure; alongside being invited to provide feedback or questions on the proposal.

3.8 A follow-up informative letter was sent to NATMAC members in 2010 which summarised the results of the consultation; including broad support from airlines and a recognised requirement for airports to remove their own airport procedure dependencies. NATS, through the DVOR Rationalisation Project, also provided the NATMAC members with an update on the project in 2018; including an explanation of the stages required to remove the navaid dependencies and how they will be physically removed from service.

3.9 NATS formally notified all airports in 2018, which have AIP-published procedures using the relevant DVORs, that they are required to remove all dependencies by December 2022. This gave airports a four-year notice period to carry out the CAP1616 ACP work required to remove their own dependencies. Airports were given the opportunity to formally request an extension to this period if they wish to rely on a DVOR beyond December 2022.

3.10 NATS requests the CAA acknowledge that Stage 3 is either hereby satisfied, or not required due to the previous CAA consultation.

3.11 NATS requests the CAA acknowledge that Stage 3 is either hereby satisfied, or not required due to the previous CAA consultation.

End of Steps 3A-3D

4. Summary

4.1 This document details the STARs and Holds where the GOW DVOR is material to the instrument flight procedure. It describes the current connectivity; the method used to progress the change; and the proposed connectivity.

4.2 Some minor administrative changes to other STARs and holds are included, in order to improve the consistency of charts within the AIP and to follow CAA/ICAO guidance on the naming of STARs.

4.3 The proposed connectivity remains entirely unchanged due to RNAV5 replication, with or without appropriate truncation/ATS route extension.

- routes are unchanged
- connectivity is unchanged
- hence flight behaviours and traffic patterns over the ground are unchanged.

4.4 Annexes C-E below detail the IFP changes we are proposing to make in support of removing the GOW DVOR enroute dependency and rationalisation of the network, summarised in this table:

- Edinburgh/Glasgow: 1 STAR to RNAV replicate and 1 Hold to RNAV replicate.
- Glasgow: 3 STARs to RNAV replicate (1 with extension);
  3 Holds to RNAV replicate;
  2 STARs with administrative changes (renaming to ICAO conventions);
  1 Hold to withdraw;
  6 STARs to withdraw.
- Edinburgh: 1 STAR to withdraw.

5. Conclusion

5.1 We have assessed that there are no foreseen impacts of making the proposed changes described in the tables below, and conclude that making these technical changes to the procedures would not alter traffic patterns.

6. Annex A – Design Principles

6.1 Design Principles for GOW DVOR (as per Stage 1B)

Design Principle	Description
DP0 Safety	Airspace change must maintain or enhance the current level of safety
DP1 No change to flight behaviour	None of the proposed technical changes to definitions of STARS/holds would result in a change to actual flight behaviours – laterally, vertically or in dispersal
DP2 Admin	Remove unnecessary references to the GOW DVOR which are not material to the procedure
DP3 Withdraw	Some STARs are rarely used, some do the same job, some have segments in common with other STARs
DP4 Replicate	PBN Replication – replace conventional STARs/Holds with RNAV STARs/Holds
DP5 Technical amendment	Minor changes to a STAR which currently cannot be flown as it is formally defined, for legacy reasons – these changes always reflect what would actually happen in practical terms.

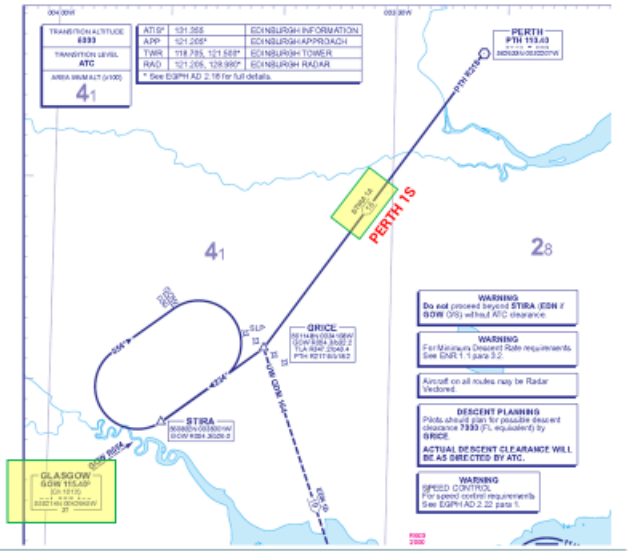
7. Annex B – Design Option 2: Procedure Detail

This section demonstrates the proposed changes for Design Option 2: Evaluate each STAR and hold individually and use replication where appropriate.

Concept Option 2:
Evaluate each IFP individually and use replication where appropriate

The following Edinburgh/ Glasgow Hold currently refers to the GOW VOR.

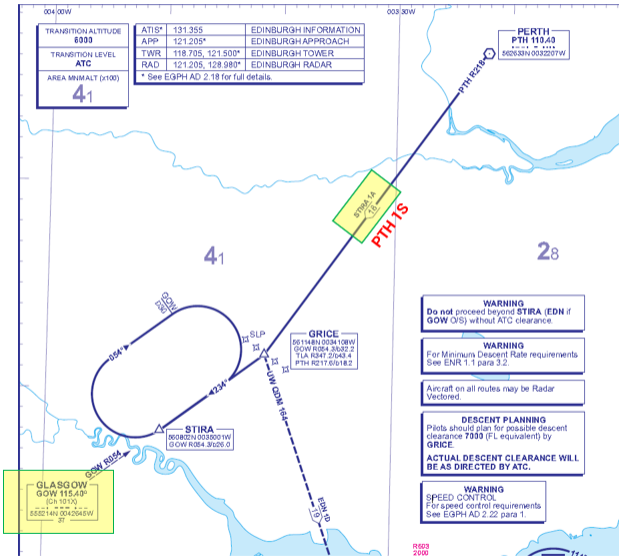
1) **STIRA Hold** this will be RNAV'd and replicate the current published conventional STIRA hold.



Concept Option 2:
Evaluate each IFP individually and use replication where appropriate

The following Edinburgh/ Glasgow STAR currently refers to the GOW VOR. After discussion with the CAA, STARs are to be re-designated based on their start points as well as the destination airport suffix.

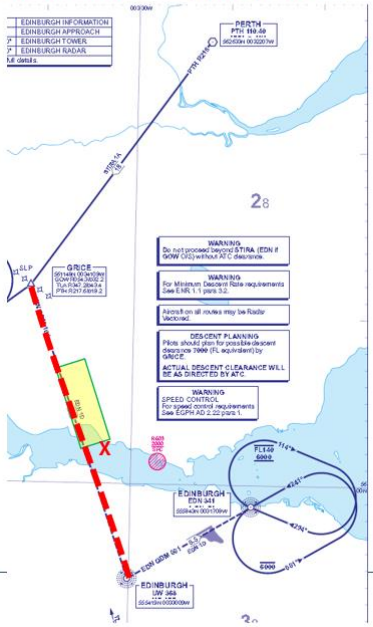
2) **STIRA 1A** to be replicated as **PTH 1S**



Concept Option 2:
Evaluate each IFP individually and use replication where appropriate

The following Edinburgh STAR currently refers to the GOW VOR.

3) EDN 1D to be withdrawn. This STAR is currently for when GOW is OOS so is no longer required.

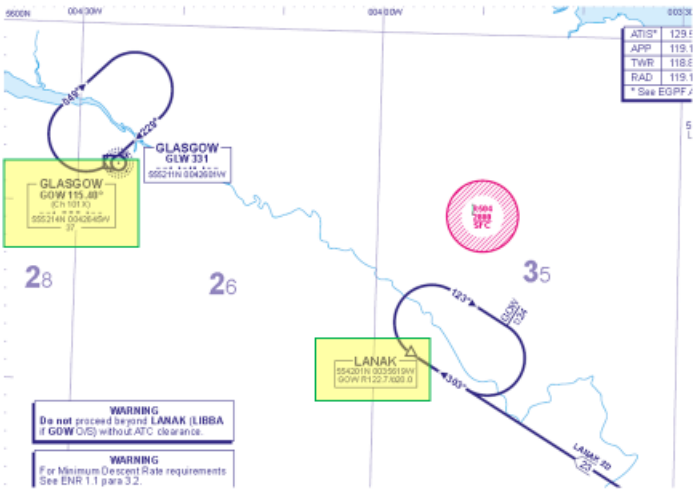


Concept Option 2:
Evaluate each IFP individually and use replication where appropriate

The following Glasgow Holds currently refer to the GOW VOR.

4) **LANAK** Hold – this will be RNAV'd and replicate the current published conventional LANAK hold.

5) **GOW** Hold to be withdrawn from the STAR chart. The Hold will still exist but only as an arrival procedure to 6,000ft, it is not required above this level.

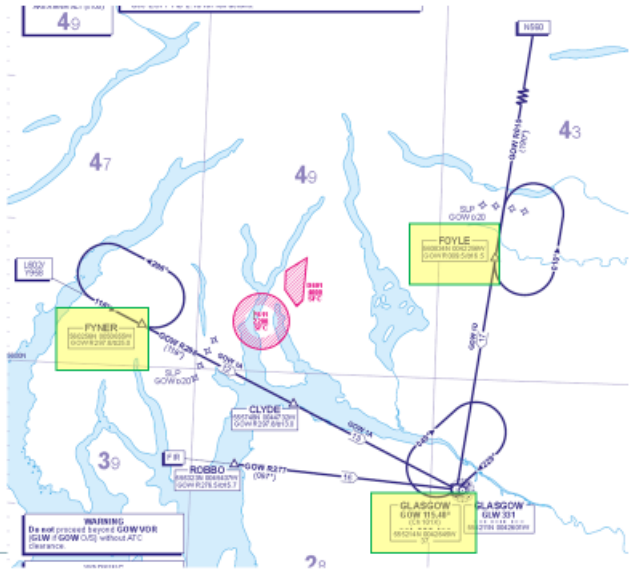


Concept Option 2:
Evaluate each IFP individually and use replication where appropriate

The following Glasgow Holds currently refer to the GOW VOR.

6) **FOYLE** Hold – this will be RNAV'd and replicate the current published conventional FOYLE hold.

7) **FYNER** Hold – this will be RNAV'd and replicate the current published conventional FYNER hold.



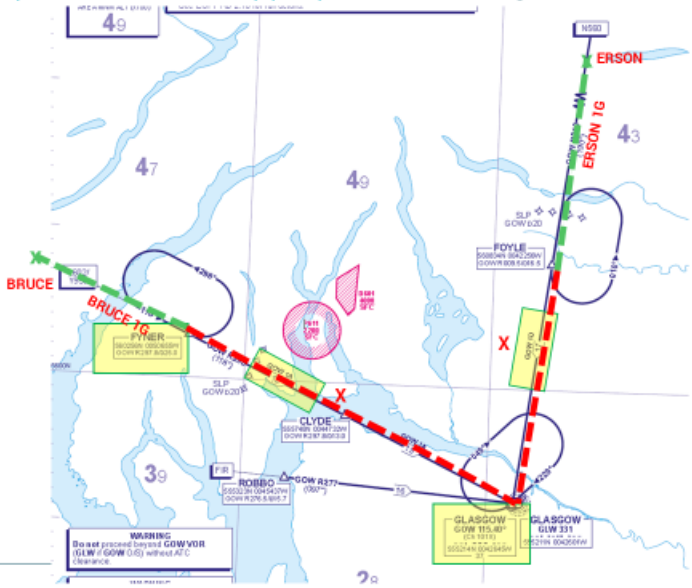
NATS Unclassified

Concept Option 2:
Evaluate each IFP individually and use replication where appropriate

The following Glasgow STARs currently refer to the GOW VOR. After discussion with the CAA, STARs are to be re-designated based on their start points as well as the destination airport suffix.

8) GOW 1A to be replaced with new STAR **BRUCE 1G** with route connectivity via L602/Y958 of: BRUCE - FYNER

9) GOW 1D to be replaced with new STAR **ERSON 1G** with route connectivity via N560 of: ERSON - FOYLE



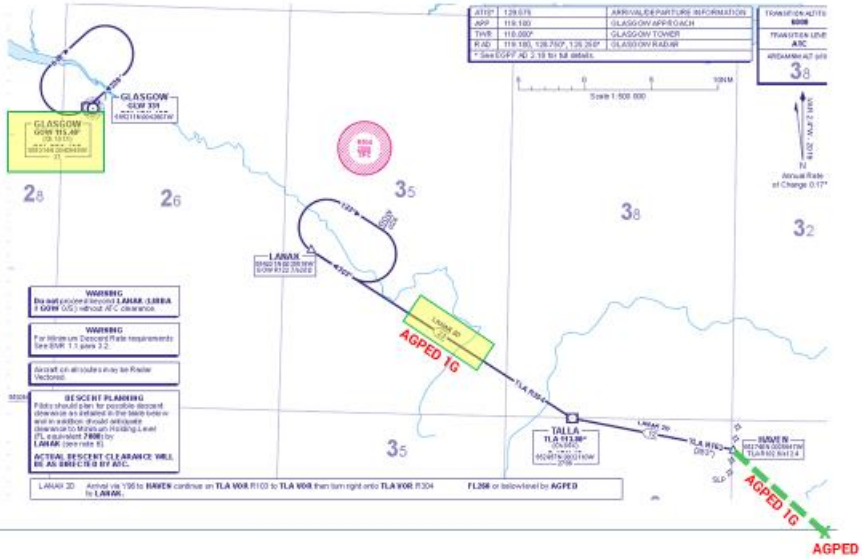
NATS Unclassified

Concept Option 2:
Evaluate each IFP individually and use replication where appropriate

The following Glasgow STAR currently refers to the GOW VOR.

After discussion with the CAA, STARs are to be re-designated based on their start points as well as the destination airport suffix.

10) LANAK 2D to be replicated as **AGPED 1G** with extension to AGPED.



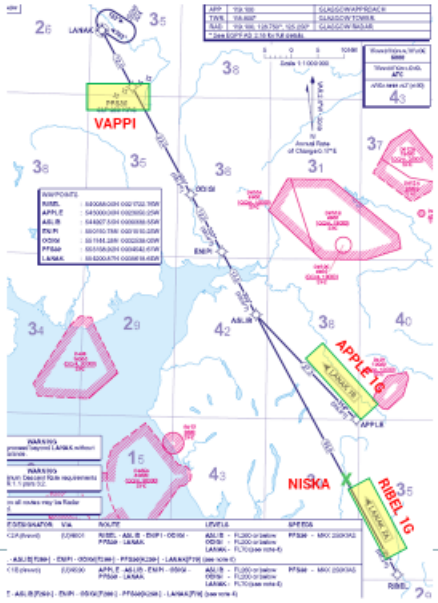
Concept Option 2:
Evaluate each IFP individually and use replication where appropriate

The following Glasgow STARs feature on the same chart as the GOW VOR and have also been evaluated as part of this proposal.

After discussion with the CAA, STARs are to be re-designated based on their start points as well as the destination airport suffix.

11) LANAK 2A (RNAV) to be re-designated as **RIBEL 1G** with new 5LNC VAPPI for PFS30 and additional waypoint NISKA added.

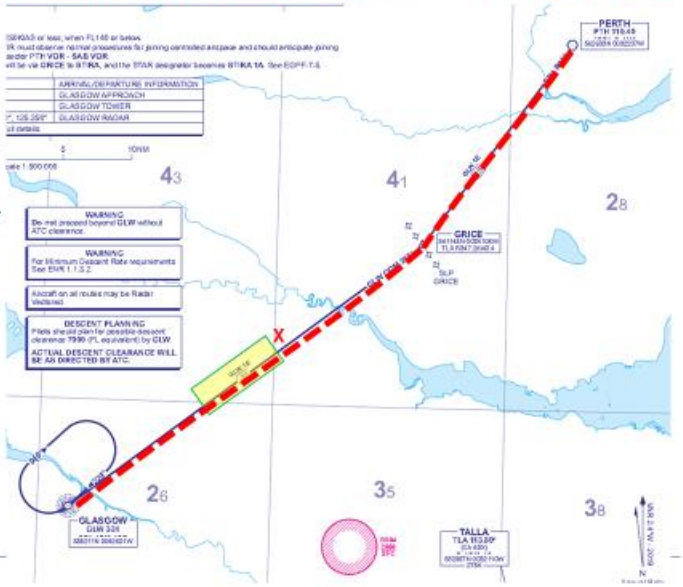
12) LANAK 1B (RNAV) to be re-designated as **APPLE 1G** with new 5LNC VAPPI for PFS30



Concept Option 2:
Evaluate each IFP individually and use replication where appropriate

The following Glasgow STARs feature on the same chart as the GOW VOR and have also been evaluated as part of this proposal.

13) GLW 1E to be withdrawn. This STAR is currently for when GOW is OOS so is no longer required.



Concept Option 2:
Evaluate each IFP individually and use replication where appropriate

The following Glasgow STARs feature on the same chart as the GOW VOR and have also been evaluated as part of this proposal.

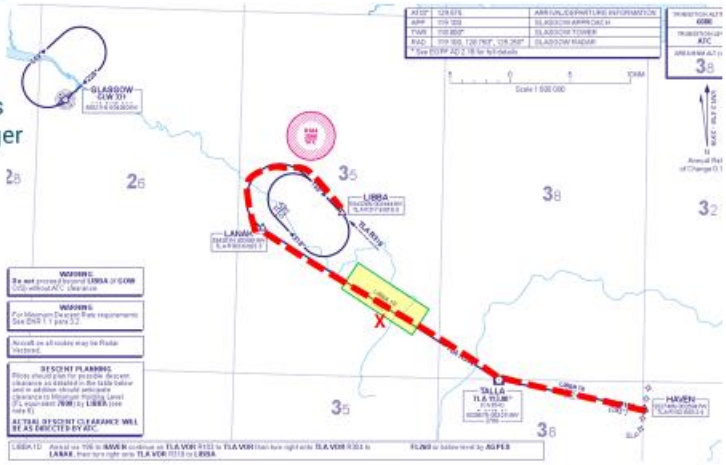
14) LIBBA 2A to be withdrawn. This STAR is currently for when GOW is OOS so is no longer required.

15) LIBBA 1B to be withdrawn. This STAR is currently for when GOW is OOS so is no longer required.

Concept Option 2:
Evaluate each IFP individually and use replication where appropriate

The following Glasgow STARs feature on the same chart as the GOW VOR and have also been evaluated as part of this proposal.

16) LIBBA 1D to be withdrawn. This STAR is currently for when GOW is OOS so is no longer required.

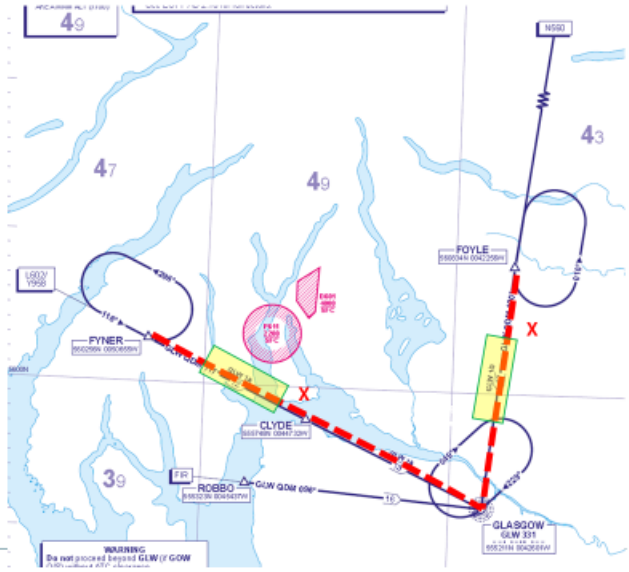


Concept Option 2:
Evaluate each IFP individually and use replication where appropriate

The following Glasgow STARs feature on the same chart as the GOW VOR and have also been evaluated as part of this proposal.

17) GLW 1A to be withdrawn. This STAR is currently for when GOW is OOS so is no longer required.

18) GLW 1D to be withdrawn. This STAR is currently for when GOW is OOS so is no longer required.



8. Annex C Impact assessment – Edinburgh/Glasgow Holds and STARs

For charts and technical notes see the Assessment Meeting slidepack [Ref 1] for the current IFPs. Annex B shows the proposed changes.

Current IFP	Current route connectivity/STAR	Design Principle	How	Proposed route Connectivity/STAR	Impact of proposed change on connectivity Impact of proposed change on flight behaviour
STIRA HOLD	*N/A*	4 Replicate	RNAV5 replication	Not required	Same, no impact to connectivity. No predicted change to flight behaviour.
STIRA 1A	P600: *PTH VOR – GRICE - STIRA*	4 Replicate 2 Admin	RNAV5 replication	*P600: PTH VOR – GRICE – STIRA Rename as PERTH 1S*	Same, no impact to connectivity. No predicted change to flight behaviour. 'S' Identifier used in order to adhere to the CAA request of naming the Route Indicator after the destination airport.

9. Annex D Impact assessment – Edinburgh Holds and STARs

For charts and technical notes see the Assessment Meeting slidepack [Ref 1] for the current IFPs. Annex B shows the proposed changes.

Current IFP	Current route connectivity/STAR	Design Principle	How	Proposed route Connectivity/STAR	Impact of proposed change on connectivity Impact of proposed change on flight behaviour
EDN 1D	P600: *PTH VOR – GRICE – NDB(L) – NDB(L) EDN*	3 Withdraw	Not required	Not required	This STAR is currently for when GOW is OOS so is no longer required. No predicted change to flight behaviour.

10. Annex E Impact assessment – Glasgow Holds and STARs

For charts and technical notes see the Assessment Meeting slidepack [Ref 1] for the current IFPs. Annex B shows the proposed changes.

Current IFP	Current route connectivity/STAR	Design Principle	How	Proposed route Connectivity/STAR	Impact of proposed change on connectivity Impact of proposed change on flight behaviour
LANAK Hold	*N/A*	4 Replicate	RNAV5 replication	Not required	Same, no impact to connectivity. No predicted change to flight behaviour.
GOW Hold	*N/A*	3 Withdraw	Withdrawn from 6,000ft, removed from STAR chart but kept in AD 2.22 for inbounds.	Not Required	The GOW Hold is not being withdrawn at all levels, only within NERL airspace. It will still exist at 6,000 ft and below for Glasgow procedures that require it. With this ACP there are no NERL procedures that require the GOW Hold. No predicted change to flight behaviour.
FOYLE Hold	*N/A*	4 Replicate	RNAV5 replication	Not required	Same, no impact to connectivity. No predicted change to flight behaviour.
FYNER Hold	*N/A*	4 Replicate	RNAV5 replication	Not required	Same, no impact to connectivity. No predicted change to flight behaviour.
LANAK 2D STAR	Y96: *HAVEN – TLA VOR - LANAK*	2 Admin 4 Replicate	RNAV5 replication, extend STAR to start at AGPED to accommodate level restrictions.	Y96: *AGPED – HAVEN – TLA VOR – LANAK* *Rename as AGPED 1G*	Same, no impact to connectivity. No predicted change to flight behaviour. 'G' Identifier used in order to adhere to the CAA request of naming the Route Indicator after the destination airport (G - Glasgow).
GOW 1A STAR	L602, Y958: *FYNER – CLYDE – GOW VOR*	2 Admin 6 Technical	Replace with RNAV5 STAR to start at BRUCE.	L602, Y958: *BRUCE – FYNER* *Rename as BRUCE 1G*	Same, no impact to connectivity. No predicted change to flight behaviour. 'G' Identifier used in order to adhere to the CAA request of naming the Route Indicator after the destination airport (G – Glasgow).

Current IFP	Current route connectivity/STAR	Design Principle	How	Proposed route Connectivity/STAR	Impact of proposed change on connectivity Impact of proposed change on flight behaviour
GOW 1D STAR	N560: *FOYLE – GOW VOR*	2 Admin 6 Technical	Replace with RNAV5 STAR to start at ERSON.	N560: *ERSON – FOYLE* *Rename as ERSON 1G*	Same, no impact to connectivity. No predicted change to flight behaviour. 'G' Identifier used in order to adhere to the CAA request of naming the Route Indicator after the destination airport (G – Glasgow).
LANAK 1B	(U)N590: *APPLE – ASLIB – ENIPI – ODIGI – PFS30 - LANAK*	2 Admin	Same (already RNAV5), with new 5LNC VAPPI for PFS30	Same - rename as APPLE 1G	Same, no impact to connectivity. No predicted change to flight behaviour. 'G' Identifier used in order to adhere to the CAA request of naming the Route Indicator after the destination airport (G – Glasgow).
LANAK 2A	(U)N601: *RIBEL – ASLIB – ENIPI – ODIGI – PFS30 - LANAK*	2 Admin	Same (already RNAV5), with new 5LNC VAPPI for PFS30; additional waypoint NISKA added.	Same - rename as RIBEL 1G	Same, no impact to connectivity. No predicted change to flight behaviour. 'G' Identifier used in order to adhere to the CAA request of naming the Route Indicator after the destination airport (G – Glasgow).
LIBBA 1B	(U)N590: *APPLE – ASLIB – ENIPI – ODIGI – PFS30 – LANAK - LIBBA*	3 Withdraw	Not Required	Not Required	This STAR is currently for when GOW is OOS so is no longer required. No predicted change to flight behaviour.
LIBBA 2A	(U)N601: *RIBEL – ASLIB – ENIPI – ODIGI – PFS30 – LANAK - LIBBA*	3 Withdraw	Not Required	Not Required	This STAR is currently for when GOW is OOS so is no longer required. No predicted change to flight behaviour.
GLW 1A	L602, Y958: *FYNER – CLYDE – NDB GLW*	3 Withdraw	Not Required	Not Required	This STAR is currently for when GOW is OOS so is no longer required. No predicted change to flight behaviour.
GLW 1D	N560: *FOYLE – NDB GLW*	3 Withdraw	Not Required	Not Required	This STAR is currently for when GOW is OOS so is no longer required. No predicted change to flight behaviour.

Current IFP	Current route connectivity/STAR	Design Principle	How	Proposed route Connectivity/STAR	Impact of proposed change on connectivity Impact of proposed change on flight behaviour
LIBBA 1D	Y96, Y958: *FYNER – CLYDE – NDB GLW*	3 Withdraw	Not Required	Not Required	This STAR is currently for when GOW is OOS so is no longer required. No predicted change to flight behaviour.
GLW 1E	P600: *PTH VOR – GRICE – GLW NDB*	3 Withdraw	Not Required	Not Required	This STAR is currently for when GOW is OOS so is no longer required. No predicted change to flight behaviour.

11. Annex F List of references

Reference	Title and description
1 For publication	*L4017-GOW-DVOR-CAP1616-Stage 1 Assessment Meeting V1.1 (Redacted)* Slide pack presented at the Stage 1 Assessment Meeting; annotated and redacted for publication. This is the primary reference material for illustrations of baseline IFPs in this multi-gateway document. Link to document on portal.
2 Not for publication	*DVOR Rationalisation TRN and GOW Draft PDG Report* This PDF summarises the draft IFP data pack which will be supplied to CAA IFP Regulator for ICAO PANS-OPS compliance analysis. This is part of a technical piece of work in the context of IFP Regulation. It contains NATS IPR and is not expected to be published on the CAA's portal.
3 For publication	GOW DVOR Assessment Meeting minutes (redacted) Link to document on portal.
4 For publication	DAP1916 GOW DVOR Statement of Need Link to document on portal.
5 For publication	L4017-GOW-DVOR-CAP1616 Stage 1b Design Principles V1.1 Link to document on portal.

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