

Chapter 9G Some Statistics

Rate of Fire

Generally speaking, the ability of a weapon to fire a 1000rpm does not translate into its operator doing so in either training or combat. Soldiers place a premium on conserving ammunition and delivering accurate and aimed but rapid fire as the situation demands or orders instruct. In combat, fire must also be measured to prevent barrels from warming to dangerous levels, where “cook-offs” can occur in the breach or the barrel can fail – with fatal results to the weapon crew. For these reasons, and to allow logisticians to determine the frequency and scale of resupply, weapons are allocated rates of fire, typically rapid, normal and slow.

| Weapon | Magazine | Rate of Fire | | | |
|---------------------|--------------|--------------------|--------|------|-----------|
| | | Rapid | Normal | Slow | Very slow |
| R4 Rifle | 35/50 rounds | 35rpm | 20rpm | - | - |
| Mortar, 60mm | - | 12bpm | 8bpm | 4bpm | 2bpm |
| Mortar, 81mm | - | 12bpm | 8bpm | 4bpm | 2bpm |
| Missile, ATG, Milan | - | - | 3/4rpm | - | - |
| AT Gun, Rcl, 106mm | - | 10rpm ¹ | 1rpm | - | - |

Table 9G.1: A selection of infantry weapons with their rates of fire.

Ammunition scales

For the sake of planning and resupply, ammunition is issued in terms of scales. As is the case elsewhere in the logistics system, ammunition is held in the first, second, third and fourth lines. As always, the first line represents the end-user, the second the unit quartermaster level, the third SANDF depot level and the fourth, the national industry. Only the first two lines of a typical infantry battalion concern us here:

| Weapon | Type of Ammunition | Scale per individual weapon | | | | | Packaging |
|----------|--------------------|-----------------------------|----------------------|-------------------|-------------|------------------------------|-----------------------|
| | | First line (with weapon) | First line (reserve) | First line: Total | Second line | First and second line: Total | |
| R4 Rifle | Sharp | 300 ² | 150 | 450 | 900 | 1350 | 2000 rounds per crate |
| GPMG | Sharp/Tracer | 11,000 | 6000 | 17,000 | 33,000 | 50,000 | 1240 rounds per |

¹ After firing five rounds at this rate, the weapon has to cool for 15 minutes.

² 5x35 round magazines, 2x50 round assault magazines, 25 loose rounds.

| | | | | | | | |
|---------------------------|--------------|-----------------|-----|----------------------------|----------------------------|------|-----------------------|
| | | | | | | | crate |
| Pistol, 9mm | Sharp | 16 | 8 | 24 | 48 | 72 | 1750 rounds per crate |
| Mortar, 60mm ³ | HE | 72 | 24 | 96 | 192 | 288 | 16 rounds per crate |
| | Smoke | 16 | 16 | 32 | 64 | 96 | |
| | Illuminating | 15 | 5 | 20 | 40 | 60 | |
| Mortar, 81mm | HE | 90 | 60 | 150 | 300 | 450 | 6 rounds per crate |
| | Smoke | 36 | 18 | 54 | 108 | 162 | |
| | Smk (blue) | 3 | 3 | 6 | 12 | 18 | |
| | Smk (red) | 3 | 3 | 6 | 12 | 18 | |
| | Illum | 12 | 6 | 18 | 36 | 54 | |
| | Airburst | 50 | 25 | 75 | 150 | 225 | |
| | WP | 36 | 18 | 54 | 108 | 162 | |
| ATGM, Milan | HEAT | 8 | 8 | 16 | 32 | 48 | |
| ATG, 106mm | HE | 5 | 15 | 20 | 40 | 60 | 2 rounds per crate |
| | HEASH | 5 | 15 | 20 | 40 | 60 | |
| | HEAP | 2 | 4 | 6 | 12 | 18 | |
| | 12.7 | 60 | 180 | 240 | 480 | 720 | |
| Grenade, Hand, M26 | HE | - | 882 | 882 | 1764 | 2646 | 4 grenades per crate |
| Grenade, Rifle, AP65 | HE | - | 378 | 378 | 756 | 1134 | |
| Grenade, WP | WP | - | 378 | 389 | 756 | 1134 | 18 grenades per crate |
| Grenade, No 83, Smoke | Red | - | 90 | 90 | 180 | 270 | 16 grenades per crate |
| | Green | - | 90 | 90 | 180 | 270 | |
| | Yellow | - | 90 | 90 | 180 | 270 | |
| Grenade, Instant Light | WP | 36 ⁴ | 108 | 144 | 288 | 432 | |
| Ratel 20 | HE | 900 | 450 | 1350 | 2700 | 4050 | |
| | API | 300 | 150 | 450 | 900 | 1350 | |
| Ratel 60 | HE | 45 | 30 | 75 | | | |
| | Smoke | 3 | 3 | 6 | | | |
| | Illum | 3 | 3 | 6 | | | |
| Ratel 90 | HE | 12 | 5 | 17 | 8 | 25 | |
| | HEAT | 8 | 5 | 13 | 4 | 17 | |
| Smoke Generator, Ratel | WP | 12 | 24 | 36 per vehicle, 216 per Bn | 52 per vehicle, 432 per Bn | 648 | |
| Trip flares ⁵ | WP | - | 120 | 120 | 240 | 360 | 12 per crate |
| Signal | Yellow | - | 96 | 96 | 124 | 220 | 12 per |

³ The figure here represents the scale of issue to motorised- and paratroops. The first line for the mechanised infantry is capped at 32 rounds of all types because of spatial considerations in the Ratel IFV. The first line reserve is therefore greater. The total first line and second line is the same.

⁴ Four per infantry section

⁵ Issued as required

| | | | | | | | |
|---|--------------|----|----------|----------|------------|------------|-------------------------------------|
| flares | Red Green | | 96 96 | 96 96 | 192 192 | 288 288 | crate |
| Illum flares | 150m 300m | - | 60 60 | 60 60 | 120 120 | 180 180 | 12 per crate |
| Signal cartridges, 15mm (Pencil flares) | | 18 | 9 | 27 | 54 | 81 | 9 per pouch, three colours |
| Mine, Anti- Tank, No 8 | | - | 100 | 100 | 200 | 300 | |
| Mine, Shrapnel (Claymore) | | - | 428 | 428 | 856 | 1264 | Four per container |
| Safety fuse | | - | 100m | 100m | 200m | 300m | |
| Fuse | | - | 200m | 200m | 500m | 700m | |
| Fuse clamps | | - | 90 | 90 | 180 | 270m | |
| Detonator, Demolition, S4 | | - | 80 | 80 | 200 | 280 | |
| Detonator, Demolition, D4 | | - | 10 | 10 | 30 | 40 | |
| Safety match | | - | 5 | 5 | 10 | 15 | |
| Trigger, Demolition, No 4 Pull ⁶ | | - | 120 | 120 | 100 | 220 | |
| Trigger, Demolition, No 5, Pressure | | - | 120 | 120 | 100 | 220 | |
| Trigger, Demolition, No 6, Release | | - | 120 | 120 | 100 | 220 | |
| Firing mechanism with firing cap | | - | 360 | 360 | 300 | 660 | |
| Explosives, Demolition, RDX 28g | | - | 90 | 90 | 230 | 320 | |
| Explosives, Demolition, Plastic, 450g | | - | 50 | 50 | 150 | 200 | |
| Explosives, Demolition, 14.5kg | | - | 5 | 5 | 10 | 15 | |

⁶ These triggers are useful for booby-traps

| | | | | | | | |
|--|--|---|---|---|---|---|--|
| IR Fence (IR15) ⁷ | | 6 | 1 | 7 | - | 7 | |
| Seismic detector (Tobias) ⁸ | | 6 | 1 | 7 | - | 7 | |

Table 9G.2: A selection of infantry weapons with their ammunition scales.

| Weapon | Type of Ammunition | Scale per individual weapon | | | | | Packaging |
|---------|--------------------|-----------------------------|----------------------|-------------------|-------------|------------------------------|-----------|
| | | First line (with weapon) | First line (reserve) | First line: Total | Second line | First and second line: Total | |
| GDF Mk5 | HE | 650 | | 650 | 600 | 1250 | |
| 35mm | SUL (PT) | 300 | | 300 | 240 | 540 | |
| AAA | AP | 25 | | 25 | 8 | 33 | |

Table 9G.3: A selection of artillery with their ammunition scales.

Frontages and depth

Advance

- During the advance to contact, recce elements consisting of an armoured car regiment can cover a front of 80-100km on open, flat terrain. Each of its squadrons will cover a front of 20-30km. (This implies five or six squadrons a regiment, with five allocated one route each and a sixth in reserve.
- The distance between the recce elements and the advance guard can range from five to 50km.
- Combat Groups in the advance guard deploy their own recce screens, up to 5km ahead of themselves.
- The front of an advance guard is determined by the terrain, grouping of the force and the range of its direct weapons. As a rule of thumb, a squadron of tanks can influence an area of 5x5km with fire.

Attack

- Foot
 - Day
 - Against strong resistance: 700m max per Bn, 400m per company
 - Against poor resistance: 1200m per Bn, 600m per company

⁷ These were withdrawn from service in the 1980s. They are useful, especially in the absence of antipersonnel mines and this technology should be reacquired. Scale of issue: Two per company, one per Bn HQ. Detects vehicles, personnel breaking IR beam. Beam generator and detector can be as far as 200m apart.

⁸ These were withdrawn from service in the 1980s. They are useful, especially in the absence of antipersonnel mines and this technology should be reacquired. Scale of issue: Detects personnel to a range of 50m and vehicles at 500m using geophones buried in the earth. Hard ground works best.

- Depth of attack (into enemy position): up to 2000m from forward enemy posts
 - Night (Linear⁹)
 - Bright moonlight: 700m max per Bn, 400m per company
 - Dark night: 400m max per Bn, 200m per company
 - Depth of attack (into enemy position): up to 1000m from forward enemy posts
- Mounted

The frontage of a mounted attack depends on the formation used. In daylight, tanks and other armoured vehicles will generally be spaced 150m apart. At night the distance can be reduced to 50m. As a rule of thumb, a tank squadron has a frontage of 800m and a regiment, with two squadrons abreast can cover 1500m. The depth of the attack is limited by ammunition and fuel supply.

Defence

- Infantry The frontage of a battalion in the defence is determined by the firing range of the section machine gun. The emphasis must always be on mutual support. The battalion's companies, platoons and sections will generally be deployed in an inverted triangle, with two elements facing the enemy and one in reserve behind ("in depth"). This makes for a max frontage of 1800m for the Bn and 800m for the company – at full strength. Depending on the soil, it will take 24hrs to prepare such as position.
- Armour In a defensive position, armoured vehicles must be provided a main, secondary and one or more alternative positions and should regularly alternate between these. The vehicle should not fire more than once out of the same position as it is then likely to be located by the enemy and engaged. These positions must at least be 50m apart to be practical. Each tank, armoured car or ICV thus needs 100m of front.

Movement times

Movement by road

| | Day (km/h) | Night (km/h) |
|--|---------------|-----------------|
| • Column (excluding tanks, tank transports, etc.) | | |
| ○ Good roads | 70 | 50 |
| ○ Winding, hilly roads | 60 | 40 |
| ○ Poor roads | 45 | 30 |
| • Columns including tank transports, but without tanks running on tracks | | |
| ○ Good roads | 45 | 30 |

⁹ As opposed to an infiltration night attack

- Poor roads 30 15
- Tracked vehicles
 - Good roads 30 15-25
 - Winding, hilly roads 20 15
 - Cross country 20 15

Tactical movement in the field

- On foot
 - Day
 - In contact 100m in three minutes (2km/h)
 - Not in contact 4-5 km/h
 - Night
 - In contact (moonlight) 100m in five minutes (1.2km/h)
 - In contact (dark) 100m in eight minutes (0.75km/h)
 - Out of contact 4km/h
- Mounted
 - Day
 - Contact expected 12-20km/h
 - Not in contact 20-45km/h (dependent on terrain)
 - Mounted attack 8km/h
 - Night
 - In contact 100-200m per minute (6-12km/h)
 - Not in contact 15-25km/h (dependent on terrain)
 - Mounted attack 4km/h

Timeframes for attacks from making contact with the enemy to attacking¹⁰

- Quick attack
 - Combat team 20-40 minutes
 - Combat group 30-60 minutes
 - Brigade 60-120 minutes
- Deliberate attack
 - Combat team Not less than 4 hours
 - Combat group Not less than 8 hours
 - Brigade Not less than 24 hours

Timeframes for entrenching, etc

- | | Time | Work party |
|---|-------------|-------------------|
| ● Excavating a two-person battle trench with hand tools and adding overhead protection: | 6.25 hrs | 2 people |

¹⁰ Conventional warfare

- Excavating a four-person battle trench with hand tools and adding overhead protection: 10 hrs 4 people
- Medical post (explosives and hand digging): 4 hrs 10 people
- 81mm mortar emplacement: 4 hrs 6 people
- MG emplacement: 5 hrs 3 people

Timeframes for clearance tasks

| Task | Tools | Output |
|---|---------------------------------------|---|
| Cutting weeds, grass, etc. | Mower pulled by light tractor | 10,000 sq m/hr |
| | Hand tools | 80 sq m/hr per person |
| Clearing brush/scrub | Medium dozer | 1000 sq m/hr |
| | Hand tools | 40 sq m/hr per person |
| Clearing dense undergrowth with saplings up to 10cm in diameter | Medium dozer | 1000 sq m/hr |
| | Hand tools | 14 sq m/hr per person |
| Clearing primary jungle with trees 90cm and larger | Heavy dozer & six men with hand tools | 625 sq m in 100 m strips/hr |
| Clearing trees, 10cm – 25cm in diameter | Medium dozer | 3-10 minutes a tree |
| Clearing trees & stumps 30-75cm in diameter | Medium dozer | 20-60 minutes per tree |
| Grubbing stumps by blasting | 3-person team with pneumatic tools | 30-60 minutes per stump |
| Breaking boulders by blasting | 3-person team with pneumatic tools | 40-60 minute per 2 or 3m diameter boulder |