# NZAR A83 Cannon ball sizes Borgards standardised ordnance

**Researched and compiled by Dr John Osborne MG DTT PhD FSG April 1994, reviewed March 2016**

In 1712, Colonel Albert Borgard was appointed Chief Firemaster and later, in 1718, Assistant Surveyor of Ordnance. He rationalized the multitude of gun types then in the Royal Ordnance and specified a complete system of artillery. His designs were accepted in 1716. Few of his gun designs were successful and they were redesigned when Armstrong was appointed Surveyor of Ordnance in 1722. But Borgard's effort to standardize the Ordnance had long lasting effect.

Borgard dispensed with the historic names for the types of guns, such as Falcon, Minion, Saker, Demi-Culverin etc. and specified each type by the weight of the round cast iron shot (cannonball) they fired. He further limited the number of cannonball weights to a strict set of values:

The large gun values were **4, 6, 9, 12, 18, 24, 32** and **42** pounds (*lb*), where 1 *lb* = 0.45 *kg*.

**Cannon calibre and windage**

The bore of the cannon were made larger to allow for the rough casting and rusting of the cannonballs, as well as the irregularities in the casting and boring of the gun. The difference in diameter is termed "windage". The final bore diameter and hence the windage of earlier 16th and 17th century guns was a matter for the skill of the gunfounder. A value of 0.2 to 0.25 inches was typical.

Albert Borgard specified that along with the weight of cannonballs the windage of the guns should be standardised. He specified that the bore diameter should be $^{21}/_{20}$ of the gun's round shot diameter. This gives a windage value of 0.2" for a 4 *lb* cannon but gives a rather large 0.33" for a 42 pounder. To increase the efficiency of the guns the windage was reduced to $^{25}/_{24}$ in the Blomefield pattern guns (1787).

| Round Shot Weight (*lb*) | Round Shot Diameter (*in*) | $^{21}/_{20}$ Calibre (*in*) | $^{25}/_{24}$ Calibre (*in*) |
|---|---|---|---|
| 4 | 3.05 | 3.20 | 3.18 |
| 6 | 3.50 | 3.67 | 3.65 |
| 9 | 4.00 | 4.20 | 4.17 |
| 12 | 4.40 | 4.62 | 4.58 |
| 18 | 5.04 | 5.29 | 5.25 |
| 24 | 5.55 | 5.82 | 5.78 |
| 32 | 6.10 | 6.41 | 6.36 |
| 42 | 6.68 | 7.02 | 6.96 |

Round shot diameter, $^{21}/_{20}$ cannon calibre (bore diameter) and $^{25}/_{24}$ cannon calibre for the standard British cannonball weights.

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