

CHAPTER 25

30 mm RARDEN RANGES

INTRODUCTION

2501. **General.** There are three types of ranges for the 30 mm RARDEN cannon and the coaxial 7.62 mm MG which are mounted on several types of AFV. These are:

- a. Static with fixed firing points for basic live firing practice, calibration and in-service ammunition proof.
- b. Battle Runs for Fire and Manoeuvre Exercises (FMX). These can be conducted on fixed arc ranges of LFTTAs.. The RARDEN cannon is currently fired only when the AFV is stationary.
- c. Battle Shooting which is part of LFTT and is temporarily set up on a LFTTA.

2502. **Aim.** This chapter gives the requirements for designing and constructing RARDEN ranges, and in particular covers:

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2503. **Fixed Ranges.** MG may also be fired from a static vehicle on GR, ETR and Barrack Ranges under the same conditions as dismounted GPMG. However, tracer may not be fired on a Barrack Range and there are restrictions on a GR (refer to the relevant chapters).

RANGE DANGER AREAS

2504. **WDA Templates.** The WDA templates for 30 mm ammunition natures including BSD are given in Figures 25-1 and 25-2. Those for the MG are given in Chapter 19.

AFV FIXED RANGE ARC

2505. An AFV Fixed Arc Range is an open range primarily for use by AFVs, having no constructed bullet catchers, stop butts or backstops. There are designated arcs, manoeuvre lanes and firing positions/points and an impact area that can contain the full danger areas of authorised weapon systems, munitions and explosives within the overall range boundary. Due to their size, these ranges may also be employed as LFTTA in accordance with local RSOs.

DESIGN AND CONSTRUCTION

STATIC RANGES

2506. A Static Range requires a smaller area than a Battle Run or Battle Shooting Range. A static firing line and a Battle Run has a hardened surface of concrete, asphalt concrete or compacted road stone to accommodate one or more AFV.. It should be slightly raised above the surrounding ground and be flat with sufficient cross-fall to be free draining. The weapon danger area is measured from the fullest extent of each end of the Firing Point see that can position an AFV. If several AFV firing lines are provided, the range is divided into lanes unless the RDA is large enough for cross-lane shooting.

BATTLE RUNS

2507. **General.** The design of Battle Runs to provide Fire and Manoeuvre Exercises (FMX) will require detailed survey and planning. Such a range will only be possible on a considerable area of land or if a sea danger area (SDA) is available. The RAU can design an AFV fixed arc range where ground is a limiting factor.

2508. **Design Factors.** The following factors have to be considered in designing the range:

- a. Tactical scenarios to suit the ground.
- b. Target types and locations.
- c. AFV routes through the area.
- d. Earliest and latest points of engagement for each target.
- e. Establish the RDA by applying the WDA templates from each point of engagement to each target with specific arcs.

2509. **Impact Area and Targetry.** For impact areas refer to Chapter 2. Targets for both RARDEN cannon and MG may be a mix of hard and penetrable, static and moving (see Chapter 29).

2510. **Lane Markers.** Markers, with lights for night firing, are set up if confusion could arise over the permitted arcs of fire. See also Reference B (Pamphlet 21).

2511. **Firing Areas.** On the lanes (bounds) hardening the area with a base course may be necessary to reduce the damage done by manoeuvring AFV. The area should be clearly marked and slightly raised to ensure proper drainage. The area may have to be marked.

LIVE FIRING TACTICAL TRAINING (LFTT)

2512. **LFTT.** A LFTT Range is a temporary facility set up on a LFTTA. Safety staff under the direction of the RCO will control the movement of targetry.

RANGE INFRASTRUCTURE

2513. Behind the firing line or start line, a control room or tower which has sound insulation may be required. A troop shelter and Range Warden's store should have electricity and a water supply. Provision for vehicle movement and waiting areas also needs to be considered.

COMMUNICATIONS

2514. **External.** A means of summoning the emergency services, ideally a land laid telephone, is to be available.

2315. **Internal.** The RCO must be able to communicate with firing vehicles and safety staff will also require a reliable method of communication. Fixed firing points on the range should be connected by land line.

MAINTENANCE

2516. **Responsibilities.** Maintenance is the responsibility of the RAU. Responsibilities may be divided as follows:

- a. **Range Warden.** See Volume 1.
- b. **Property Management**
 - (1) Grounds.
 - (2) Fencing and sign posting). (See Chapter 2.)
 - (3) Structures, roads and drainage including stability of slopes and erosion control.
 - (4) Water and electricity supplies.
 - (5) Periodic refurbishment of the range structure.
- c. **Equipment Management.** Repairing and servicing equipment installed by single Service contract.

2517. **Frequency.** Proper maintenance is dependent upon good liaison between the Range Warden and the RAU, and on properly scheduled maintenance periods. A heavily used range may need one day's maintenance each week plus one or two days' maintenance by the Range Warden each month. Two closed periods of a week or so may be needed each year for building and earthworks repair; this work should be combined with the contract repair of equipment.

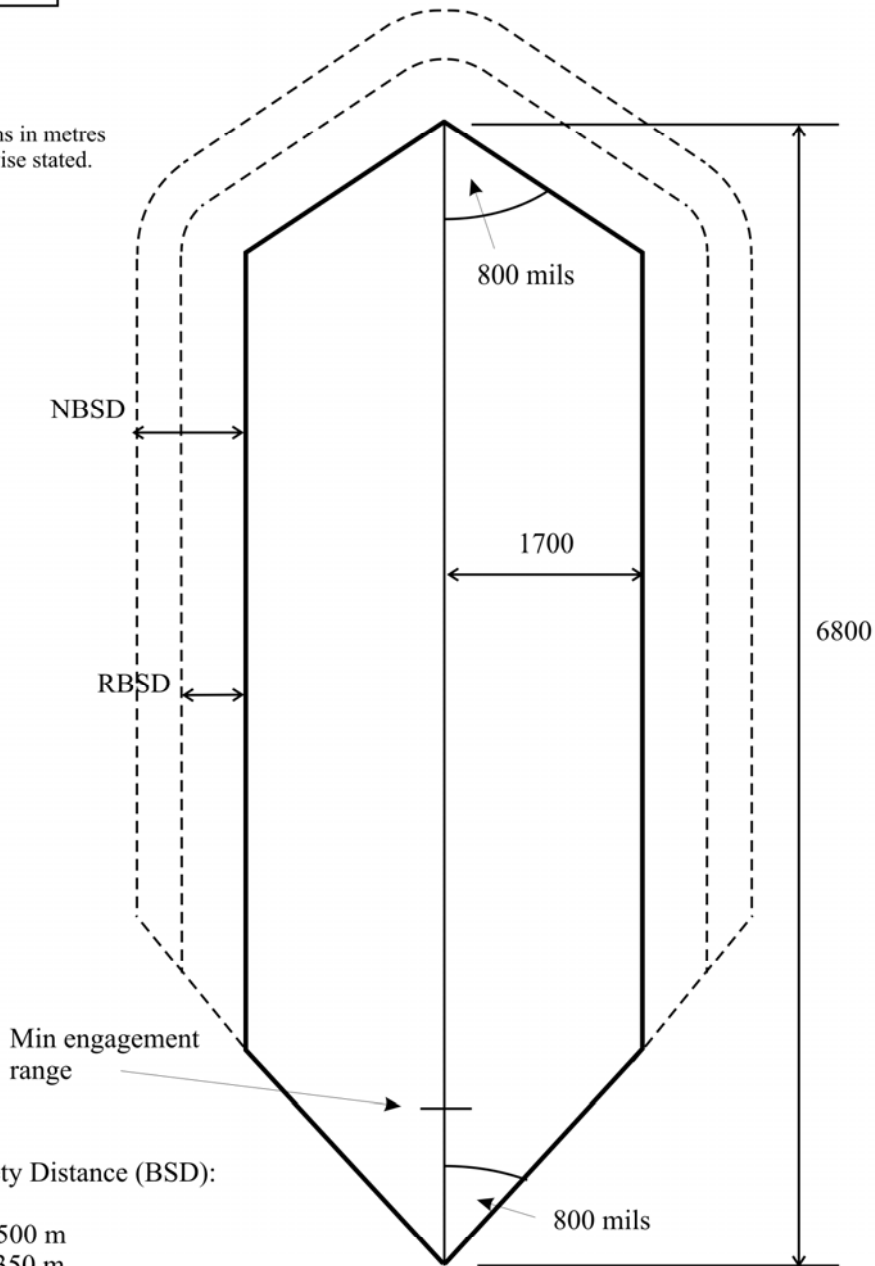
2518. **Targets.** Damage to targets and target positions can be considerable. It is essential after firing to ensure that target mechanisms remain properly protected. Any damage that cannot be rectified in a timely manner that may affect the safety of the rang should be recorded and relevant action taken.

2519. **AFV Routes.** FMX and battle run routes need to be kept in a reasonable state of repair. Excessive pitching and rolling could cause MG fire to go outside the RDA.

**Not to scale
Not to be copied**

Reference:
OB Proc 41160
Members Letter No.42/2001 Dated 2 Apr 01

All dimensions in metres
unless otherwise stated.



Notes:

1. Burst Safety Distance (BSD):
 NBSD - 500 m
 RBSD - 350 m
2. ADH - 9500 ft AGL
3. BSD in use to be used as the minimum engagement range.

Figure 25-1 WDA Template, 30 mm RARDEN HE L8/L13 - Hard Target.

**Not to scale
Not to be copied**

**Reference:
OB Proc 41160
Members Letter No.42/2001 Dated 2 Apr 01**

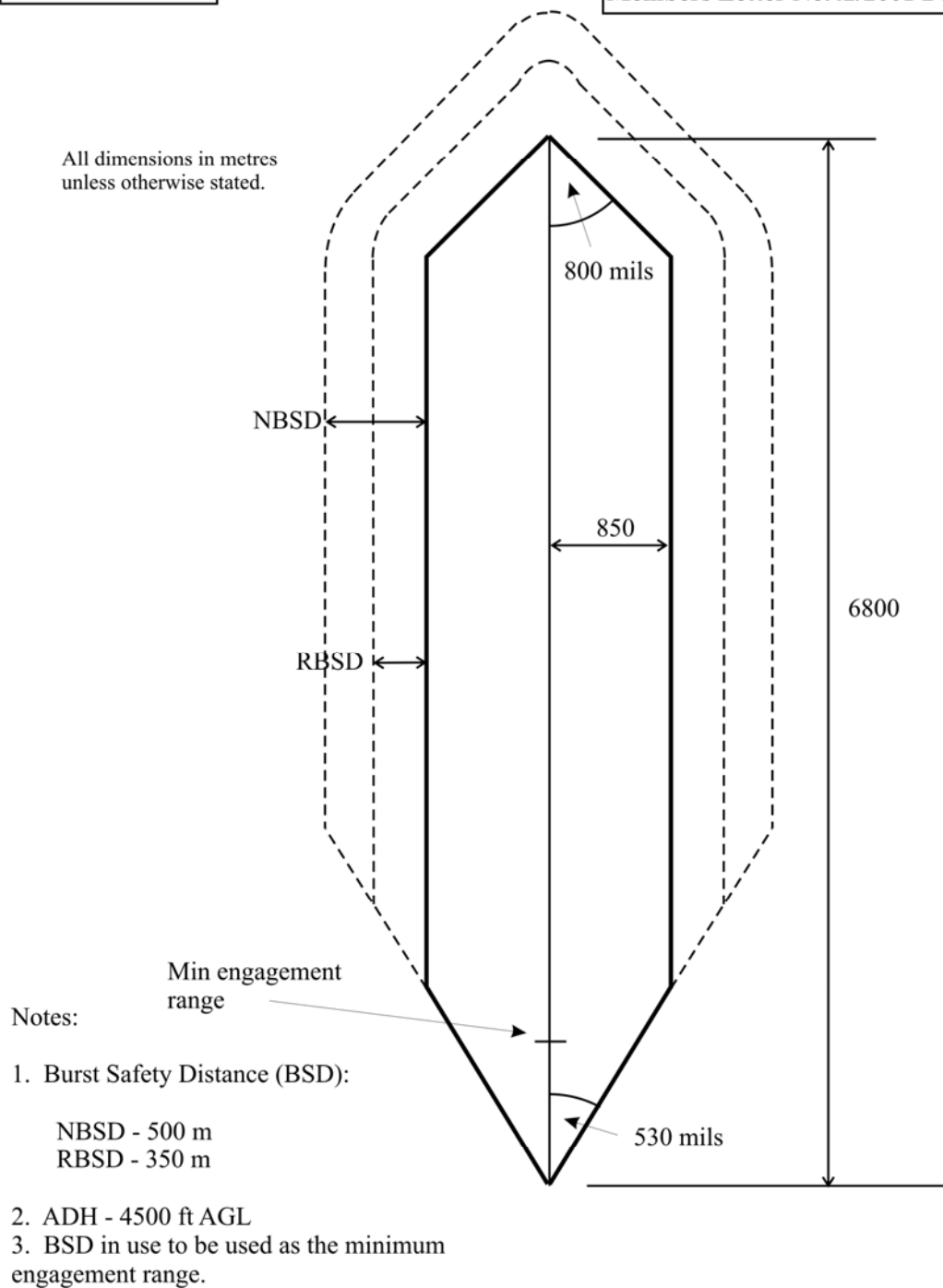
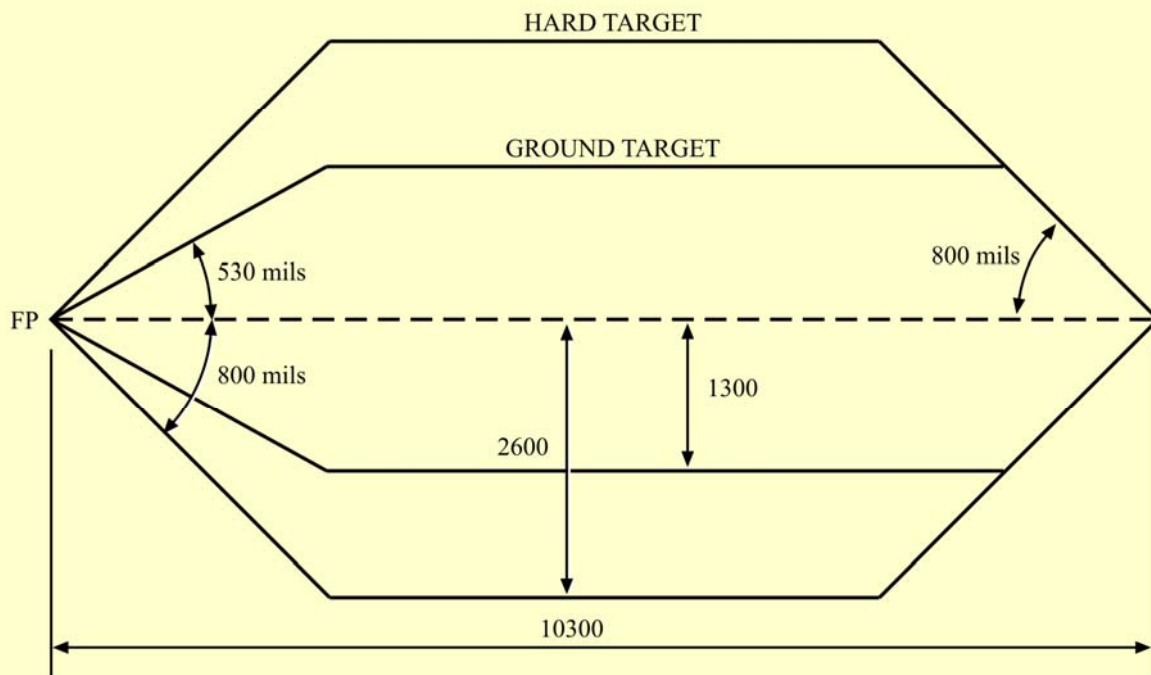


Figure 25-2 WDA Template, 30 mm RARDEN HE L8/L13 - GroundTarget.

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Reference:
OB Proc 41160
D/AG/9/2/3/2 dated 9 Sep 97

All Dimensions in Metres
unless otherwise stated



Notes:

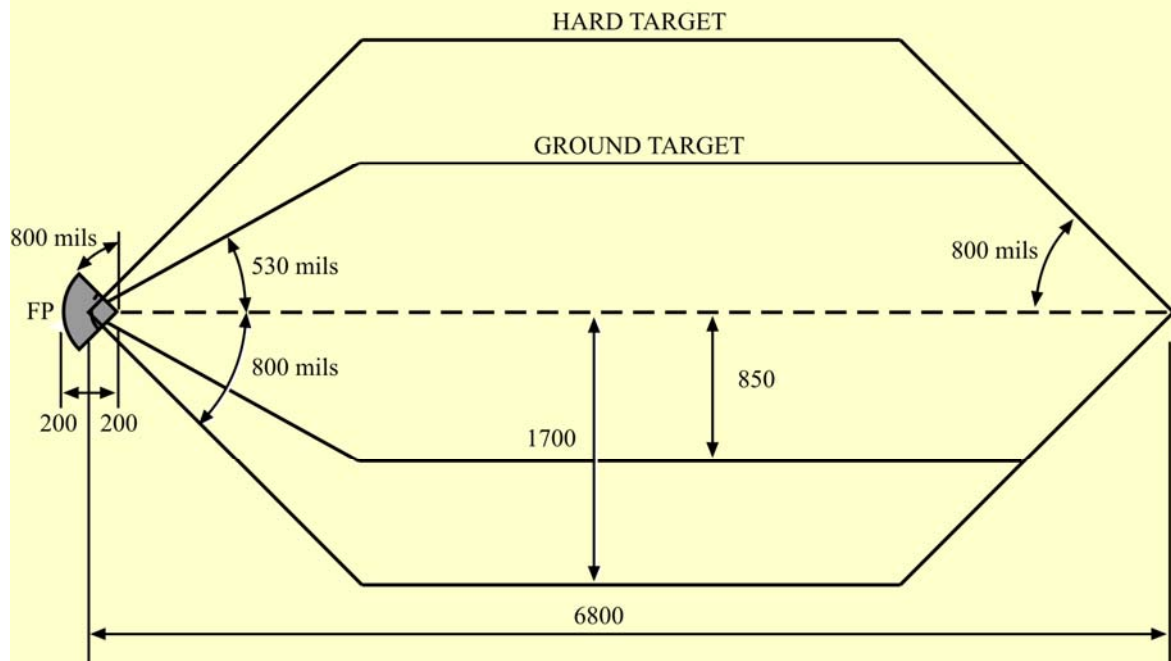
1. ADH: 13000 ft AGL.
2. Although this round has no "Burst Safety Distance" pieces of shot may be deflected up to 400 metres from the surface of the Hard Target.
3. Minimum range: 400 metres.

Figure 25-3. WDA Template, 30mm RARDEN APDS - Hard and Ground Targets

Reference:
OB Proc 41160
D/AG/9/2/3/2 dated 9 Sep 97

Not to Scale
Not to be Copied

All Dimensions in Metres
unless otherwise stated



Notes:

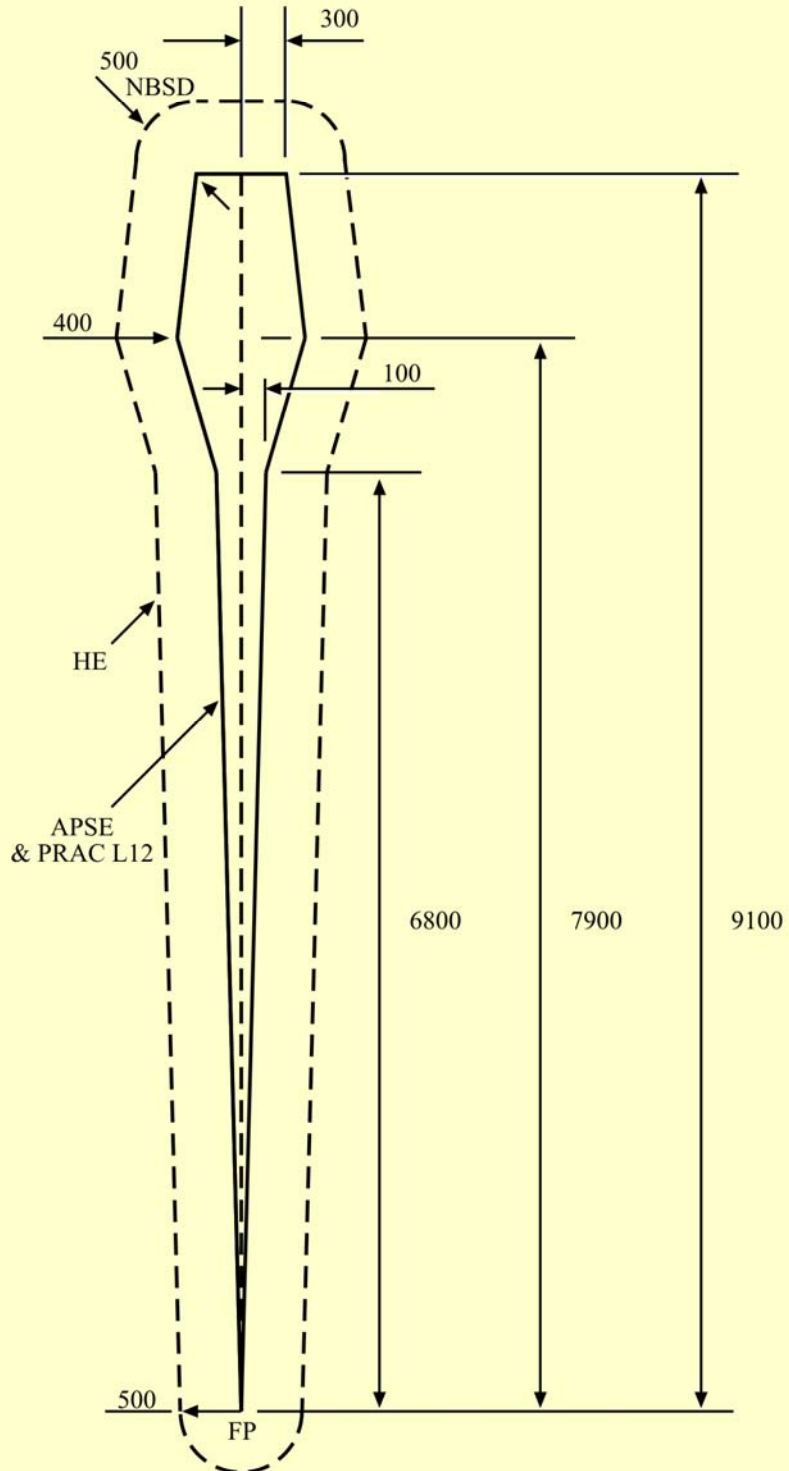
1. ADH: 13000 ft AGL.
2. Although this round has no "Burst Safety Distance" pieces of shot may be deflected up to 400 metres from the surface of the Hard Target.
3. Minimum range: 200 metres. When engaging at minimum range the wedge shape (shown shaded) at the firing point has to be clear of unprotected troops.

**Figure 25-4. WDA Template, 30mm RARDEN APSE or Prac L12
Hard and Ground Targets**

**Not to Scale
Not to be Copied**

All Dimensions in Metres
unless otherwise stated

**Reference: OB PROC 41160
D/AG/TS/9/2/3/2 dated 9 Sep 97**



Notes:

1. ADH: 17200 ft AGL.
2. This WDA template is for single shot only.

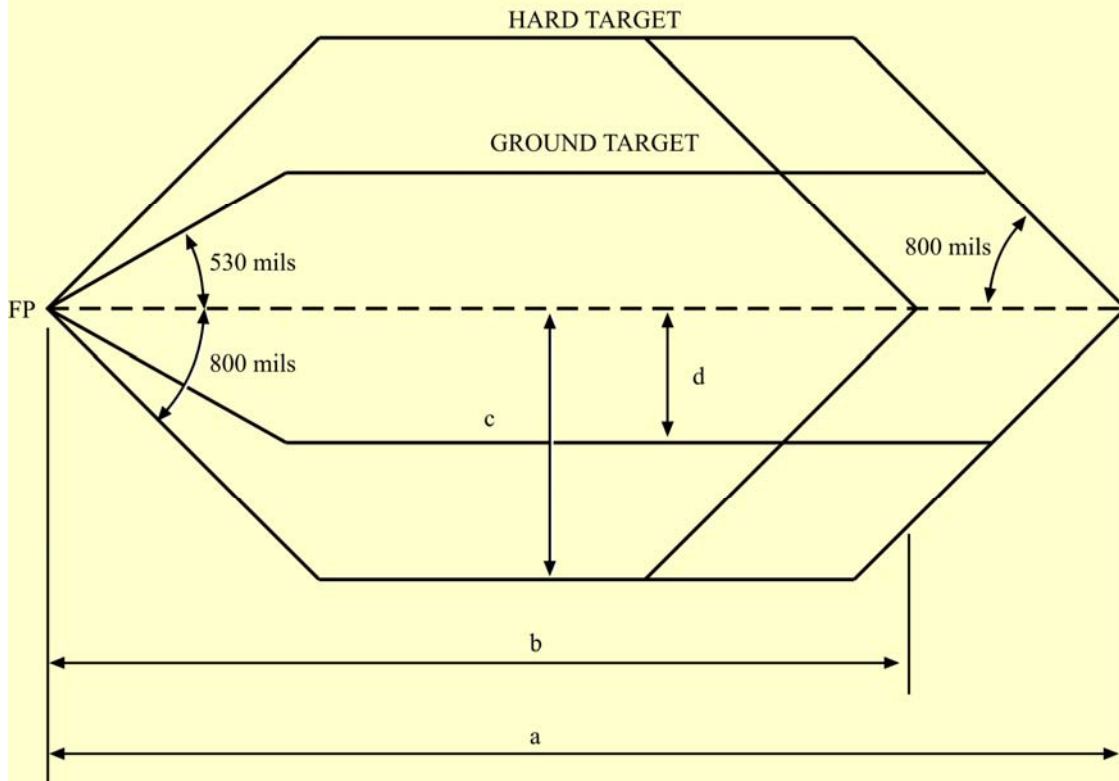
Figure 25-5. HEF WDA Template, 30mm RARDEN HE L8/L13, APSE or Prac L12

**Not to Scale
Not to be Copied**

**Reference: OB ML 41/98
D/DE(SL)8/5/2 Mar 00**

Dimensions		
Length		
a	Full	5000
b	Reduced (Note 1)	4000
Width		
c	Hard Target	1000
d	Ground Target	500

All Dimensions in Metres
unless otherwise stated



- Notes:
1. QE < 115mils
 2. ADH: 5500 ft AGL at QE < 533mils.

Figure 25-6. WDA Template, 30mm RARDEN - Discarding Sabot Reduced Range Round (DSRR) Practice (PRAC) Round L15A1, L15A2 & L15A3 Hard and Ground Targets