

FIHA AD2SUPP YBOK Temporary Amendment 01/24

RQ7-B Shadow Operations at YBOK

1 Purpose

This FIHA AD2 SUPP YBOK amendment sets out the procedures for the operation of the RQ7-B Shadow (Shadow) at YBOK. The Shadow is *not* equipped with an approved navigation system for the purpose of the Manual of Air Traffic Services (MATS) 5.3.3.1, and 44WG SI (OPS) 03-09 paragraph 4 requires that the operation of large RPAS (greater than 150kg) is to be subject to an individual Air Traffic Management Plan.

The Shadow Air Traffic Management plan (ATMP) specifies the minimum separation required between Shadow and other UAS and crewed aircraft. The standards specified in this instruction meet or exceed those specified in the ATMP.

See [Shadow UAS Air Traffic Management Plan \(Shadow ATMP\)](#)

2 Implementation

2.1.1 Flight Planning

Air Traffic Control (ATC) will create a local flight plan for each sortie promulgated in FLYPRO.

2.1.2. Callsign

Shadow will utilise the callsign SPEARGUN (SPGN) in conjunction with the last two digits of the aircraft tail number.

2.1.3. Transponder Codes.

Shadow shall utilise SSR code 6500, 6501, 6502 or 6503 for each sortie. The preferred code shall be annotated on FLYPRO. During normal operation, Shadow is capable of changing SSR codes once airborne.

2.1.4 Priority

Crewed aircraft will have priority over Shadow with the following exceptions:

Shadow operations established inside ROZ shadow;

Emergency operations, such as Shadow lost-link procedures; or,

When additional delays will prevent Shadow from recovering within promulgated ATS hours.

2.1.5 Flight Rules

Shadow cannot fully comply with the requirements of either Visual Flight Rules (VFR) or Instrument Flight Rules (IFR).

IAW [HQ AVN COMD SFI 02/2020](#) Shadow may operate in Special VFR conditions when authorised, provided the visibility is not less than 3000m.

2.1.6 Separation

Separation is to be applied between Shadow and crewed aircraft as described below. Where separation is not possible, segregation by exclusion must be implemented between crewed aircraft and the Shadow's operating area. Where practicable, separation is preferred so as to not restrict crewed aircraft from accessing the airspace volumes detailed below.

If ROZs are not created to effect segregation, then Shadow operations are to be constrained by the separation standards defined below.

Note: Roz SHADOW provides the required segregation with class G airspace. None of the ROZs established in this document (SHADOW, TALS and LADDER) are created to effect segregation internally to R654AB/CTR, unless appropriate clearance limits are issued to the UA.

2.1.8 Separation between UA.

Separation of at least 500 feet vertically and/or 0.5 nm horizontally must be maintained from other UA.

2.1.9 Separation from crewed aircraft.

If positive or procedural separation is to be applied, it must ensure that the Shadow UA is not flown within 1 nm horizontally and/or 1000 ft vertically of crewed aircraft. To achieve this, ATC may use ATS Surveillance System, or procedural standards between Shadow and crewed aircraft.

Note: IAW the Shadow ATMP, visual separation is not an acceptable alternative and must not be used. There are therefore no approved separation/segregation methods that can be used between shadow and crewed aircraft when shadow is departing, landing, or conducting circuit operations at YBOK airfield.

2.1.10 Terrain

ATC may assign levels to Shadow below the Lowest Safe Altitude (LSALT). The Aircraft Captain (AC) shall be responsible for terrain separation at all times. The AC must advise ATC if any assigned level is not suitable.

2.1.11 Wake Turbulence

For the purposes of separation from wake turbulence, Shadow is to be treated as a LIGHT IFR category aircraft.

3 Launch

3.1.1 15 minutes prior to launch

The following procedure shall be carried out 15 minutes prior to launch:

The AC/MC (Aircraft Captain/Mission Commander) shall advise the launch time, preferred RWY direction, and request an airways clearance from Oakey ATC Clearance Delivery (ACD) for area operations, or from Tower controller (TWR) for Circuit operations .

The AC/MC shall report in receipt of the current ATIS to OAK Tower (TWR), and request permission for engine start.

ATC will assess the viability of the requested launch time and approve the engine start or negotiate an alternate time.

3.1.2 5 minutes prior to launch

The following procedure shall be carried out 5 minutes prior to launch:

The AC/MC shall activate the Shadow transponder and request a clearance from TWR to pressurise.

Note: *The launcher can only be held in pressurisation for 12 minutes before having to wait 30 minutes before restarting the process.*

3.1.3 Launcher Danger Area

Upon receipt of a clearance to pressurise, ATC and 20 Regt must protect the danger area applicable to the launch direction depicted in Figure 1. The launcher danger area extends 150ft left and right, direction of launch for 2000ft and is active during pressurisation. Autonomous system commanded manoeuvres by Shadow UA during launch operations require that airspace 1000 feet vertically and 0.5 nm radius laterally of the launch site must be held clear of crewed air traffic until the Shadow UA is established in stable UAS RP commanded flight.

3.1.4 Launch Approval

When ready the AC/MC shall request permission to launch. TWR will assess the viability of the launch and issue 'Launch Approved to the NW/NE' or 'stand-by'.



Figure 1: Launch Danger Area

4 Departure

Standard departure profiles for a North East and North West launch are depicted below. On first contact with Approach Control (APP) the AC shall provide a departure report IAW AIP.

Note: *Coordinates for North West Gate are Mil Grid: 56J LQ 6986 7550 or Lat Long: S27° 20 14.6 E151° 41 05.4*

4.1.1 ROZ LADDER

ROZ LADDER has been established as an alternate method for climb/descent to/from mission altitudes (Figure 8). ROZ LADDER is 1.5NM radius centred on 272135.45S 1514421.91E (56J LQ 75325 73077), SFC – 5500FT AMSL. It will be utilised as follows:

For traffic management, ATC may instruct Shadow to track to ROZ LADDER by the shortest direction of turn and climb not above 2500FT and report established. Once established, TWR will instruct the AC to contact APP who will issue an onwads clearance when available.

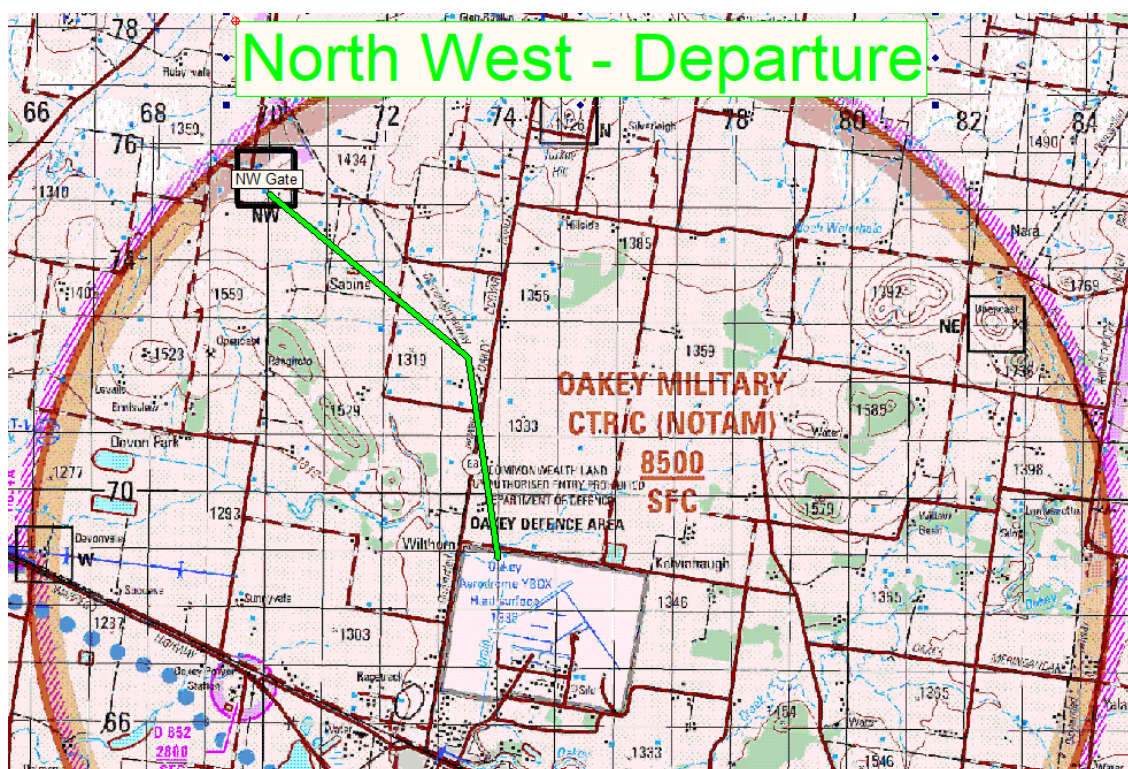


Figure 2: North West Departure

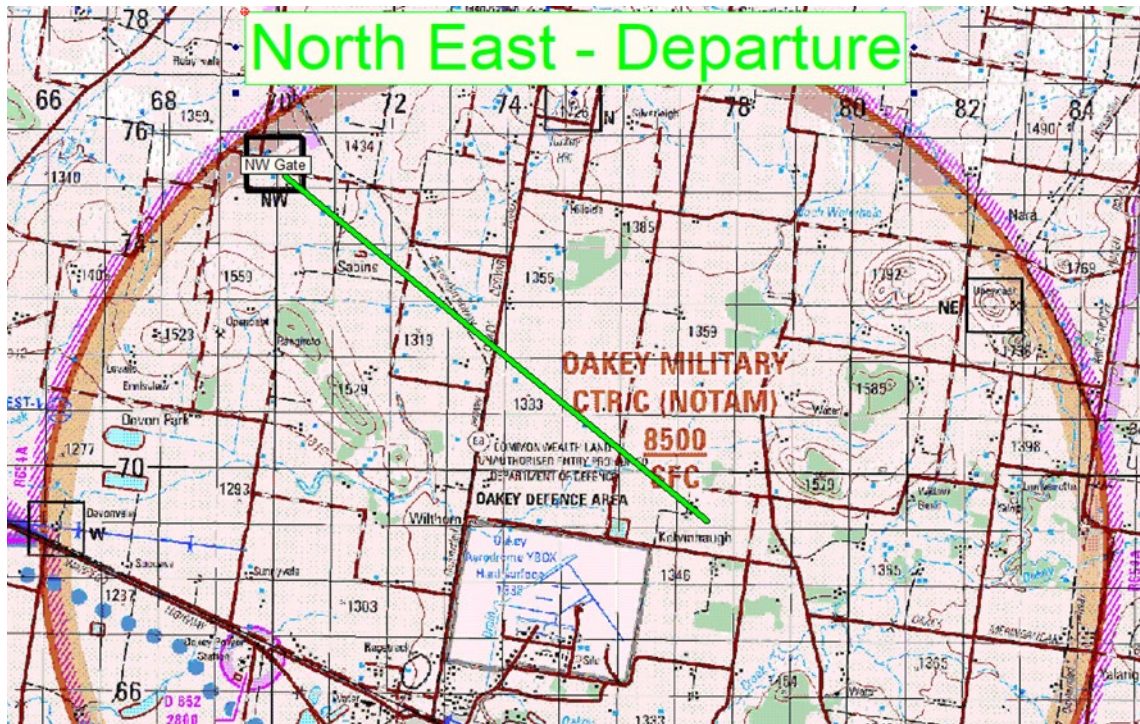


Figure 3: North East Departure

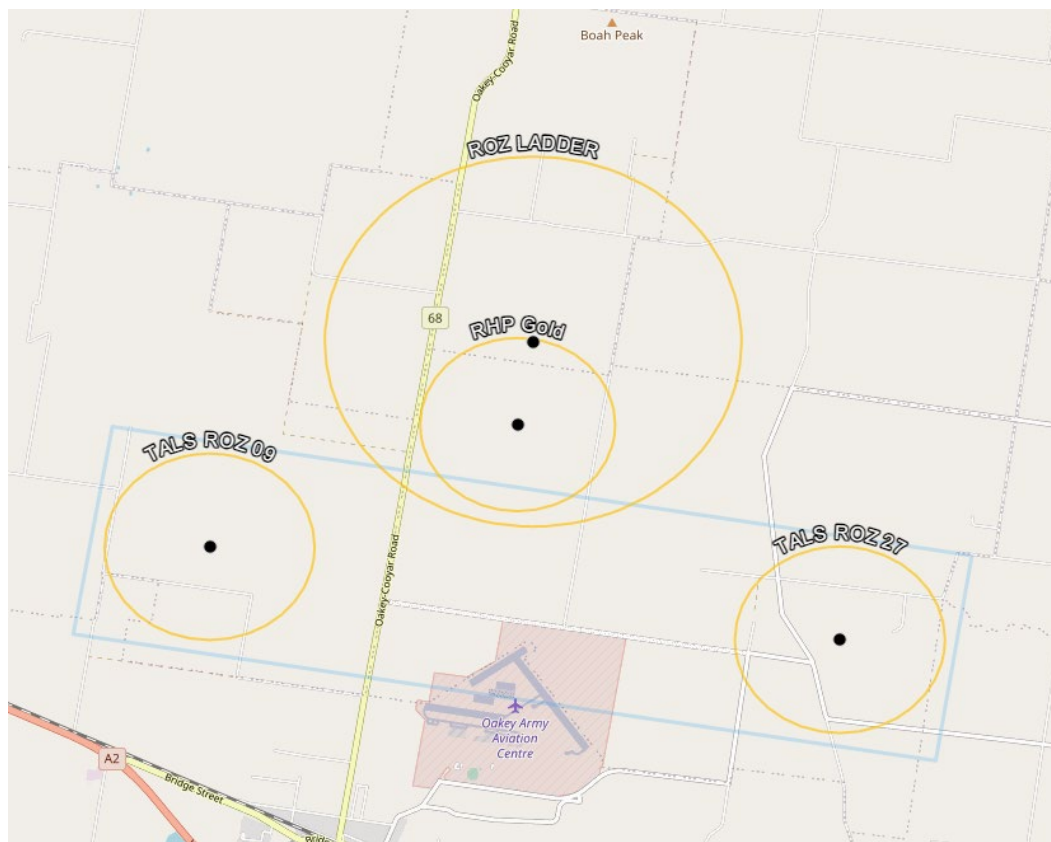


Figure 4: ROZ Ladder and TALZ ROZ 09/27

5 Transit and Mission Operations

The following procedures apply to transit and mission operations:

ROZ SHADOW is depicted in Figure 5. ATC may assign altitudes between 3500FT – 5500FT AMSL.

Shadow will enter and exit ROZ SHADOW IAW ATC airways clearance issued. MC should expect tracking via North West Gate (NWG).

The AC must request a clearance to deviate from the approved levels in ROZ SHADOW. ATC may issue heading and level instructions to facilitate separation with other traffic.

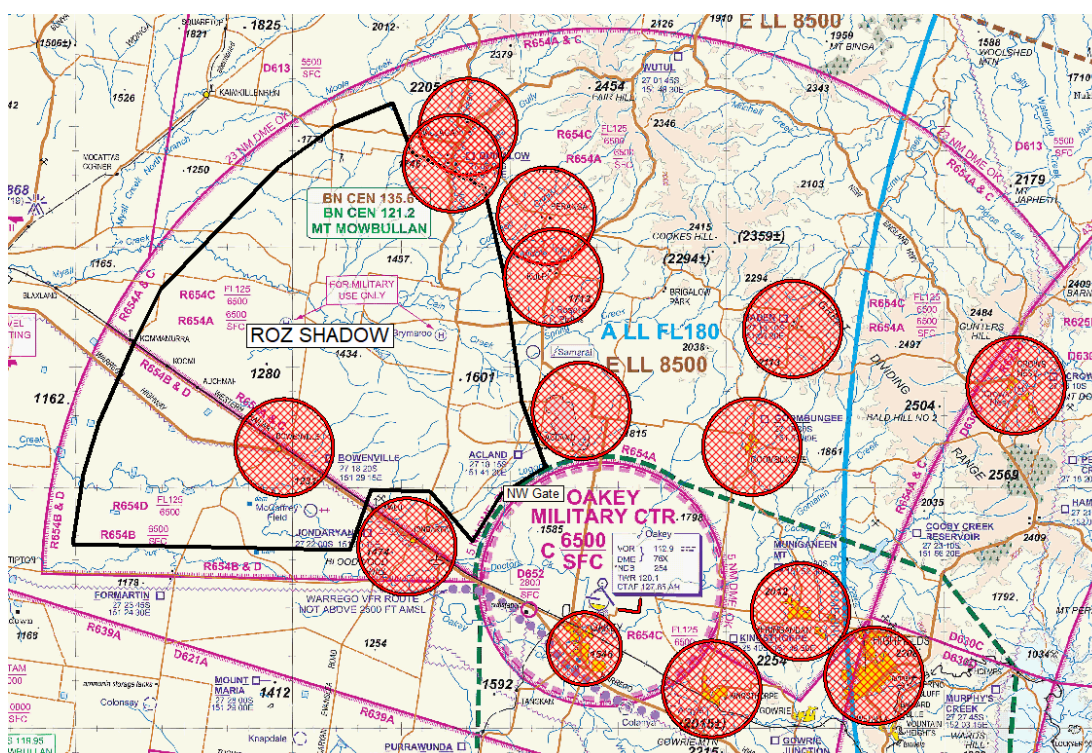
ATC may restrict Shadow operations vertically or laterally to facilitate crewed traffic.

Due to airworthiness restrictions, Shadow may not overfly larger population centres. These NO FLY areas are depicted below in Figure 5 in red.

The AC shall notify APP when operations are complete in ROZ SHADOW and ready to return to base.

Note: SFI 02/2020 requires the Shadow to be flown not above 3500ft in the CIRA east of Oakey, and not above 4500ft in the CIRA west of Oakey. SFI 02/2020 requires the MC to record the date, time and duration of occurrences of the Shadow being flown above these limitations.

Note: Terminology used in reference documents describes Shadow as only being authorised to operate inside military Restricted Airspace. While the Oakey CTR is not military restricted airspace, it is authorised for use by Shadow in [200212 – Brief – 6BDE – Request for approval to fly Shadow 200 TUAS operations in Oakey Restricted Airspace.](#)



5.1.1 ROZ SHADOW Coordinates

ROZ SHADOW is established IAW the following coordinates.

MGRS	Lat/Long
56J LQ 70820 77601	S 27° 19' 06.94" E 151° 41' 39.66"
56J LQ 68996 82517	S 27° 16' 26.60" E 151° 40' 35.19"
56J LQ 67504 92134	S 27° 11' 13.60" E 151° 39' 44.69"
56J LQ 65914 98994	S 27° 07' 30.13" E 151° 38' 49.59"
56J LR 60419 01556	S 27° 06' 04.91" E 151° 35' 31.07"
56J LR 58898 05343	S 27° 04' 01.30" E 151° 34' 37.41"
56J LR 54521 03483	S 27° 05' 00.10" E 151° 31' 57.78"
56J LR 50237 00256	S 27° 06' 43.32" E 151° 29' 20.84"
56J LQ 41489 90876	S 27° 11' 44.56" E 151° 23' 58.90"
56J LQ 39474 86860	S 27° 13' 54.18" E 151° 22' 43.78"
56J LQ 36831 80564	S 27° 17' 17.60" E 151° 21' 04.71"
56J LQ 35738 76597	S 27° 19' 26.02" E 151° 20' 23.07"
56J LQ 34962 71156	S 27° 22' 22.44" E 151° 19' 52.18"
56J LQ 56039 70977	S 27° 22' 36.85" E 151° 32' 39.15"
56J LQ 57572 75649	S 27° 20' 05.63" E 151° 33' 36.91"
56J LQ 62114 75590	S 27° 20' 09.23" E 151° 36' 22.13"
56J LQ 65331 71747	S 27° 22' 15.24" E 151° 38' 17.64"
56J LQ 67468 75464	S 27° 20' 15.23" E 151° 39' 36.89"
56J LQ 70989 77680	S 27° 19' 04.42" E 151° 41' 45.84"
56J LQ 70820 77601	S 27° 19' 06.94" E 151° 41' 39.66"

Shadow approach profiles are depicted below.

Figure 6: RWY 09 Approach

Figure 7: RWY 27 Approach

7 Recovery

Where possible, Shadow will provide ATC with 10min prior notice of intent to return to base.

If required for traffic management, ATC may instruct Shadow to track to ROZ LADDER from NWG at the lowest appropriate level.

Once established in ROZ LADDER the AC shall maintain the last assigned altitude and request descent to 3000FT AMSL and, when instructed, transfer to TWR.

7.1.1 TALS ROZ

The TALS ROZ are named for the landing direction and are established 4.2KM from Lane 3 as follows:

TALS ROZ 27. A circle of 1.4 km radius centred on 272400.40S 1514650.96E (56J LQ 79464 68657), 3000FT AMSL.

TALS ROZ 09. A circle of 1.4 km radius centred on 272315.23S 1514144.64E (56J LQ 71037 69962), 3000FT AMSL.

When able TWR will clear Shadow to the most appropriate TALS ROZ. Shadow may need to hold in the applicable TALS ROZ detailed below to lose altitude.

7.1.2 Landing

When ready to leave a TALS ROZ the AC/MC shall request permission to land. TWR will instruct the AC/MC to 'Report on the ground'. This instruction constitutes a clearance to leave the TALS ROZ and make an approach to the arresting system located on Lane 3.

8 Circuits

ROZ SHADOW CIRCUIT is depicted in Figure 8. The following procedures apply to Shadow circuit operations from Lane 3:

Shadow circuit operations will occur not above 3000FT AMSL inside ROZ SHADOW CIRCUIT; Planned circuit operations are to be noted in FLYPRO;

TWR shall issue a clearance for Shadow to operate in the ROZ SHADOW CIRCUIT AREA not above 3000ft.

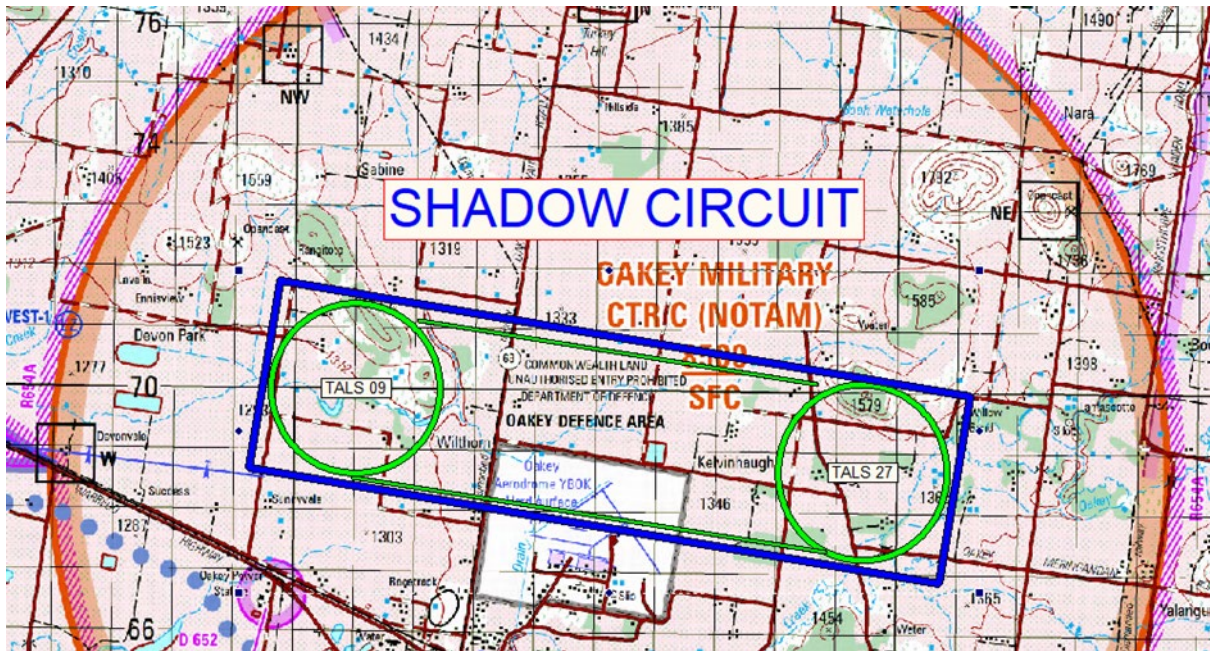


Figure 8: Shadow Circuit Area

8.1.1 Shadow Circuit Area Coordinates

Shadow Circuit Area is established IAW the coordinates below.

MGRS	Lat/Long
56J LQ 81212 69933	S 27° 23' 19.50" E 151° 47' 55.02"
56J LQ 80761 66861	S 27° 24' 59.18" E 151° 47' 37.52"
56J LQ 69231 68636	S 27° 23' 57.70" E 151° 40' 38.39"
56J LQ 69719 71747	S 27° 22' 16.78" E 151° 40' 57.35"
56J LQ 81212 69933	S 27° 23' 19.50" E 151° 47' 55.02"

9 Emergency procedures

9.1.1. Lost Link procedures

Shadow is incapable of changing SSR code in the event of a lost link situation. The AC/MC will immediately notify ATC if the AV loses link. The AV will proceed to the nearest point on the lost link route to return to ROZ LADDER. The lost link route is: BRYMAROO (YBYO) – NWG – ROZ LADDER. A single hold point has been established inside ROZ Ladder where the aircraft will loiter at 4000FT and/or 4500FT AMSL whilst link is attempted to be regained. This is referred to as 'Return Home Point Gold' (RHP Gold) indicated in yellow in Figure 9. Location is centred on 56JLQ7512871828 (-27.3711000°, 151.7373000°), with a radius of 1.3km. A Return Home Point shall be placed within ROZ Shadow with a five minute loiter to enable coordination with ATC prior to Shadow autonomously following its pre-determined return home route to the lost link hold point (RHP Gold).

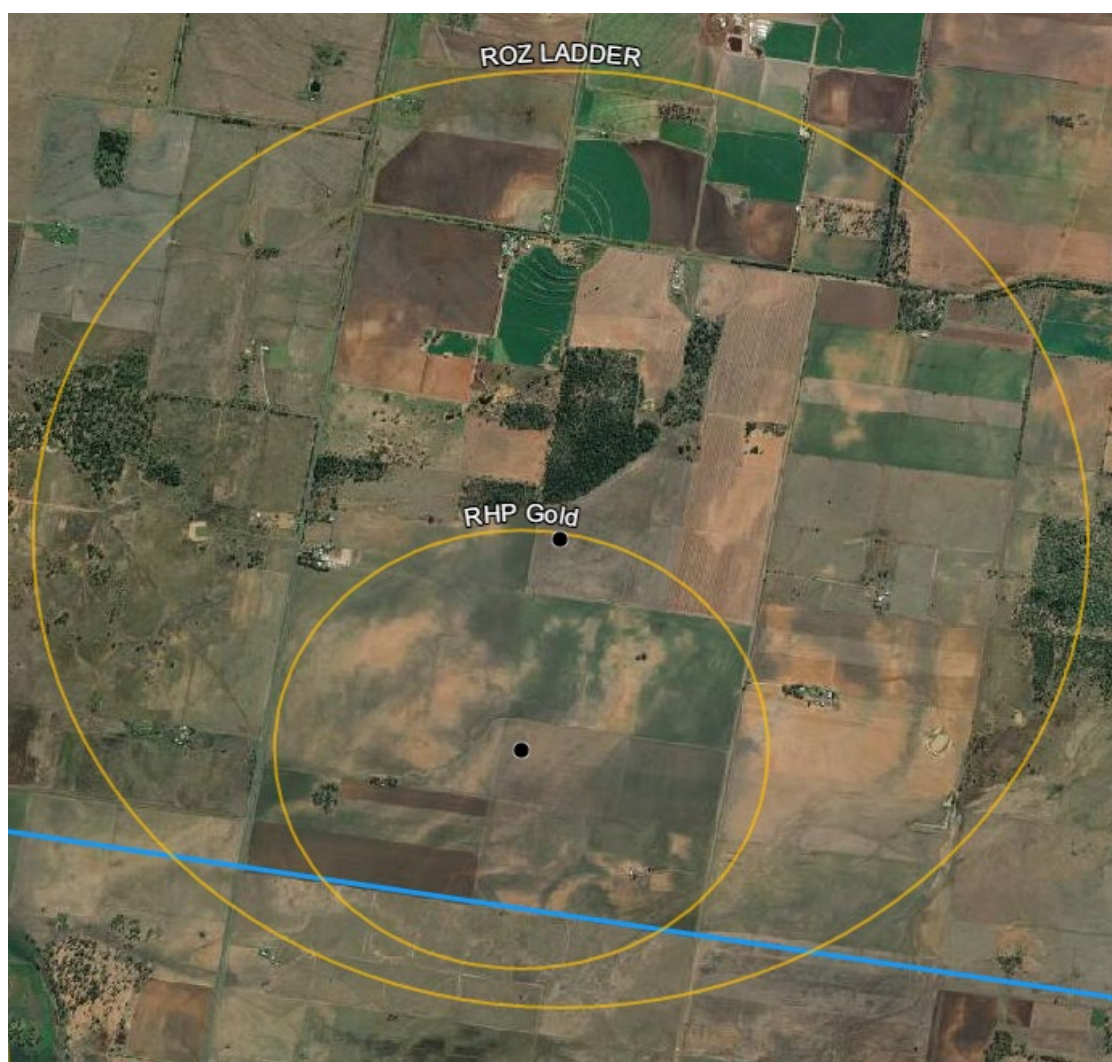


Figure 9: Shadow Return Home Point Gold

9.1.2 Ditching Locations

In the event Shadow encounters an emergency that requires intentional ditching of the aircraft, Shadow will attempt to fly or glide to the nearest planned ditching locations. The AC will report the last known location of the aircraft upon losing line-of-sight communication. The ditching locations are: YBYO, Wyoming (YWYO) and the Hover Training Area.

Expiry

This amendment is effective until cancelled, or until incorporated into OAK FIHA AD2 SUPP.

Approved:

WGCDR A Armstrong
CO 452 Squadron