

# U.S. CIVIL WAR CARBINES: SERVICE AND SURVIVAL

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## Summary

The U.S. Ordnance Department bought 397,865 American carbines during the Civil War. As of June 30, 1866, fourteen months after Appomattox, 230,040 of them were still accounted for—either in storage, taken home by soldiers who bought them as they mustered out, already sold or still issued to the troops. This generates a known Civil War survival rate of 57.8% for the twenty Ordnance-procured carbines combined. Survival rates varied from a low of 26.3% for the Hall carbine, to a high of 100.0% for the Ball carbine. The best indicator of survival rate is the date of first delivery to Ordnance; those carbines delivered earliest in the war had the lowest survival rates, and those delivered latest had the highest survival rates. Other factors, however, significantly affected survival. The strengths and limitations of the Ordnance data are evaluated in detail. Each of the twenty carbine brands is discussed individually, including information on procurement, delivery, quality, Civil War service, survival rate, use of captured carbines by the Confederacy and post-war disposal. The significance of unaccounted for carbines in the calculations - unrecorded carbines, carbines taken by deserters and Confederate captured and collected guns - is analyzed.

## Introduction

Most collectors of antique American firearms are interested in the rarity and survival rates of the guns they collect. Unfortunately, good survival data are hard to come by. Uncertainty about total production is a factor with some models, but the biggest problem is estimating how many still exist. For truly rare guns that have always been in very high demand - the Walker Colt for example - we have a pretty good idea of how many survive (around 200) because almost all survivors have been located. For most models, though, estimates are a lot less accurate.

It's still possible to calculate a known survival rate through statistical analysis of very large databases, but those databases are rare and the accuracy of the survival statistic even then can vary substantially between models.<sup>1</sup> Fortunately, there exist internally consistent pre- and post-war Ordnance Department data on U.S. carbine procurement, storage, issuance, commercial sales, and post-war sales to soldiers. Together, these data allow us to calculate with substantial accuracy the survival rates of the twenty brands of American carbines procured by Ordnance as of the end of the Civil War. These statistics are important. The Civil War was the most explosive period in 19th century American firearm innovation, and it was the single most important factor in the survival of most of these guns. During 1864 alone, Ordnance replaced 93,394 carbines that were either damaged, destroyed or lost in battle.<sup>2</sup> This analysis quantifies which carbines suffered the highest and lowest attrition during the war, and examines why.

## PART I - THE AMERICAN CARBINE ON THE EVE OF THE CIVIL WAR

The United States disbanded all mounted troops after the War of 1812, but as trade and settlement made inroads into the American west a mounted military force became increasingly necessary. In

1832 a battalion of 600 rangers was authorized by Congress, and in 1833 it was converted into the first regiment of U.S. Dragoons. Recognizing the need for a specialized long arm for their use, the Dragoons were armed with the new Model 1833 Hall-North carbine. This was the first percussion weapon, the first breechloader and the first carbine adopted by the U.S. military for active service.<sup>3,4</sup> About 27,185 Hall and Hall-North carbines were ultimately made, in five different models, through 1853 (Table 1).

The Texas Revolution (1835-1836), the Mexican War (1846-1848) and increasing conflict with Indians on the frontiers of America led to rapid evolution in American firearms technology - including the carbine. The three biggest trends were from muzzle-loader to breechloader; from the percussion ignition system to the use of internally primed metallic cartridges; and from the single shot to the repeating firearm.

As a breechloader, the Hall carbine was ahead of its time. The U.S. Springfield Armory continued making muzzleloading carbines in the 1840s and 1850s, including the Model 1847 Cavalry Carbine, Model 1855 Rifled Carbine and Model 1855 Pistol-Carbine. All subsequent American carbines, however, both those made by Springfield and those bought from other makers, were loaded from the breech. The Sharps, Joslyn, Maynard and Burnside carbines were the most procured in the 1850s, but Jenks, Colt, Perry, Greene and Merrill carbines were also bought in small quantities for testing. By the start of the Civil War, the Army hadn't yet settled on a final carbine design - deliberations that were soon overtaken by events.

The first practical metallic cartridges were also developed in the 1850s. As the war progressed, the technology improved rapidly. At the start of the war, only the Spencer fired a metallic cartridge; by the end of the war they were used in eleven of the twenty carbines procured by Ordnance. The Army completed the transition from 1867 to 1869, converting over 31,000 Civil War Sharps percussion carbines to fire the .50-70 metallic cartridge.

Development of metallic cartridges was a technological advance of major consequence. Among other effects, it made possible the development of repeating firearms like the Henry and Spencer. While those two guns played critical roles in hastening the defeat of the Confederacy, and proved the superiority of repeating firearms, a multi-shot carbine wouldn't be adopted by the Army until the bolt-action Hotchkiss was put into service in 1879.

## Arming the U.S. Cavalry

Prior to June 1861, the Army bought around 35,176 carbines of eleven different brands (Table 1). It also manufactured - either at or through the Springfield Armory and Harpers Ferry Armory - 15,973 carbines. In 1855, the War Department ordered the 1st and 2nd Cavalry Regiments armed with carbines as follows.<sup>5</sup>

- Springfield Model 1855 Rifled Carbine (three squadrons of each regiment)
- Springfield Model 1855 Pistol-Carbine (one squadron of each regiment)

- Merrill, Latrobe & Thomas Carbine  
(one squadron of the 1st Regiment)
- Perry Carbine  
(one squadron of the 2nd Regiment)

None of the Merrill, Latrobe and Thomas carbines were accepted by Ordnance, however, and the 200 Perry carbines were never even manufactured. Some regulars were still armed with Hall carbines and musketoons, but Sharps carbines were delivered in quantity starting in April 1856. They were quickly issued to the field and just as quickly proved their worth.

At the start of the Civil War, Ordnance listed its stock of arms as 437,433 rifles and muskets and 4,076 carbines<sup>7</sup> - carbines making up less than one percent of the total. This number must reflect only arms in active service, however, since at least 5,000 Model 1843 Hall carbines were still in arsenal storage and another 817 Model 1836 Hall carbines were also in storage at various military institutions. The precise composition of the carbines in active service at the outbreak of the war isn't known, but it overwhelmingly consisted of Sharps carbines. The four U.S. cavalry units that existed at that time were armed as follows<sup>2</sup>:

- 1st Dragoons:* Model 1853 Sharps carbines
- 2nd Dragoons:* Model 1853 and New Model 1859 Sharps carbines
- 1st Cavalry:* New Model 1859 Sharps and 1st Model Maynard carbines
- 2nd Cavalry:* New Model 1859 Sharps carbines

Ordnance had accepted 5,540 Sharps carbines since February 1858 in sixteen different deliveries. Four hundred Maynard carbines had also been procured, as well as 892 Burnside carbines.<sup>8</sup> Still in inventory were a number of Springfield Pistol-Carbines; these were actively used in the Civil War, and 398 remained in inventory at the end of 1862.<sup>2</sup>

The attack on Ft. Sumter in April 1861 was a wakeup call, but the Union debacle at First Manassas (Bull Run) in July 1861 catalyzed an explosion in carbine design and procurement. After the battle, as both sides realized they were facing a long and bloody war, Ordnance began buying up almost any carbines they could find both in America and Europe.<sup>9</sup> At the same time, arms designers and manufacturers rushed to create new breechloading systems that could meet the demands of the civilian and military markets. In nearly all cases the carbines were patented, and those who held the patents had exclusive rights to their manufacture.<sup>7</sup> Many of the guns also fired proprietary ammunition, which for those successful in winning military contracts could guarantee very lucrative sales in addition to the value of the original firearms contracts.

As warfare tactics evolved, the value of mounted cavalry gradually became clear. A shortage of men suited for cavalry duty, however, led to the creation of a few mounted infantry units starting in 1862.<sup>9</sup> Meanwhile the demand for carbines grew dramatically. By the end of the war, Ordnance had tested around sixty-five brands of breechloading carbines<sup>10</sup> and bought almost 400,000 of them.

While the U.S. government had manufactured almost 16,000 carbines by the outbreak of hostilities (Table 1), it actually made no carbines at all during the Civil War. The Harpers Ferry Armory was knocked out of production by Confederate forces in April 1861, and Springfield Armory ran at full capacity throughout the

war making muskets for the infantry. Consequently, all of the U.S. carbines bought by Ordnance during the war were obtained from U.S. manufacturers and suppliers.<sup>11</sup>

## PART II - DATA SOURCES AND LIMITATIONS

This analysis includes the twenty brands of U.S. production carbines bought by the U.S. Ordnance Department from January 1, 1861 through June 30, 1866 (Table 2). Not included are the 4,076 carbines in service before January 1, 1861; foreign-made carbines; carbines bought only for testing or limited trial use and carbines procured by the Navy. Because they aren't listed in official Ordnance procurement inventories, carbines bought by individual soldiers and militia units during the Civil War, and by states like Kentucky and New York for state militia units, are also not included. These were significant markets, and they bought substantial numbers of Ballard, Maynard, Sharps & Hankins, Smith, Spencer, Triplett & Scott, Wesson and other carbines during the war. Information on some of the more important of these procurements is presented in the individual carbine entries in Part IV.

Ordnance bought 397,865 carbines during the war. As of June 30, 1866, fourteen months after Appomattox, 230,040 of them were still accounted for - either in storage, taken home by soldiers who bought them as they mustered out, already sold or still issued to the troops. This generates a known Civil War survival rate of 57.8% for all twenty carbine brands combined. Survival rates varied from a low of 26.3% for the Hall, to a high of 100% for the Ball carbine.

**Core Databases.** Calculation of the Civil War survival rates for the carbines is based on four core databases. All were published by the Ordnance Department, all are congruent in terms of timing and they each cover all twenty of the subject carbine brands. The data sets are:

- Number procured from January 1, 1861-June 30, 1866<sup>12</sup>
- Number stored as of June 30, 1866<sup>13</sup>
- Number issued to troops as of June 30, 1866<sup>14</sup>
- Number taken home after the Civil War by soldiers mustering out<sup>15</sup>

A fifth data set, compiled by McAulay from Ordnance data, covers Ordnance-procured U.S. carbines sold from stores before June 30, 1866.<sup>6</sup>

**Procurement Data.** This analysis uses data from Executive Document #9912 of the 40th Congress, 2nd Session, dated January 14, 1868, as compiled by McAulay<sup>8</sup>, as the core procurement database. It details documented Ordnance procurements during the subject period, it's the most thorough and recent analysis of Ordnance procurement data and it uniquely provides defensible procurement numbers for both the Sharps & Hankins carbine and Hall carbine. One problem, however, is that it doesn't capture all of the smaller carbine procurements. Some of the more important of those, including for Sharps, Burnside and Hall carbines, are discussed in the individual carbine entries.

**Storage Data.** Data on the number of carbines stored as of June 30, 1866 are reported by McAulay in his *Carbines of the U.S. Cavalry, 1861-1905*.<sup>2</sup> These data may include some of the 4,076 carbines that were on hand prior to January 1861, which constituted about one percent of total Civil War carbine procurement.

**Table 1. U.S. Ordnance Department, Pre-Civil War U.S. Carbine Purchases and Manufacturing (Through June 1861).**

| Brand                                   | Number | Notes   |
|---|--------|---|
| <b>Ordnance-Procured Carbines</b>       |        |   |
| Burnside                                | 892    | Includes 290 delivered May 1861.  |
| Colt Model 1839                         | 100    | An additional 160 were procured by the U.S. Navy.   |
| Colt Model 1855                         | 70     | 66 Artillery Carbines and 4 Cavalry Carbines  |
| Colt Pistol-Carbines                    | 936    | Dragoons with shoulder stock; procurements pre-1861   |
| Greene                                  | 200    | U.S. Model only.  |
| Hall-North                              | 24,164 | Models 1833, 1840 and 1843; includes ~5,000 Model 1843 "Hall Affair" carbines rifled at the start of the Civil War. See additional Hall carbines below. |
| Jenks                                   | 44     | U.S. Ordnance Dept. procurement only.   |
| Joslyn                                  | 350    | All are Model 1855 "monkeytail" carbines.   |
| Maynard                                 | 400    | All are 1st Model. Excludes pre-war procurements by Treasury (200), the Navy (60), and state militias (about 2,490)                                     |
| Merrill, Latrobe & Thomas               | 0      | 170 ordered; none accepted.   |
| Perry                                   | 50     | All are carbines accepted by the Navy; 200 carbines ordered by the Army were never manufactured.  |
| Sharps                                  | 7,940  | Includes all models procured through 1860.  |
| Schroeder                               | 10     | 1860 needle fire trials gun; found unsuitable for service.  |
| Symmes                                  | 20     | Only 20 delivered against a contract of 200.  |
| Total Carbines Bought:                  | 35,176 |   |
| <b>U.S. Army-Manufactured Carbines</b>  |        |   |
| Springfield M1807 Indian Carbine        | 1,201  | The 1st American carbine. Muzzleloader.   |
| Harper's Ferry M1836 Hall               | 2,020  | Breechloader  |
| Harper's Ferry M1842 Hall               | 1,001  | Breechloader  |
| Springfield M1847 Cavalry Carbine       | 6,703  | aka Springfield Cavalry Musketoon. Muzzleloader.  |
| Springfield M1855 Rifled Carbine        | 1,026  | Muzzleloader.   |
| Springfield M1855 Pistol-Carbine        | 4,022  | Muzzleloader.   |
| Total Carbines Manufactured:            | 15,973 |   |
| Total Carbines Bought and Manufactured: | 51,149 |   |

Primary Sources: McAulay<sup>6,8</sup>; Moller<sup>62</sup>; Flayderman<sup>3</sup>.

Notes: Does not include: 100 flintlock Jenks Musketoons ordered by the Army in 1839 and delivered in 1840<sup>62</sup>; Springfield M1847 Artillery musketoons; or Springfield M1847 Sappers & Miners musketoons.

**Number Taken Home.** In an effort to stop deserters from absconding with government arms at the end of the war, on June 5, 1865 the Ordnance Department issued *Circular No. 13, Series of 1865*<sup>17</sup> to authorize the sale of personal arms to soldiers who were mustering out.<sup>18</sup> The numbers of carbines actually sold were reported to Congress in 1872. These data are found in Exhibit 13 of Report No. 183, “*Sale of Arms by Ordnance Department*,” in the 1872 “*Reports of the Committees of the Senate of the United States for the Second Session of the 42nd Congress, 1871-1872*”.<sup>15</sup> That table details the sales of eleven brands of American carbines to enlisted personnel at the end of the war - Spencer, Sharps, Burnside, Maynard, Smith, Starr, Joslyn, Merrill, Gallagher, Warner and Cosmopolitan. A total of 13,473 carbines, or about 5.9% of the total number of survivors, were sold (Table 2). The soldiers who bought them consisted of enlisted men from thirty-five states, including former Confederate states, plus twenty-six guns that were sold to the Signal and Ambulance Corps, Veteran Reserve Corps, United States volunteers, United States Colored troops and miscellaneous buyers.

**Sales Before June 30, 1866.** This analysis uses Ordnance sales data from ExDoc-99 as reported by McAulay<sup>6</sup> for the number of carbines sold commercially by Ordnance prior to June 30, 1866 (Table 2). These six sales totaled 2,611 carbines, or about 1.1% of the total number of known survivors. They reflect very low initial demand for carbines after the end of the war; ten of the twenty brands saw zero sales from Ordnance in the following two years. The sales were:

- An unspecified location in 1865
- Harpers Ferry Armory in September 1865
- The Ordnance Department in November 1865
- The Allegheny Arsenal on January 18, 1866
- Harpers Ferry Armory on February 27, 1866
- The Ordnance Department on May 26, 1866

**Number Still Issued to the Troops.** The number of carbines recorded as issued to the troops as of June 30, 1866 comes from two sources. Data for the six regular U.S. cavalry regiments (72 companies) are Ordnance records enumerated by regiment and station in Table 1.1 in Farrington’s *Arming & Equipping the U.S. Cavalry 1865-1902*.<sup>14</sup> Farrington notes that summary documents were entirely neglected during 1865, and only sporadically compiled in 1866 and 1867. The June 1866 statistics are “the only summary statement extant for 1866.” Slightly different numbers for the regular cavalry in June 1866 are reported by McAulay.<sup>2</sup>

To the regular cavalry numbers are added data for volunteer regiments and independent cavalry battalions from McAulay.<sup>2</sup> Since he notes that the data are “from a few of the units,” these numbers are not considered complete.

**Survival Rate Calculations.** The Civil War survival of carbines in U.S. Government hands is calculated for each of the twenty carbine brands as the sum of

$$\begin{aligned} & \text{(# stored)} \\ & + \text{(# taken home)} \\ & + \text{(# sold pre-6/30/66)} \\ & + \text{(# still issued on 6/30/66)} \end{aligned}$$

The survival rate statistic is then calculated as

$$\begin{aligned} & \text{(# of total survivors)} \\ & \times 100 / \text{(# procured)} \end{aligned}$$

The overall calculated survival rate for the twenty Civil War carbine brands is about 57.8%. Losses amounted to about 167,833 carbines; over half of these, 93,394 guns were damaged, destroyed or lost in battle in 1864 alone<sup>2</sup>. Factors affecting the survival rates of the individual carbine brands are discussed in their respective entries.

**First Delivery.** For consistency, this analysis uses the month and year of first delivery to Ordnance - data available for all twenty carbines - as the best indicator of time in service. It’s used as a proxy because data on *actual* first issuance to the troops is both anecdotal and unavailable for all twenty brands. First delivery dates are taken from McAulay<sup>8</sup>. In federal procurement, the date of purchase isn’t the contract date; it’s the date of actual acceptance after delivery and inspection. The lag time between the contract date and delivery date varied considerably, from zero (e.g., Gallagher) to a year or more (e.g., Gibbs). Also, the date of first delivery doesn’t always correspond to the date the carbines were actually issued to the troops. In some cases, like with Sharps and Spencer, issuance was mostly continuous. In other cases, like with the Ballard, the delay could be weeks or months; in a few cases near the end of the war, carbines were delivered too late for issuance to the troops at all (Ball, Palmer, Type II Remington).

**Post-War Disposal.** Of the 230,040 carbines that survived the war, 213,956 (93.0%) were still either stored or issued as of June 30, 1866. Almost all of the Sharps and many of the Spencer carbines were converted after the war for use by federal troops in the westward expansion and the Indian Wars. By the mid 1870s, those had mostly been replaced and either been sold or gone into storage. Disposal of Ordnance carbines in storage occurred through abandonment, destruction, local donations, local sales and large arsenal sales.<sup>19</sup> The vast majority of Civil War carbines were sold on the open market. McAulay writes that

*“Within five months of Lee’s surrender in April of 1865, the Ordnance Department started to dispose of its vast quantities of carbines in arsenal storage and those being turned in by the cavalry as they were mustered out of federal service. Over the next 40 years, more than 200,000 carbines were sold on the market by the government...”*

*“At the turn of century, nearly half of all carbines in storage as of 1866 were still in storage. In 1901, the government made a constituted (sic) effort to clear their inventory of these obsolete arms. By years end, over 90,000 carbines had been disposed of. Two-thirds of the entire (1901) sales occurred in June, when over 62,000 sold from the New York Agency.”<sup>2</sup>*

This analysis relies on sales data reported by McAulay<sup>2</sup>, supplemented by Dorsey,<sup>19</sup> as the best available rackup of post-Civil War carbine sales data. These sources account for 198,274 carbines sold by the end of 1901, when the entire remaining U.S. Civil War carbine inventory was effectively liquidated. This is about 92.7% of the 213,956 carbines stored or still issued to troops as of June 1866.

**Carbine Quality.** Most carbine entries discuss carbine quality, since quality could and did significantly affect the survival of many of the twenty brands. These summary assessments are based on three sources. First are reports from the field, primarily qualitative, as reported in some detail by McAulay.<sup>20</sup> Second is a qualitative source described as “the most generally correct and empirically verifiable ranking”.<sup>21</sup> It was

*“compiled by ordnance officers attached to the command of Brigadier General James H. Wilson, cavalry commander under General William Tecumseh Sherman. Wilson ordered a review of all equipment from saddles to tents to weapons. The objective was to rationally and correctly condemn useless military stores...By February 1864 all arms included in Wilson’s classification had been thoroughly tested in battle. Wilson’s officers looked closely at figures for arms turned in to arsenals for repairs, reports of ordnance officers in the field at the corps, regimental, and battalion levels. These statistical reports were augmented by statements of Officers regarding failure of carbines to perform under all field conditions and circumstances.”*

Carbines were classified in three categories according to effectiveness, tendency to break or otherwise become inoperable, and overall value to the men who actually used them and to the army generally. Fourteen of the twenty carbines procured by Ordnance were ranked, in addition to the Colt revolving carbine. The results were:

- *The Worst Carbines:* Burnside, Maynard, Warner, Joslyn, Starr, Gallagher, Gibbs and Colt.
- *Useful But Not Superior Carbines:* Ballard, Sharps, Smith, Merrill, Hall and Union (Cosmopolitan/Gwyn & Campbell).
- *Superior Carbines:* Spencer.

The third source, the only quantitative proxy for carbine quality, is the calculated percentage of surviving carbines that were taken home by troops who were mustering out—and who thought highly enough of the carbine they carried at war to actually pay for them. These eleven carbines, and their respective percentages as calculated from the raw numbers in Senate Report 183<sup>15</sup>, were:

| Brand        | # Taken Home | % of Survivors |
|--------------|--------------|----------------|
| Spencer      | 8,289        | 12.9%          |
| Sharps       | 2,549        | 7.6%           |
| Maynard      | 871          | 5.7%           |
| Smith        | 695          | 3.7%           |
| Joslyn       | 177          | 3.2%           |
| Burnside     | 392          | 1.7%           |
| Starr        | 266          | 1.7%           |
| Warner       | 36           | 1.3%           |
| Gallagher    | 165          | 1.2%           |
| Merrill      | 25           | 0.4%           |
| Cosmopolitan | 8            | 0.1%           |
| Other Brands | 0            | 0.0%           |

**Caliber Data.** There is enormous inconsistency in the calibers reported in the literature for many if not most of the twenty carbines. This analysis uses the calibers for those carbines that were actually procured by Ordnance during the Civil War. Primary sources of caliber data used here are Flayderman<sup>3</sup> and Thomas.<sup>22</sup>

### PART III - UNACCOUNTED FOR CARBINES

Three groups of carbines procured by Ordnance during the Civil War are not accounted for in the survival rate calculations. These are unlisted carbines on hand in 1868, deserter carbines and Confederate captured and collected carbines.

**Un-Listed Carbines on Hand in 1868.** An Ordnance list of carbines on hand as of early 1868 includes both the number in the hands of troops and the number in storage.<sup>24</sup> While the list includes all twenty of the major carbines procured during the war, it also includes five brands of U.S. carbines not found on the two principal procurement lists.<sup>25</sup> Totalling 42 guns, these are the Allen carbine in .52 caliber (27 guns); Brooke’s carbine (1); the Greene carbine in .546 caliber (12); Henry’s carbine in .44 caliber (1); and North’s carbine in .44 caliber (1).

**Deserter Carbines.** The second group consists of service carbines that were taken by Union soldiers who permanently abandoned their posts.<sup>26</sup> Desertions occurred throughout the war, and in the months immediately after with the transition to peacetime duty.<sup>18</sup> Civil War desertion statistics are notoriously imprecise.<sup>27</sup> This estimate of about 20,000 is based on a figure of 300,000 who served in the Union cavalry and mounted infantry during the war<sup>9</sup>; a desertion rate of 10%<sup>27</sup>; and about a third of the deserters who returned to duty, either voluntarily or not.<sup>27</sup> The number 20,000, about 5.0% of total carbine procurement, is a hypothetical *maximum*. It assumes that all mounted deserters took their carbine with them; that all who returned came back with the carbines they took; and that the cavalry desertion rate was the same as for infantry and artillery units.

**Confederate Captured and Collected Carbines.** The third group of unaccounted for carbines consists of those that were captured and collected by the Confederacy and survived the war. This source is potentially significant for certain brands, as discussed in the individual carbine sections. Gorgas<sup>28</sup> reported in 1883 that about 150,000 arms were recovered from the battlefield and put in good order. More recently, based on surviving military reports, Knott<sup>29</sup> concludes that no fewer than 200,000 guns were captured and collected by the Confederacy and entered into the C.S.A. cleaning and repair system. How many of these are carbines can be roughly estimated in two ways. First, only 17.3% of the 2,301,605 rifles, muskets and carbines purchased by Ordnance during the war<sup>30</sup> were carbines. Assuming that the number of carbines captured and collected was proportional to total procurement, then about 17.3% of 200,000 captured and collected guns, or about 34,600, were carbines. Second is Knott’s estimate<sup>31</sup> that he sees about one C.S.A.-marked cleaned and repaired carbine for every seven other long arms. This ratio of 1:7, or 12.5%, generates an estimated total of 25,000 carbines captured and collected. The range 25,000-35,000 is therefore adopted here as a rough estimate of the number of Confederate captured and collected carbines.

The number of Union carbines that fell into Confederate hands and survived the war is more speculative. Applying the overall Union survival rate of 57.8%, no more than about 15,000 to 20,000 survived. This estimate, about 5.0% or less of total Ordnance procurement, is also probably very high. That’s because of both the very high attrition of carbines that were recycled into battle during the war, and the very high attrition of carbines that were in C.S.A. storage at the end of the war. The Richmond and Selma arsenals were destroyed, as were the Danville and Lynchburg arsenals and Staunton Supply Depot where C.S.A. captured and collected carbines were repaired.<sup>29</sup> At Columbia, Sherman’s troops kept what they wanted of the vast stores of Southern ordnance and dumped the rest in the Congaree River.<sup>32</sup>

**Table 2. Civil War Carbine Survival Rates. U.S. Ordnance Department Procurements from January 1, 1861 - June 30, 1866.**

| <b>A</b>   | <b>B</b>   | <b>C</b>              | <b>D</b>                   | <b>E</b>             | <b>F</b>                 | <b>G</b>          | <b>H</b>       | <b>I</b>                |
|--|------------|-----------------------|----------------------------|----------------------|--------------------------|-------------------|----------------|-------------------------|
|  | Formula    | C+                    | D+                         | E+                   | F=                       | G                 | Survival Rate  | 1st Delivery Month/Year |
|  | # Procured | # Stored at 6/30/1866 | # Taken Home at End of War | # Sold Pre-6/30/1866 | # Issued as of 6/30/1866 | # Known Survivors |                |                         |
| <b>Low Survival Rate (Under 50%) 1st Delivery: 1861</b>        |            |                       |                            |                      |                          |                   |                |                         |
| Hall   | 6,059      | 1,227                 | 0                          | 368                  | 0                        | 1,595             | <b>26.32%</b>  | Aug 1861                |
| Lindner  | 892        | 344                   | 0                          | 0                    | 0                        | 344               | <b>38.57%</b>  | Nov 1861                |
| Burnside   | 53,031     | 22,273                | 392                        | 4                    | 0                        | 22,669            | <b>42.75%</b>  | Oct 1861                |
| Sharps   | 77,330     | 27,878                | 2,549                      | 0                    | 3,127                    | 33,554            | <b>46.54%</b>  | Sep 1861                |
| Merrill  | 15,255     | 7,016                 | 25                         | 59                   | 0                        | 7,100             | <b>46.54%</b>  | Nov 1861                |
| Gibbs  | 1,052      | 518                   | 0                          | 2                    | 0                        | 520               | <b>49.43%</b>  | May 1863*               |
| Joslyn   | 11,261     | 3,949                 | 177                        | 2                    | 1,474                    | 5,602             | <b>49.75%</b>  | Jun 1861                |
| <b>Moderate Survival Rate (50-90%) 1st Delivery: 1862-1864</b> |            |                       |                            |                      |                          |                   |                |                         |
| Sharps & Hankins   | 1,468      | 800                   | 0                          | 0                    | 0                        | 800               | <b>54.50%</b>  | Sep 1862                |
| Gallager   | 22,728     | 12,719                | 165                        | 673                  | 0                        | 13,557            | <b>59.65%</b>  | Aug 1861*               |
| Starr  | 25,602     | 14,385                | 266                        | 521                  | 417                      | 15,589            | <b>60.89%</b>  | Jul 1863                |
| Smith  | 31,002     | 17,478                | 695                        | 738                  | 0                        | 18,911            | <b>61.00%</b>  | Jan 1862                |
| Cosmo/G&C  | 9,342      | 4,995                 | 8                          | 243                  | 1,000                    | 6,246             | <b>66.86%</b>  | Jun 1862                |
| Spencer  | 95,181     | 55,005                | 8,289                      | 0                    | 1,048                    | 64,342            | <b>67.60%*</b> | Oct 1863                |
| Warner   | 4,001      | 2,824                 | 36                         | 0                    | 0                        | 2,860             | <b>71.48%</b>  | Mar 1864                |
| Maynard  | 20,002     | 14,400                | 871                        | 0                    | 121                      | 15,392            | <b>76.95%</b>  | Jun 1864                |
| Wesson   | 151        | 51                    | 0                          | 0                    | 0                        | 51                | <b>84.11%*</b> | Jul 1863                |
| Ballard  | 1,509      | 1,304                 | 0                          | 0                    | 0                        | 1,304             | <b>86.41%</b>  | Mar 1864                |
| <b>High Survival Rate (90-100%) 1st Delivery: 1865</b>         |            |                       |                            |                      |                          |                   |                |                         |
| Remington  | 19,999     | 17,604                | 0                          | 1                    | 0                        | 17,605            | <b>95.00%*</b> | Mar 1865                |
| Palmer   | 1,000      | 999                   | 0                          | 0                    | 0                        | 999               | <b>99.90%</b>  | Jun 1865                |
| Ball   | 1,000      | 1,000                 | 0                          | 0                    | 0                        | 1,000             | <b>100.00%</b> | May 1865                |
| Total Carbines:  | 397,865    | 206,769               | 13,473                     | 2,611                | 7,187                    | 230,040           | 57.82%         |                         |

Sources:

**Carbine Brand (Column A)**

# Procured (Column B): Executive Document 99<sup>12</sup> as reported by McAulay.<sup>8</sup>

# Stored (Column C): Ordnance data as reported by McAulay.<sup>2</sup>

# Taken Home (Column D): SR-183<sup>15</sup>.

# Sold Pre-6/30/1866 (Column E): Ordnance data as reported by McAulay.<sup>2,6</sup> Does not include carbines sold to troops mustering out of service at the end of the war.

# Issued at 6/30/1866 (Column F): Ordnance data as reported by Farrington<sup>63</sup> in Table 1.1.; McAulay.<sup>2</sup>

Known Survivors (Column G): = (stored) + (taken home) + (sold pre-6/30/1866) + (still issued).

Known Survival Rate (Column H): = (Survivors) x 100/# Procured (Column B). See text for anomalous Spencer, Wesson and Remington carbines.

Month and Year of 1st Delivery (Column I): McAulay<sup>8</sup>, as amended (see text). See text for anomalous Gibbs and Gallager carbines.

Notes: Does not include carbines taken by deserters, or Confederate captured and collected carbines. See text.

(\*): Anomaly. See text for details.

(Italics): Anomaly. See text for details.

While the cavalrymen who surrendered at Appomattox stacked their arms, many who later surrendered did not. In the chaos that ensued in the months after Appomattox, large numbers of them deserted with their firearms instead of surrendering.<sup>33</sup> Some returned home with their guns, some abandoned them along the way, and some surrendered later either with - or often without - their carbine. In one case, Union Col. Marcus Reno reported paroling 1,465 cavalry over the course of several days but collecting only sixty-six carbines.<sup>33</sup>

*“Reno was not surprised at the low numbers of guns surrendered—paroled Confederates wanted to assure themselves of some form of protection. . . as the landscape seemed infested with deserters who commit depredations upon the citizens and travelers.”*

Those cavalry arms collected at Appomattox, Bennett Place and elsewhere were mostly shipped north to the Ordnance Department. Of those, most of the ones that were originally procured by Ordnance were probably accounted for as “in storage” in the June 1866 Ordnance rackup.<sup>12</sup> These were auctioned off later, finding their way into the hands of firearms dealers on the American frontier, foreign forces in Europe, Asia and Latin America and after 1900 into the hands of American collectors.

Interestingly, some also found their way to the Springfield Armory where they formed the basis of Springfield’s Civil War collections;<sup>34</sup>

*“Most of these weapons were added to the collection in the first six months of 1866 from former Confederate arsenals on orders of the US Ordnance Department. A large proportion of the cache is made up of former Federal weapons stored in Southern arsenal(s) prior to the war, battlefield pick-ups, and captures.”*

Large volumes of “old guns and scrap” - 214,458 pounds in one sale in April 1869<sup>35</sup> - were also auctioned off after the war. Many if not most of the guns recovered from the Confederacy were also sold as scrap.<sup>35</sup> Persico writes that:

*“The federal government had a practice of smashing surplus arms under heavy hammers before auctioning them. This destruction scandalized Bannerman: ‘We remember at the close of the Civil War, making the highest bid at Government sale, on a lot of 11,000 old guns, veterans of many wars, part of the lot surrendered by General Lee, classified as “Rebel.” The U.S. Ordnance Officer refused to accept our bid for the guns, alleging ‘that Bannerman would repair the guns and put them into serviceable order, and they would then enter into competition with the now obsolete guns that the Government had for sale.’ So this lot of “Rebel” guns, which contained many heirlooms of patriots who had fought with Washington and Jackson, was consigned to the fire, and the old burnt locks and barrels sold to us later as scrap iron.”<sup>36</sup>*

The extent to which the guns surrendered by Lee at Appomattox included Ordnance-procured carbines isn’t known.

#### **PART IV - CARBINE SERVICE AND SURVIVAL DESCRIPTIONS**

This section individually discusses the Civil War survival rates of the twenty American production carbines procured by Ordnance from 1861-1866. Each entry describes the carbine, procurement,

first and last delivery, Civil War service, Civil War survival rate, carbine quality, use by the Confederacy and post-war disposal. Data on the number of carbines procured, stored, sold to soldiers mustering out, sold before June 1866, still issued to the troops and known survivors track the data in Table 2. Survival rates in the text are rounded off to the nearest tenth of a percent. Carbines are listed in alphabetical order.

**Triage by Survival Rate.** The twenty carbine brands are triaged into three categories (Table 2): *low survival rate carbines* (0-50%); *moderate survival rate carbines* (50-90%) and *high survival rate carbines* (90-100%). The best predictor of survival rate is the date of first delivery, using data from McAulay.<sup>8</sup> While not perfect, this metric is the best available proxy for time in service; the earlier a brand was delivered, the longer it typically served in the field and the higher the losses incurred. The few exceptions to, and variances from, this pattern are discussed in the individual carbine entries. Although large numbers of some carbines were never issued during the war, the pattern tracks fairly well. Low survival rate carbines were first delivered in 1861; moderate survival rate carbines from 1862-1864; and high survival rate carbines in 1865 or 1866 (Table 2). Two carbines that don’t fit this pattern are the Gibbs and Gallagher. For three others, the Remington, Warner and Wesson carbines, survival rates are calculated taking into account extenuating factors. These anomalies are marked with an asterisk (\*). The reasons are unique to each model, and discussed under the respective carbine entries.

*Low Survival Rate Carbines.* These include seven brands: the Hall, Lindner, Burnside, Sharps, Merrill, Gibbs and Joslyn. With one exception, the Gibbs, these guns were all first delivered in 1861. In almost all cases, the low survival rate reflects early entry into the war and extended use during the war. Survival rates in this category vary from a low of 26.3% for the Hall carbine, to a high of 49.8% for the Joslyn.

*Moderate Survival Rate Carbines.* These include ten brands with rates of from 50%-90%: the Sharps & Hankins, Gallagher, Starr, Smith, Cosmopolitan (Gwyn & Campbell), Spencer, Warner, Wesson, Maynard and Ballard. These guns all saw extensive action in the Civil War, but with the exception of the Gallagher - 200 were delivered in 1861 - they missed the first year of the war; first delivery occurred in 1862, 1863 or 1864. The survival rates in this category vary from a low of 54.5% for the Sharps & Hankins, first delivered in September 1862, to a high of 86.4% for the Ballard, which was first delivered in March 1864.

*High Survival Rate Carbines.* These include three brands with Civil War survival rates of over 90%: the Ball, Palmer and Remington. These guns were all contracted for in 1864, but they weren’t delivered to Ordnance until 1865. The first delivery for this category was a shipment of Remington carbines in March 1865, just before Appomattox. First delivery for the Ball was May 1865 and first delivery for the Palmer was June 1865. The very high survival rates of these guns reflect these late deliveries.

**Confederate Captured and Collected Carbines.** Each carbine entry discusses the utility of the gun to Confederate forces. As discussed in Part III, large numbers of carbines - an estimated 25,000 to 35,000 - were captured and collected by the C.S.A. and put through its cleaning and repair system. The carbine brands weren’t affected equally. They weren’t lost at the same rate, and the likelihood of some brands being recycled into action was much

**Table 3. Ammunition Used by U.S. Ordnance-Procured Civil War Carbines**

## Type of Ammunition

| Carbine Brand    | Caliber       | Percussion Ignition with Cap           |  | Internally Primed<br>Metallic Cartridge                             | No. of CSA<br>Cavalry Units<br>Known to Use |
|------------------|---------------|--|--|---|---|
|                  |               | Combustible<br>(Linen, Paper, Skin...) | Unprimed<br>Non-Combustible                          |   |   |
| Ball             | .50           |  |  | Spencer .56-50; .50 Ball RF   |   |
| Ballard          | .42           |  |  | #44 Long RF   | 3   |
| Burnside         | .54           |  | Metallic unprimed                                    |   | 24*   |
| Cosmo/G&C        | .52           | Paper or Linen                         |  |   | 6   |
| Gallager         | .54; .50; .52 |  | Brass unprimed (.54);<br>brass or paper & foil (.50) | Spencer .56-56 (.52)  | 3   |
| Gibbs            | .52           | Paper                                  |  |   |   |
| Hall             | .58; .52      | Paper (converted<br>and unconverted)   |  |   | 10*   |
| Joslyn           | .54; .52      | Paper or linen (.54)                   |  | Spencer .56-56 (.52)  |   |
| Lindner          | .58           | Paper                                  |  |   |   |
| Maynard          | .50           |  | Metallic unprimed                                    |   | 15*   |
| Merrill          | .54           | Paper or Linen                         |  |   | 18*   |
| Palmer           | .50           |  |  | Spencer .56-50  |   |
| Remington        | .44; .50      |  |  | Large frame: Spencer .56-50.<br>Small frame: #46 Long RF (.44 cal.) |   |
| Sharps           | .52           | Paper or Linen                         |  |   | 47*   |
| Sharps & Hankins | .52           |  |  | S&H .56-56  |   |
| Smith            | .50           |  | Rubber; paper & foil                                 |   | 13  |
| Spencer          | .52; .50      |  |  | Spencer .56-56 (.52);<br>Spencer .56-50 (.50)                       | 15  |
| Starr            | .54; .52      | Linen (.54)                            |  | Spencer .56-56 (.52)  |   |
| Warner           | .515; .52     |  |  | .515 Warner RF;<br>Spencer .56-56 (.52)                             |   |
| Wesson           | .42           |  |  | # 44 Long RF (.42 cal.)   |   |

Primary Sources: Flayderman<sup>3</sup> ; Thomas.<sup>39</sup>

No. of C.S.A. Units Known to Use: McAulay.<sup>2</sup>

Asterisk (\*): Listed or mentioned in *CSA Field Manual for the Use of Officers on Ordnance Duty*.<sup>46</sup>



higher than for others depending on the availability of ammunition. Ammunition for these carbines was of three basic types (Table 3). The first consisted of combustible envelope cartridges of linen, paper, skin or other material that was ignited with a percussion cap. The second consisted of non-combustible cartridges with a perforated base to admit the flame from a percussion cap. And the third consisted of metallic rimfire cartridges that were internally primed and required no percussion cap.<sup>10</sup>

Percussion carbines were of special utility to the C.S.A. An 1862 Confederate *Field Manual for the Use of Officers on Ordinance Duty*<sup>46</sup> specifically lists the Hall, Burnside, Sharps and .35

caliber Maynard as “*in our service,*” along with a mention of the Merrill.<sup>37</sup> Conversely, the utility of the eleven metallic cartridge carbines was limited by the availability of ammunition that those guns could fire (Table 3). An anomaly is the Spencer carbine, used by at least fifteen C.S.A. cavalry regiments.<sup>2</sup> These were highly valued firearms, but they could only fire captured Spencer ammunition. The ammunition supply problem for them was so dire that in one case, the 8th Texas Cavalry quit collecting Spencer rifles and carbines from the battlefield altogether.<sup>22</sup> The Confederacy tried to start manufacturing Spencer ammunition in 1865, but the war ended before production could get off the ground.



### **Ball Carbines - Survival Rate = 100.0%**

The Ball was an advanced, .50 caliber repeating breechloading carbine that fired the .56-50 Spencer cartridge. It was the only repeating long arm in the U.S. arsenal at the time except for the Spencer and Henry rifle.<sup>11</sup> The carbine could load either seven Spencer cartridges or twelve short .50 caliber Ball rimfire cartridges. Ordnance records list 1,000 Ball carbines purchased, all of them delivered in May 1865.<sup>8</sup> Others put total procurement at 1,002.<sup>38</sup> The June 1864 contract called for delivery by January 1865, but as with the Palmer carbine it was delayed because of a change in specified caliber from .44 rimfire to the .50 caliber Spencer cartridge.<sup>39</sup> Both carbines were made by the same company, E.G. Lamson, in Windsor, Vermont.

The 100.0% survival rate of the Ball carbine includes all 1,000 guns in storage as of June 30, 1866. None were taken home, none had been sold by June 1866, and none were in the hands of U.S. troops (Table 2). This is the only carbine of the twenty procured by Ordnance that had a perfect Civil War survival rate. The Ball carbines were kept in storage at the New York Arsenal until October 1870, when they were offered for sale along with ammunition to the highest bidder. When none sold, they went back into storage. In September 1901, Marcus Hartley & Co. bought 984 Ball carbines for twelve cents each<sup>2</sup>. The fate of the other sixteen isn't known.



### **Ballard Carbines - Survival Rate = 86.4%**

The Ballard single-shot carbine fired a .42 caliber (No. 44) rimfire metallic cartridge.<sup>39</sup> In spite of relatively high quality<sup>21</sup>, recorded federal procurement was just 1,509 guns (Table 2). Three single carbines were ordered in 1863, but the first delivery of production carbines was 1,000 guns in March 1864.<sup>8</sup> Six were delivered in July and the last 500 were delivered in August. Only a small number of these Ordnance-procured carbines saw action in the Civil War. Twelve hundred were sent to Vermont in December 1864, probably to arm three state cavalry battalions that were formed after the raid on St. Albans, Vermont by a band of Confederates operating out of Canada.<sup>40,3</sup> The 2nd Iowa was issued twenty-two in March 1865, but they performed garrison duty until mustered out and it's unlikely their carbines saw combat.<sup>20</sup>

Thousands more Ballard carbines were bought independently by state militias. Kentucky bought just over 4,600 in .42 caliber and New York bought 500. Kentucky also bought about 1,000 chambered for the Spencer .56-56.<sup>23</sup> The state militia guns saw fairly extensive use during the war.<sup>20</sup> In 1865, four companies of the 13th New York Heavy Artillery that were attached to the Army's Naval Brigade were armed with Ballard carbines.<sup>2</sup> They were stationed on four steamers that operated against guerilla activity along the James River and the Atlantic coast. As of March 1865, they reported 283 on hand. Ballard carbines were also issued to the 65th and 70th New York Infantry regiments, and to the New York 1st Cavalry regiment.<sup>23</sup>

A total of 1,304 Ordnance-procured Ballard carbines are known to have survived the Civil War (86.4%). As of June 30, 1866, all of these were in storage; none had been taken home, none had been sold and none were still issued to the troops (Table 2). This is a low survival rate for a carbine that wasn't first issued to the troops until December 1864, and saw little if any actual combat. The number may be an accounting error, reflecting carbines that survived the war but were still in state hands in Vermont or elsewhere. The survival rate of 86.4% excludes an unknown number lost to deserters, as well as C.S.A. captured and collected guns. While three Confederate units are known to have been armed with captured Ballard carbines - the 3rd and 9th Texas and the 6th C.S.A. Regulars<sup>2</sup> - these were originally bought by Kentucky.<sup>23</sup>

By adding a nipple to the face of the breechblock, some Ballard carbines were able to fire either a rimfire cartridge or a combustible cartridge with a percussion cap when metallic cartridges ran out.<sup>41</sup> Even loose powder-and-ball could be used in emergencies.<sup>42</sup> These dual ignition carbines are very rare<sup>3</sup>, however, and the feature probably wasn't present on Confederate captured and collected guns. It was only produced in small numbers before 1865, and it wasn't available on either Kentucky or Ordnance-procured guns.<sup>23</sup>

Post-war sales data show 3,027 Ballard carbines sold from July 1866 through December 1901. This is over twice as many as those recorded as stored and issued as of June 30, 1866, reflecting a large number of carbines - probably from Kentucky - that must have come into Ordnance hands. There are only three sales recorded: 453 in April 1869, 1,604 in October 1882 and 970 in 1901.



### Burnside Carbines - Survival Rate = 42.8%

The Burnside carbine was a .54 caliber percussion breechloader that fired a uniquely shaped metallic cartridge ignited by a percussion cap. It was unanimously recommended by the Ordnance Board as the best suited for military service among the arms tested at West Point in August 1857<sup>10</sup>, and it was the first metallic cartridge firearm to be used by the U.S. military.<sup>41</sup> At the start of the Civil War it had been in the hands of the 1st U.S. Cavalry since 1858 and used on various expeditions.<sup>3</sup> The Burnside carbine was made in several models from about 1857-1865; all except the 1st Model were procured by Ordnance during the Civil War. It ranked second after Sharps in popularity<sup>42</sup>, and third in procurement after the Spencer and Sharps. Various sources list 55,167<sup>43</sup>, over 55,000<sup>40</sup> and 55,567<sup>44</sup> procured, but McAulay<sup>8</sup> itemizes eighty-four discrete deliveries totaling just 53,031 - the number used here. The first delivery was in October 1861, and the last was in February 1865.

Burnside carbines saw very extensive use by Union cavalry regiments in the Civil War. They were issued to over fifty units, in Illinois (9); Indiana (3); Iowa (2); Kentucky (4); Kansas (1); Maryland (1); Maine (1); Missouri (3); Michigan (1); New York (7); Ohio (3); Pennsylvania (6); Rhode Island (1); Tennessee (3); Wisconsin (2) and two U.S. Colored units<sup>2</sup>. A few infantry units were also issued Burnside carbines.<sup>41</sup>

From 1861-1863, units carrying Burnside carbines saw action at First Manassas; Washington, North Carolina; Harrisonburg; the retreat from Cedar Mountain; Aquia Creek; Brentwood, Tennessee; Brandy Station; Gettysburg; and Culpepper. Field service from 1864-1865 included action in Sherman's Atlanta campaign and march to the sea; the Dahlgren/Kilpatrick raid; Barrancas; Ashby's Gap; Millwood; Brice's Crossroads; Mine Creek, Missouri; Indian conflicts in the west; the attempt to catch Mosby's raiders out of Camp Averell; Five Forks; Berryville and guerilla skirmishes in Missouri after Appomattox.<sup>20</sup> In August 1864, Ordnance was contracting for 180,000 Burnside cartridges per week; 84,000 cartridges were expended on Sherman's 1864 Atlanta campaign, and 56,000 during his march to the sea.

A total of 22,669 Ordnance-procured Burnside carbines are known to have survived the Civil War. As of June 30, 1866, there were 22,273 in storage; four had been sold and none were still issued to the troops. A testament to its high quality, soldiers who carried it in the war took 392 home - 1.7% of all surviving specimens - when they mustered out (Table 2). The carbine's survival rate of 42.8% is the third lowest of the twenty Ordnance-procured carbines after the Hall and Lindner. It reflects both its very early first delivery in October 1861, and the extensive action it saw throughout the war. The 42.8% survival rate excludes an unknown number of Burnside carbines lost to deserters, as well as Confederate captured and collected carbines. It was the second most widely used carbine by Confederate troops. McAulay<sup>2</sup> lists twenty-four southern units that were armed with Burnside carbines, from Louisiana, Georgia, Mississippi, North Carolina, Texas, Tennessee and Virginia, as well as three regiments of the C.S.A. Regulars. He notes several captured Burnside carbines at Harrisonburg in 1862, and 107 lost from the 1864 Dahlgren/Kilpatrick raid.<sup>20</sup> After that raid,

*"large quantities of Burnside ammunition was thrown in the South River, several hundred rounds of which were retrieved from the water by the Confederates. This ammunition was requested by the unit that retrieved it for use in their Burnside carbines."*

After the encounter with Mosby's men out of Winchester in 1865, three officers and seventy-eight men were listed as missing and "Mosby added to his supply of Burnside carbines."

Post-war arsenal and Ordnance sales show 24,206 Burnside carbines sold from July 1866 through December 1901. Since those stored and issued at June 30, 1866 totaled just 22,273, over 1,900 carbines must have come into Ordnance hands from state militias or other sources after the war. Except for a single sale of 1,009 in 1873, all of the Burnside carbines in storage were sold in 1901. Marcus Hartley bought 17,109 and Francis Bannerman bought 5,320.<sup>2</sup>



### Cosmopolitan/Gwyn & Campbell Carbines -

*Survival Rate = 66.9%*

The Cosmopolitan and its successor carbines, made from about 1859-1864, were .52 caliber percussion breechloaders that fired a combustible paper or linen cartridge. They were also variously known as the Gwyn & Campbell, Grapevine, Union, Ohio, and Gross carbine.<sup>8,3</sup>

Ordnance procured a total of 1,140 Cosmopolitan carbines under that name in December 1861 for the State of Illinois. The first of these were delivered in June 1862. Most were issued to the 6th Illinois Cavalry, which carried them on the famous Grierson's Raid through Mississippi in April-May 1863 to divert Confederate attention from Grant's Vicksburg campaign. They also were used in the seizure of Port Hudson. Over 400 were issued to the 5th Illinois, which saw extensive action in Arkansas and Mississippi, in the Vicksburg campaign, and at the siege of Jackson.<sup>41,20,45</sup> The earliest report of Cosmopolitan carbines in the Civil war is of an unknown number supplied privately by Minor Milliken for Burdam's Cavalry in the summer of 1861; that unit saw action at several locations in western Virginia.<sup>45</sup> The State of Kentucky bought 320 in 1862. These were issued to the 11th Kentucky<sup>20</sup>, which saw action in western Kentucky, at the capture of Confederate raider John Hunt Morgan in Ohio and at Philadelphia, Tennessee.

Gwyn & Campbell, the successor company, made basically the same carbine in the same factory except for differences in the breechblock.<sup>45</sup> Ordnance bought 8,202 of these carbines during the war. These were first delivered in April 1863, with twelve subsequent deliveries through December 1864. They consisted of 4,200 Type I carbines delivered in 1863, and 4,002 Type II carbines delivered in 1864. The last delivery, of 500, was on December 31, 1864.<sup>8</sup> At least twenty-six cavalry regiments were issued these Type I and Type II carbines, including in Arkansas (2); Illinois (3); Indiana (2); Iowa (4); Kansas (3); Kentucky (4); Missouri (2); Ohio (4); Tennessee (1) and Wisconsin (1).<sup>41,8,45</sup> These units variously saw action west of Nashville; at Ashley's Station; around Vicksburg; in Hunter's Raid on Lynchburg; in West Virginia and at Beverly, West Virginia.<sup>20</sup>

Although categorized as "useful but not superior" by the 1864 Wilson evaluation<sup>21</sup>, the Cosmopolitan had problems. McAulay reports, for example, that after two hours of hard fighting at Beverly, West Virginia in October 1864, "*the two hundred men of the 8th found that the carbines performed so poorly that the men had to resort to their fists and the butt end of their carbines.*"<sup>20</sup> By January 1865 the Louisville Ordnance Depot had two million Cosmopolitan cartridges available, but seldom received requisitions for them. Further reflective of their quality problems is that only eight were paid for and taken home by soldiers when they mustered out of service.

A total of 6,246 Ordnance-procured Cosmopolitan and Gwyn & Campbell carbines are known to have survived the Civil War (Table 2). As of June 30, 1866 there were 4,995 in storage; eight had been taken home by soldiers mustering out, and 243 had been sold. A thousand were still issued, to the 6th U.S. Colored Cavalry in the west.<sup>2</sup> The relatively high survival rate of 66.9% - in spite of its early first delivery in June 1862 and extensive use in the war - is best explained by the fact that many were never issued. This includes most of the 4,002 Gwyn & Campbell Type II carbines. Reilly writes that "*virtually every existing specimen of the Type II...encountered today is in excellent condition, indicating that most remained in storage until after the war.*"<sup>41</sup> The survival rate of these carbines excludes an unknown number lost to deserters, as well as Confederate captured and collected carbines. McAulay mentions the capture of eighty-nine men from the 11th Kentucky in October 1863 that allowed their carbines to fall into Confederate hands, and describes the debacle at Beverly, West Virginia in January 1865 where 338 men were taken prisoner with the same result.<sup>20</sup>

Since they used a combustible cartridge ignited with a percussion cap, these carbines were of significant utility to the South. McAulay shows that those captured by Confederate forces were in use by the 19th Mississippi, 3rd, 6th, 9th and 27th Texas and 9th Tennessee.<sup>2</sup>

Post-war arsenal and Ordnance sales data account for 1,456 Cosmopolitan and Gwyn & Campbell carbines sold from June 1865 through December 1901. Just two sales are recorded: 243 out of the Allegheny Arsenal in January 1866 and 1,213 sold out of the same arsenal in November 1901.<sup>2</sup>



### **Gallager Carbines - Survival Rate = 59.7%**

The Gallager carbine ranked sixth in Civil War procurement with 22,728 purchased by Ordnance. The first contract for 200 followed quickly on the heels of the Union debacle at Bull Run in July 1861. These carbines, in .54 caliber, were an early design that was very similar to the Gallager rifle. They were delivered in August 1861.<sup>8</sup> The next 17,528 were .50 caliber carbines that used either brass or paper and foil cartridges that were also ignited with a percussion cap.<sup>39</sup> These were delivered from March 1862 to December 1864.<sup>8</sup> The last 5,000, delivered in May and June 1865 after the end of hostilities, fired the .52 caliber (.56-56) Spencer rimfire cartridge.<sup>39</sup> Serial numbers running into the 23000 range indicate that some Gallager carbines were also likely bought by individuals and state militias.<sup>42</sup> The Gallager carbine has been described as one of the most disliked breechloading carbines to see service during the war<sup>20</sup>, and greatly inferior to the Burnside, Sharps and Starr.<sup>42</sup> But 165 soldiers who carried them bought them at the end of the war when they mustered out.

The carbine saw extensive action. Where the first 200 were issued in 1861 isn't known, but most of the 1,438 issued by December 1862 went to the 5th Pennsylvania and 7th Ohio cavalry.<sup>46</sup> Eight additional cavalry regiments received enough to arm at least one company. In 1863 they were issued to the 7th Iowa, 9th Kansas, 21st Pennsylvania and 4th Tennessee, and in 1864 they were issued to the 2nd and 9th Tennessee, 2nd Arkansas, 6th Indiana, 16th Kansas and 4th Missouri. In total they were issued to at least sixty-two Union cavalry units and three mounted infantry units in both theaters of the war.<sup>2</sup> These units variously saw action at Williamsburg; on the Rappahannock; at Gettysburg; in West Virginia; at Chickamauga; near Pine Bluff; on the Sully Expedition against the Sioux; near the Smoky Hill Crossing in Kansas; Fort Cottonwood; near Fort Zarah; at the Sulphur Branch Railroad Trestle; on Sherman's Atlanta campaign and, shortly after the war, in a fight with the Sioux between Fort Laramie and Fort Kearney.<sup>20</sup>

Of the final contract for 5,000 Gallager carbines delivered in May and June 1865, half remained in storage at Frankford Arsenal. The other half went to St. Louis where they were issued to the 3rd Illinois, 11th Indiana, 12th Missouri and 12th Tennessee for service in the Indian Wars. All of these regiments were mustered out by May 1866, with 2,300 of the original 2,500 carbines reported as returned to stores.

A total of 13,557 Ordnance-procured Gallager carbines are known to have survived the Civil War. As of June 30, 1866 there were 12,719 in storage. None were still issued to the troops; 165 had been taken home by soldiers who had mustered out and 673 had been sold (Table 2). The survival rate of just 59.7% reflects early first delivery in August 1861, exposure to combat for about 80% of them and inferior quality. This survival rate excludes an unknown number of carbines lost to deserters, and Confederate captured and collected carbines. A few battlefield losses of Gallager carbines are documented. It was reported in one case that "the men would throw them away and take a musket or any other arm" to fight with.<sup>20</sup> Thirty-six men with Gallager carbines were captured at Williamsburg; nineteen were captured by the 9th Virginia on the Rappahannock and 159 were captured at the Sulphur Branch Railroad Trestle. Gallager carbines were of some value to Confederate forces; the 6th Texas, 9th Tennessee and 11th Virginia are all listed as having been armed with them.<sup>2</sup>

Post-war arsenal and Ordnance sales data account for 10,650 Gallager carbines sold from July 1866 through December 1901.<sup>2</sup> The largest annual sales were 1,349 in 1867; 1,139 in 1869; 2,500 in 1870 and 5,662 in 1901. The 1870 sale was to Schuyler, Hartley & Graham, who in turn sold the guns to France for use in the Franco-Prussian war<sup>10</sup>. The 1901 sale was to Francis Bannerman.<sup>46</sup>



### **Gibbs Carbines - Survival Rate = 49.4%**

The Gibbs carbine is a .52 caliber percussion breechloader that fired a combustible paper cartridge. It had the lowest total production of any of the twenty Civil War carbines except the Lindner. Just 1,052 were delivered before the factory that was making them burned down in the July 13, 1863 New York draft riots; 550 were delivered in May 1863 and the other 502 in June. Production was under way on an order for another 10,000 when the factory burned. Five hundred were ready for Ordnance inspection, and about 6,000 were in various stages of production, when they were destroyed in the fire.<sup>8</sup>

Gibbs carbines were issued to the 13th and 16th New York cavalries and the 10th Missouri Volunteer Cavalry. In July 1863, the 13th New York received 250 Gibbs carbines. They patrolled the rear of the Army of the Potomac during the Gettysburg Campaign; saw duty in defense of the Capitol; skirmished with Stuart's cavalry near Annandale and were on the campaign against Mosby's raiders. After four months of field service, they reported problems with the Gibbs and in 1864 they turned them in for Sharps carbines.<sup>20</sup> The 16th New York was issued Gibbs carbines in Washington in June 1863. They also patrolled the rear of the Union army during the Gettysburg Campaign, and defended the Capitol. Part of the unit was routed and captured near Lewisville, Virginia in October 1863. Like the 13th New York, they turned in their Gibbs for Sharps carbines in 1864.<sup>20</sup>

The 10th Missouri was issued Gibbs carbines in the summer of 1863, and reported 496 on hand in late 1863. The unit engaged with Nathan Bedford Forrest's troops at Brice's Crossroads in

June 1864. Over several days, in Forrest's greatest victory, the Union forces were totally routed. In addition to casualties, the 10th Missouri lost 49 Gibbs carbines. In July they engaged again with Forrest's troops and lost two more.<sup>2</sup> McAulay writes that "By June 1864, at the time of the Brice's Crossroads action, the opinion of the regiment was that the Gibbs were 'little better than none.'" They remained with the 10th until February 1865, however, when they were replaced with Spencer carbines. These were the last Gibbs carbines in field service.<sup>20</sup>

A total of 520 Ordnance-procured Gibbs carbines are known to have survived the Civil War (49.4%). As of June 30, 1866, there were 518 in storage; none had been taken home by soldiers mustering out, two had been sold on the market and none were still issued to the troops (Table 2). This survival rate seems fairly low given its limited exposure to combat, even factoring in the gun's poor quality and the proportionally high losses to Confederate forces. The Gibbs survival rate excludes an unknown number of carbines lost to deserters, as well as C.S.A. captured and collected carbines. Fifty-one Gibbs carbines were documented as lost to Confederate forces by the 10th Missouri alone. As a percussion breechloader it should have been of some value to Confederate forces, but no southern regiments are listed as having been armed with them by McAulay.<sup>20</sup>

Post-war arsenal and Ordnance sales data show 250 Gibbs carbines sold from July 1866 through December 1901. The St. Louis Arsenal sold fifty-eight in 1869, and the New York Agency sold 192 to Francis Bannerman in June 1901.<sup>2</sup> The fate of the other 268 that were in storage in June 1866 isn't known.



### Hall Carbines - Survival Rate = 26.3%

The Hall carbine was the first American percussion firearm, the first breechloader, and the first carbine adopted by the U.S. military for active service. They were made from 1834-1853, originally for the U.S. Dragoons, in five different smoothbore models of .52, .58 and .64 caliber.<sup>4</sup> Total production was about 27,185 (Table 1). They saw heavy use in the west, in Florida and during the Mexican War, but all had been replaced with Sharps carbines by 1858.<sup>6</sup> Pressed back into service in 1861 at the outbreak of hostilities, it was the oldest carbine to see action in the war.

In what became known as the Hall Carbine Affair, 5,000 Model 1843 Hall carbines in storage at the U.S. Arsenal in New York were sold to A.M. Eastman in August 1861 at \$3.50 each. These were rifled to .58 caliber, and re-sold the next month to General John C. Fremont in St. Louis at \$22.00. McAulay also documents a first delivery of 1,059 Hall carbines in August 1861, purchased for the Union Defense Committee of New York.<sup>8</sup> These numbers are consistent with General Ripley's annual Ordnance Report of June 10, 1862, that 6,059 had been purchased by the government - the number used here for total Ordnance procurement during the Civil War.

The Fremont carbines were quickly put into service with twelve different cavalry regiments. While greatly disliked by the Union cavalrymen to whom they were issued<sup>6</sup>, they saw widespread use throughout the Civil War. In addition to two U.S. regiments, they were issued to at least twenty-one state regiments including from Arkansas (1), Illinois (4), Indiana (1), Iowa (1), Kansas (3), Missouri (8), New York (2) and Wisconsin (1). These units saw action against guerillas in northern Missouri; at the Coldwater River in Arkansas; at Oakland, Mississippi; Spring River; Paris, Tennessee; against Quantrill's Raiders; at Fairview; at Vicksburg; in the Sioux Uprising of 1862; in the spring 1862 Shenandoah Valley Campaign against Stonewall Jackson and in the May 1862 Union retreat through Winchester. In the spring of 1865, they were still in the hands of the 15th Kansas, 6th Missouri and 1st Dakota Cavalry.<sup>20</sup>

A total of 1,595 Ordnance-procured Hall carbines are known to have survived the Civil War (26.3%). As of June 30, 1866 there were 1,227 in storage; none had been taken home by soldiers mustering out, 368 had been sold and none were still issued to the troops (Table 2). This is the lowest survival rate of the twenty carbines purchased by Ordnance. It reflects the gun's first delivery

in August 1861, and its hard use in both theaters of the war until after Appomattox. Poor quality was also a significant factor. Responding to an Ordnance survey of 1863-1864, every one of the twenty-one field officers commenting on the Hall carbine considered it "*poor to worthless*".<sup>6</sup> One after-action report following the Union retreat through Winchester in May 1862 stated that "*the men were armed with Hall's carbines (unserviceable), and but few were brought in*".<sup>20</sup> In an 1863 field report on the battle of Helena, Arkansas, more than half of the 1st Indiana

*"threw away their carbines, many of them being unserviceable having been condemned by the United States inspecting officer some time since, and supplied themselves with Enfield rifles captured from the enemy"*.<sup>2</sup>

Davis<sup>7</sup> calls the Hall "the least regarded" of the breechloaders, but he also notes that

*"most troops preferred them to the alternative muzzle-loading arms. In Fremont's western command in the early days of the war, it was the men with these Halls who were called to the front when the fighting was hottest."*

One officer of the 2nd Missouri Cavalry wrote that,

*'probably typical of the view held by most officers, the Hall carbine was a good arm compared to shotguns and squirrel rifles, but among the better breechloaders there was no comparison.'*<sup>2</sup>

The Hall survival rate excludes an unknown number of carbines lost to deserters, as well as Confederate captured and collected carbines. McAulay lists ten Confederate cavalry regiments armed with them, and notes that 192 Hall carbines were issued in the first two months of the war.<sup>2</sup> In addition, North Carolina issued 609 Hall carbines and fourteen were in storage at Fayetteville. The Hall carbine was listed in the 1862 Confederate field manual for the use of Officers on ordnance duty, and it stayed in Confederate service throughout the war.<sup>8</sup>

Post-war arsenal and Ordnance sales data account for 1,969 Hall carbines sold from July 1866 through December 1901. The largest sales were 348 in November 1867, and 1,376 sold to Marcus Hartley in June 1901.<sup>2</sup> As the number of sales greatly exceeds the 1,227 in storage in June 1866, the balance must have come to Ordnance from state militias and from Confederate stores that were captured at the end of the war.



### **Joslyn Carbines - Survival Rate = 49.8%**

A total of 11,261 Joslyn carbines were bought by Ordnance during the Civil War, in three different models. The .54 caliber Model 1855 fired a combustible paper or linen cartridge, and the .52 caliber Models 1862 and 1864 fired the .56-56 Spencer metallic cartridge. At least 5,800 Joslyn carbines were also sold commercially.<sup>8</sup>

McAulay details the delivery of 1,060 of the early Model 1855 “Monkey Tail” Joslyn percussion carbines from June 1861 to July 1862.<sup>8</sup> Ohio received 610 of these; 100 were issued to each of the 2nd, 3rd and 4th Ohio Cavalry and 250 were issued to the 6th Ohio.<sup>20</sup> Units with these carbines saw extensive action near Tullahoma; along the Tennessee River in Alabama; at Lexington against Morgan’s Raiders; near Mount Jackson; against Stonewall Jackson during his Shenandoah campaign; at Second Manassas and in Pope’s Northern Virginia campaign.<sup>20</sup> The other 10,201 Joslyn carbines were Model 1862 (2,201) and Model 1864 (8,000) carbines. The Model 1862 was first delivered in late 1863, and the Model 1864 in the fall of 1864. The last delivery was in February 1865.<sup>8</sup> Cavalry regiments that were issued these later models included the 4th and 8th Indiana; 1st New York Dragoons; 19th New York; 13th Tennessee; 9th Pennsylvania; 3rd West Virginia; 2nd Wisconsin; 1st Nebraska; 1st Nevada and 11th Ohio. These regiments also saw extensive action in the Civil War, including at Manassas Junction; on the Rapidan River; Barnett’s Ford; in Grant’s overland campaign towards Richmond; at Todd’s Tavern; Yellow Tavern; Cold Harbor; Trevilian Station; the killing of General John Hunt Morgan at Greeneville and in Sherman’s 1864 march through Georgia.

A total of 5,602 Ordnance-procured Joslyn carbines are known to have survived the Civil War (49.8%). As of June 30, 1866 there were 3,949 in storage and two had been sold (Table 2). Those who carried them in the war bought 177 of them when they mustered

out, 3.2% of all surviving specimens. Still issued to volunteer and independent cavalry battalions in the west were 1,474 carbines. These included the 2nd California Cavalry (120 guns), 11th Ohio Cavalry (33), 1st Nebraska Cavalry (471), 3rd U.S. Colored Cavalry (850) and 5th U.S. Colored Cavalry.<sup>2</sup> The low 49.8% Civil War survival rate of the Joslyn carbine reflects both its very early appearance in the war in June 1861, and its very heavy use throughout the war. Quality was also a factor. There were significant problems with the Model 1862 carbine, especially with extraction of spent cartridges. This affected its performance in the critical year of 1864, although the Model 1864 corrected most of these design problems.<sup>20</sup>

The collective Joslyn survival rate for all three models excludes an unknown number of carbines lost to deserters, as well as Confederate captured and collected carbines. The 9th Pennsylvania, in its report during Sherman’s march to the sea, reported ninety-five carbines lost in action and another thirteen that they abandoned; McAulay writes that these were probably Joslyn carbines.<sup>20</sup> The most dramatic loss was probably at Lexington, where about 500 cavalrymen were captured by Morgan’s Raiders along with all of their Joslyn carbines. The early percussion Monkey Tail carbines should have been of significant value to Confederate troops, but the utility of the later metallic cartridge carbines would have been limited by the availability of ammunition. In any case, McAulay lists no C.S.A. regiments armed with any of the three models.<sup>2</sup>

The Joslyn Fire Arms Company tried to sell surplus carbines on the commercial market after the Civil War, including an unsuccessful attempt to sell 2,000 to the Ordnance Department as late as April 1866. The company went out of business in 1866, and its assets were sold at a Sheriff’s sale in June 1868.<sup>8</sup> Post-war arsenal and Ordnance sales account for 5,992 Joslyn carbines sold from July 1866 through December 1901. The largest sales were 2,600 in December 1870 to Baldwin & Co., and 2,120 in June 1901 to Marcus Hartley.





### **Lindner Carbines - Survival Rate = 38.6%**

The Lindner percussion breechloading carbine ranked second to last in Civil War carbine procurement after the Wesson, with just 892 purchased by Ordnance. Recent research by Hull enumerates an actual total of 901.<sup>47</sup> For statistical consistency, the survival rate is calculated based on the slightly lower Ordnance number (Table 2). Two kinds of Lindner carbines were procured by Ordnance, under different contracts. Both fired combustible cartridges. Referred to by Hull as Austrian conversion carbines, the first 391 were actually Austrian muzzleloading rifles in .60 caliber that were converted by American Edward Lindner to breechloading carbines in the United States. All were delivered in November 1861.<sup>8</sup> Most were issued to the 1st Michigan Cavalry, and 100 remained in inventory as of December 1862. The second contract, for 500 1st Type American Lindner carbines in .58 caliber, was negotiated in November 1862. Made by Amoskeag Manufacturing Co., 501 were delivered in January 1863 and shipped in April to the new state government in West Virginia.<sup>47</sup> About 300 were issued to the 8th West Virginia Mounted Infantry in June 1863; in September 1863 the unit listed 297 as still in inventory.<sup>2</sup> The other circa 200 carbines were also probably used by the West Virginia military.<sup>47</sup> A contract for up to 6,000 Type 2 American Lindner carbines was signed in April 1863, but they weren't assembled in quantity until February 1865 and the final lot of 6,000 wasn't completed until May 1865. When these were rejected by Ordnance, legal action ensued. Amoskeag ultimately sold them at the end of the decade to France through Schuyler, Hartley & Graham for the Franco-Prussian war.<sup>47</sup>

Lindner carbines saw extensive use in the Civil War, but they were only issued to two units. The 1st Michigan used the Austrian conversion carbines in the 1862 Shenandoah Valley campaign and at Second Manassas.<sup>8,48</sup> By December 1862, those had been

replaced with 385 Sharps carbines.<sup>47</sup> The 8th West Virginia used 1st Type American carbines when it pursued Lee's army after Gettysburg. They also saw action at White Sulphur Springs in August 1863, and Droop Mountain in November 1863. Artifacts recovered from these sites confirm that Lindner carbines were used. Designated as the 7th West Virginia Cavalry in January 1864, the unit saw action at Lynchburg in June. They kept their Lindner carbines throughout 1864, trading them in for Spencer carbines in early 1865.<sup>2,20</sup>

The quality of the Lindner carbine wasn't evaluated by the 1864 Wilson assessment, and no field reports on the performance of the gun are mentioned in McAulay's works. A total of 344 Ordnance-procured Lindner carbines are known to have survived the war. As of June 30, 1866, there were 344 in storage; none were taken home, none had been sold prior to June 1866 and none were still issued to the troops (Table 2). This very low survival rate of 38.6% - the second lowest of the twenty brands of carbine procured during the Civil War after the Hall carbine - reflects both its very early entry into the war and its heavy use in action. The survival rate excludes both guns lost to deserters and Confederate captured and collected carbines. As a percussion breechloader, and the only carbine of the twenty procured by Ordnance during the Civil War that used a standard .58 caliber bullet<sup>7,49</sup>, the American Lindner carbine should have been of significant utility to Confederate forces. McAulay, however, lists no Confederate cavalry regiments that were armed with the gun.<sup>2</sup>

Of the 344 Ordnance-procured Lindner carbines known to have survived the Civil War, 338 of them - likely 1st Type American carbines - were offered for sale in 1873. None are known to have sold<sup>50</sup>. McAulay<sup>2</sup> reports that 325 were sold from the Allegheny Arsenal to Francis Bannerman almost thirty years later, in November 1901.



### Maynard Carbines - Survival Rate = 77.0%

Tested by the Army in the late 1850s, the Maynard was one of the best performing and most accurate carbines of the pre-Civil War era.<sup>8</sup> The model procured by Ordnance during the war used a percussion cap to ignite a .50 caliber brass cartridge with a broad rimmed base. Only the second carbine procured by Ordnance to use a metallic cartridge, a total of 20,002 were bought during the Civil War. The Massachusetts Arms Company made about 5,000 1st Model Maynard carbines from circa 1858-1859, in both .35 and .50 caliber.<sup>8</sup> Four hundred in .50 caliber were delivered to the Army from March-April 1859. Sixty were issued to the Regiment of Mounted Rifles at Fort Union Depot, New Mexico, and eighty-three were issued to the 1st Cavalry for use in the Indian campaigns. At the start of the Civil War, the 9th Pennsylvania and 1st Wisconsin were partially armed with the carbine. The Massachusetts Arms Co. factory burned down in January 1861, delaying further procurements. Some of the 400 already delivered saw action at Wilson's Creek in August 1861, and the 1st Wisconsin was using them at Chattanooga in October 1863.<sup>8,20</sup> In June 1863, Ordnance contracted for 20,002 Maynard 2nd Model carbines in .50 caliber. Unlike the 1st Model that used the Maynard tape primer, these used standard percussion caps. The first delivery wasn't until a year later in June 1864, with nineteen subsequent deliveries through May 1865.<sup>8</sup> The majority were put in storage, and those that were issued saw less than a year of action. This accounts for the many specimens found today in excellent condition. Maynard carbines were issued to the 9th and 11th Indiana Cavalry, and the 3rd, 4th, 10th and 12th Tennessee (U.S.) cavalry regiments. The carbine saw action against Hood at Nashville in December 1864, and at Vicksburg, New Orleans and Mobile. It was also issued to troops engaged in the Indian Wars. These actions, begun early in 1865, continued for several years after the Civil War<sup>20</sup>. By 1870 they had all been withdrawn from service.<sup>51</sup>

A total of 15,392 Ordnance-procured Maynard carbines are known to have survived the Civil War. As of June 30, 1866 there

were 14,400 in storage. None had been sold on the market, 871 had been paid for and taken home by soldiers mustering out of service and 121 were still issued to the troops (Table 2). This relatively robust survival rate of 77.0% reflects the carbine's late entry into the war in June 1864, its limited combat exposure and the high proportion of carbines that were stored instead of issued. The Maynard survival rate excludes an unknown number of carbines lost to deserters, as well as Confederate captured and collected carbines. The carbine was heavily employed by the South, as the Confederate *Field Manual for the Use of Officers on Ordnance Duty* listed it in both .35 and .50 caliber as an official arm of the Confederate States.<sup>8</sup> While no Maynard-type carbines were manufactured in the South, cartridges for the smaller .35 caliber arms were produced in Southern arsenals.<sup>41</sup> Also, as Layman points out in his treatise on the Maynard<sup>52</sup>, "*One of the bonuses of the percussion Maynard was that if all the loaded ammunition had been expended, the arm could be fired with a single case as a muzzleloader.*"

Many 1st model Maynard carbines in government arsenals were confiscated by the C.S.A. at the outbreak of the war, and some 90% of the 3,201 1st Model carbines in storage as of October 1, 1860 were sold to southern militias. These included 625 to Mississippi; 1,030 to Florida; 650 to Georgia; about 800 to militias in South Carolina and Louisiana and small quantities to most other southern states early in the war.<sup>8,3</sup> At least fifteen Southern cavalry regiments were armed with Maynard carbines in Georgia, Florida, Louisiana, Mississippi, Tennessee and Virginia, plus seven infantry regiments.<sup>2</sup>

While the Maynard carbines in storage after the war were in excellent condition<sup>8</sup>, sales on the open market were extremely slow. Post-war arsenal and Ordnance sales account for 13,556 sold from July 1866 through December 1901. Over 85% of these - 12,378 - were sold to Francis Bannerman and others in 1901.<sup>2</sup>



### **Merrill Carbines - Survival Rate = 46.5%**

The Merrill carbine was a .54 caliber percussion breechloader that fired a nitre-treated paper or linen cartridge.<sup>40</sup> It ranked ninth in Ordnance procurement during the Civil War (Table 2). Various sources list total procurement at 14,255<sup>43</sup>, 14,495<sup>3</sup> and 14,695<sup>40</sup>, but McAulay<sup>8</sup> details thirty-two discrete deliveries totaling 15,255 - the number used here. The first delivery was in November 1861 and the last was in July 1864.

Merrill carbines saw extensive use by Union cavalry regiments throughout the Civil War. They were issued to the 27th Kentucky; 1st, 4th, 5th and 18th New York; 1st New Jersey; 7th Indiana; 1st and 3rd Wisconsin; 11th, 17th and 18th Pennsylvania; 1st Delaware and 6th Kansas. They were also issued to some infantry units, including the 1st and 2nd Tennessee (U.S.) Mounted Infantry.<sup>8,20</sup> These units variously saw action in the Shenandoah Valley; Second Manassas; Bristoe Station; Stone River; against Quantrell's raiders; at Gettysburg; Boonsborough; in northern Arkansas; at Brice's Crossroad; Gallatin; Suffolk; Jarratt's Station; Flat Creek Bridge and City Point, Virginia. McAulay documents the very significant attrition of Merrill carbines in the hands of Union cavalry units in some of these engagements.<sup>20</sup>

Reports on the quality of the Merrill carbine varied widely. Units variously rated it acceptable overall in the summer of 1862; as a superior arm in the fall of 1863 and as the favorite arm of the regiment in 1864. In March 1864 the 7th Indiana reported problems with fouling and broken stocks, and the 2nd U.S. Colored Cavalry reported similar problems. But the 2nd, which found that the carbine carried well and didn't get out of order easily, rated it as an excellent arm. Quality problems seem to have increasingly manifested the longer the Merrill was in field service. Manufac-

turing defects were blamed for very high carbine attrition in two Pennsylvania units in 1864, and in the fall of 1864 the 1st Delaware reported them to be "very defective." Hundreds had become unserviceable by September 1864, and by 1865 the men of the 11th Missouri had "*found problems with their Merrills and were glad to exchange them for Sharps*".<sup>20</sup> Nonetheless, twenty-five Merrill carbines were bought by the men who carried them in the war when they mustered out.

A total of 7,100 Ordnance-procured Merrill carbines are known to have survived the Civil War. As of June 30, 1866, 7,016 of these were in storage. None were still issued to the troops, twenty-five had been paid for and taken home by soldiers mustering out of service and fifty-nine had been sold (Table 1). This low Civil War survival rate of 46.5% reflects the carbine's early arrival in November 1861, the very extensive action it saw through the end of the war and the inconsistent quality of the gun. This survival rate excludes an unknown number of Merrill carbines lost to deserters, and Confederate captured and collected carbines. McAulay documents one case of desertion with arms, and battlefield losses of Merrill carbines at Bristoe Station in August 1862.<sup>20</sup> Using a combustible envelope cartridge and percussion cap, the Merrill was widely used by Confederate forces. This included by eighteen C.S.A. cavalry regiments from Georgia, North Carolina, Texas, Tennessee and Virginia. A small number of Merrill carbines were procured before the war, but most of those in the service of the South were captured and collected.<sup>2</sup>

Post-war arsenal and Ordnance sales data show 6,161 Merrill carbines sold from July 1866 through December 1901. The largest sales were 1,165 in October 1871; 1,571 in October 1876; 1,935 in June 1901 to Marcus Hartley and 1,414 in June 1901 to Francis Bannerman.<sup>2</sup>



### **Palmer Carbines - Survival Rate = 99.9%**

The Palmer carbine was a .50 caliber bolt action firearm that used the .56-50 Spencer rimfire metallic cartridge. It was the first bolt action metallic cartridge arm that was accepted for U.S. issuance.<sup>10</sup> Ordnance records list 1,000 Palmer carbines purchased, all of them except one delivered in June 1865 after the end of the war.<sup>8</sup> The June 1864 contract called for delivery by January 1865, but as with the Ball carbine it was delayed until June 1865 because of a change in specified caliber from .44 rimfire to .56-50 Spencer.<sup>44</sup> Both carbines were made by the same company, E.G. Lamson, in Windsor, Vermont.

The 99.9% survival rate of the Ordnance-procured Palmer carbine includes 999 guns in storage as of June 30, 1866. None were

taken home, none had been sold and none were in the hands of U.S. troops (Table 2). The near-perfect survival rate of the gun is the result of its never having been issued, which also accounts for the excellent condition of most of these guns today.<sup>3</sup>

The Palmer carbines were kept in storage until October 1870, when they were offered for sale to the highest bidder by the Chief of Ordnance<sup>44</sup>. When none sold, they went back into storage until September 1901. At that time, the entire lot of 999 was sold out of the Kenaba Arsenal - along with fifty pounds of spare parts that had also been in storage for 35 years - to Marcus Hartley & Co. for about thirty cents each.<sup>2</sup>



### Remington Carbines - Survival Rate = 95.0%\*

Remington carbines procured by Ordnance during the Civil War were the pre-rolling block, split-breech design that fired metallic rimfire cartridges. Early Type I small frame carbines were chambered in .44 using a No. 46 long rimfire cartridge; the later Type II large frame carbines were in .50 caliber and fired the .56-50 Spencer cartridge (Table 3).

Ordnance procured a total of 19,999 Remington carbines during the Civil War. The first contract was in December 1864 for 5,000 Type I carbines. McAulay lists deliveries starting in March 1865 and ending in June 1865.<sup>8</sup> None of these are known to have been issued to federal troops. Fourteen hundred, however, were apparently issued to state militias. Two hundred went to New Hampshire, where the militia used them after the war<sup>2</sup>; these were listed as still on hand as of June 1, 1868.<sup>53</sup> The other twelve hundred went to Vermont in 1865 in response to the St. Albans raid of October 1864. According to Spears,

*“14 companies of militia cavalry were raised quickly and for the remainder of the War patrolled the border. Remington carbines were supplied, along with Smith carbines, but only the Smith carbines were received in time to be issued to the Frontier cavalry companies”.*<sup>16</sup>

Vermont listed 1,196 Remington carbines still on hand as of October 1866<sup>2</sup>, making a total of 1,396 of the 1,400 state militia guns that are known to have survived the war in addition to the 3,600 Type I carbines that were never issued. The rest of the Remington carbines procured, 14,999 Type II guns, missed the war entirely. The first were delivered in September 1865 and the last in May 1866.

Table 2 shows a total of 17,605 Ordnance-procured Remington carbines known to have survived the war. This includes 17,604 reported as stored as of June 1866.<sup>2</sup> None were taken home by soldiers, none were still in service and only one was sold prior to June 1866. This generates a survival rate of 88.0%. But if the 1,396 surviving carbines from New Hampshire and Vermont are added, the number of survivors climbs to 19,001 and the survival rate to 95.0%. Since these were very likely Ordnance-procured guns, this is the survival rate used here. The fate of the other 998 carbines isn't clear. A note from McAulay states that *“in 1871, it is known that the .46 (sic) caliber Remington carbines were being used by the 9th U.S. Cavalry.”*<sup>8</sup> How many were issued to that unit is unclear, but it could help account for the missing number.

Ordnance sold the vast majority of the 14,999 Type II carbines, a total of 14,757<sup>10</sup>, back to Remington in November 1870. They were then re-sold to France for the Franco-Prussian War.<sup>6</sup> The surviving Type I guns were also put up for sale in late 1870, but unsuccessfully.<sup>2</sup> In 1876 there were 3,663 Type I and 382 Type II Remington carbines sold to H. Boker & Company, strongly suggesting that some of the Vermont and/or New Hampshire carbines had been returned to Ordnance at some point after the war.



### Sharps Carbines - Survival Rate = 46.5%

The Sharps carbine was a .52 caliber percussion breechloader that fired a paper or linen combustible cartridge using either a disc primer or percussion cap. The leading single-shot breechloader of the Civil War<sup>10</sup>, it was first placed in U.S. military service in 1853 when 150 Model 1851 carbines were issued to the 1st and 2nd Dragoons.<sup>54,41</sup> Subsequent models were procured in much greater quantities. At the outbreak of the Civil War, Model 1853 Sharps carbines were in the hands of the 1st and 2nd Dragoons, and New Model 1859 carbines were in the hands of the 2nd Dragoons and 1st and 2nd Cavalries.<sup>2</sup> The 1st California Cavalry was also armed with Model 1853 Sharps carbines at the start of the war.<sup>23</sup>

Of nine major brands of breechloading carbine already tested by the Army; the Hall, Jenks, Colt, Sharps, Burnside, Perry, Greene, Maynard and Merrill - the Sharps received the most favorable reports.<sup>7</sup> During the war, Sharps carbines ranked second in procurement after Spencer with 77,330 purchased (Table 2). A different Ordnance rackup gives total procurement at 80,512.<sup>25</sup> While earlier models were still in service, carbines procured during the war consisted of three nearly identical models: the New Model 1859, New Model 1863 and New Model 1865. The first delivery was in September 1861, and they continued almost weekly until March 1865. Because they were all delivered by the end of the war, far more Sharps carbines saw action than Spencer carbines - half of which weren't delivered until after Appomattox.<sup>8</sup>

According to McAulay, "it was almost universally agreed upon that the Sharps was the best single-shot percussion carbine in use by the cavalry."<sup>20</sup> They were in very high demand, and the vast majority were issued to the field. The New Model 1859 was issued to at least twenty-one Union regiments, and about 176 regiments were armed with the New Model 1863 over the course of the war.<sup>8</sup> By 1865 they were still in the hands of regiments from Arkansas, California, Illinois, Indiana, Iowa, Kentucky, Kansas, Louisiana, Maryland, Massachusetts, Minnesota, Mississippi, Missouri, Michigan, New Hampshire, New Jersey, New York, Ohio, Nevada, Pennsylvania, Rhode Island, Tennessee, Texas, Vermont, West Virginia, Wisconsin as well as in the hands of U.S. regiments.<sup>2</sup> From 1861-1863, these units variously saw action at Bird's Point; Annandale; Vienna; Pittsburgh Landing; Shiloh; Stone's River; Williamsburg; Falmouth; Barbee's Crossroad; Port Hudson; Richmond, Louisiana; Aldie, Virginia; Upperville; during Grierson's Raid; at Brandy Station; Gettysburg; Brinkerhoff's Ridge; Fairfield and Chickamauga. From 1864-1865 they saw action in the Kilpatrick/Dahlgren raid; at Leesburg; Wallace Ferry; in the Red River campaign; at Cold Harbor; in Sherman's Atlanta campaign; at Stony Creek Depot; Jonesborough; in the Union counter to Confederate General Price's Missouri invasion; at Fairfax Court House; in Sherman's Carolina campaign; in Grant's campaign

against Lee at Petersburg; at Five Forks; Paine Crossroads; Appomattox and in the capture of John Wilkes Booth.<sup>20</sup>

A total of 33,554 Ordnance-procured Sharps carbines are known to have survived the Civil War. As of June 30, 1866, there were 27,878 in storage; 3,127 were still issued to the troops, none had been sold on the market, and 2,549 had been paid for and taken home by soldiers mustering out (Table 2); McAulay erroneously lists 3,454 taken home, which were Sharps rifles.<sup>20</sup> This low survival rate of 46.5% reflects their very early entry in the war, and their extremely heavy use throughout the conflict. The Sharps survival rate excludes an unknown number of carbines lost to deserters, as well as those captured and collected by Confederate forces that may have survived the war.

The Sharps was a valuable firearm for the South, and it was both used and copied by Confederate forces - an estimated 5,200 were made by or for the C.S.A.<sup>8</sup> Sharps carbines armed the C.S.A. Regulars, and cavalry regiments from Georgia (8), Louisiana (1), Mississippi (6), North Carolina (6), South Carolina (1), Tennessee (2), Texas (5) and Virginia (12) and some Confederate infantry regiments.<sup>2</sup> Anecdotal reports of Sharps carbines lost or captured by Confederates were reported at Vienna (15); Pittsburgh Landing (2); Brice's Crossroad (54); Brandy Station (165) and during Price's invasion of Missouri (107).<sup>2</sup> The capture worked both ways, as Sharps carbines and thousands of rounds of ammunition were re-recovered by Union forces upon the surrender of Confederate troops.<sup>20</sup>

Most of the serviceable Sharps percussion carbines that were either issued or in storage at the end of the war were sent to Sharps and, from 1867-1869, converted to fire the .50-70 metallic cartridge. A total of 31,098 converted carbines were delivered to Springfield Armory by 1869.<sup>8</sup> About a third of those were then re-issued to active duty troops, where they served extensively during the Indian Wars and the opening of the American west. At the end of the 4th quarter 1874, there were still 7,795 Sharps carbines in the hands of troops.<sup>51</sup> Less than a year later, in September 1875, that number had dropped to just 304<sup>2</sup> as they were replaced by the new Springfield trapdoor carbines in .45-70. They continued to be issued in small numbers until at least 1882, when 250 were issued to the Regulars. As late as 1898 the state of New Mexico still armed one of its cavalry troops with Sharps carbines.<sup>20</sup> Of note, archeological evidence shows that .50-70 caliber Sharps carbines were among those in the hands of the Indians who defeated Custer at Little Big Horn.

Post-war arsenal and Ordnance sales show 17,667 Sharps carbines sold from July 1866 through December 1901. The largest sales were 9,116 in November 1888<sup>19</sup>; 3,872 in June 1901 and 4,008 in December 1901.<sup>2</sup>



### Sharps & Hankins Carbines - Survival Rate = 54.5%

The Sharps & Hankins carbine was a .52 caliber rimfire breech-loader that fired the .56-56 Sharps & Hankins rimfire cartridge.<sup>55</sup> It was made by C. Sharps & Co. in Philadelphia from 1862-1865, a different company than the Sharps Rifle Manufacturing Company which made Sharps carbines. About 12,000 total were made of three basic types: a Navy type, an Army type and a short-barreled carbine. Spears<sup>55</sup> distinguishes five different models of these. Ordnance records document only procurement of Army carbines.<sup>12</sup>

This is the only model for which period procurement data are not listed in OD 1866a<sup>56</sup>, and it is one of just two models - the Hall carbine is the other - where there are significant data differences between the two primary procurement lists. The procurement number used here is that of McAulay<sup>8</sup>, based on ExDoc 99<sup>12</sup>, who documents delivery of 1,468 Sharps & Hankins carbines from September 1862 to January 1865. All but eighteen of these were delivered in either September 1862 or November 1863. The first delivery was for 250 guns and the later delivery was for 1,200. One additional carbine was bought from Schuyler, Hartley & Graham in May 1863, and seventeen experimental guns in .30 and .44 caliber were delivered in January 1865.<sup>8</sup> In addition to these federal purchases, fifty-seven carbines were purchased by the state of Pennsylvania soon after Lee's invasion of the state in 1863, and delivered in September 1863.

The short barrel carbine described by Spears<sup>55</sup> is a 19-inch barrel carbine with a saddle ring, referred to by Flayderman<sup>3</sup> as the Short Cavalry Type. While these were apparently manufactured by Sharps & Hankins on spec for sale to the Army, Spears<sup>55</sup> writes that the only confirmed record of their purchase was by the Navy.

*“Sharps & Hankins offered 500 of these and the Navy purchased them on 27 July 1863... There is no confirmed record of Army purchases of this model... On 4 February 1864, Sharps & Hankins offered to sell 2,000 carbines to the Army. There is no actual record of an Army purchase but the number of these short barrel carbines that survive today indicates*

*many more than the 500 purchased by the Navy and the fifty-seven purchased by Pennsylvania were made. Probably more than 2,000 of this model were manufactured and most of the carbines offered by Sharps & Hankins on 4 February 1864 to the Army were likely this model.”*

The great majority of Sharps & Hankins Army carbines were in the field by August 1864. They saw heavy use, and were described as “very acceptable with only minor problems to the ejector mechanism.” The carbines were issued to the 3rd, 4th, 9th, 10th and 11th New York Volunteer Cavalry regiments.<sup>8,20</sup> These units variously saw action near Kinston, North Carolina; at Gettysburg; Stafford; on Grant's 1864 Richmond campaign; at Yellow Tavern; Trevilian Station; St. Mary's Church and on railroad duty near Memphis.

Eight hundred Ordnance-procured Sharps & Hankins carbines are known to have survived the Civil War. As of June 30, 1866, all of them were in storage. None were taken home by soldiers mustering out, none had been sold and none were still issued to the troops (Table 2). This fairly low survival rate of 54.5% reflects their early first delivery in September 1862, their final delivery in November 1863 and the heavy action that they saw throughout the war. The survival rate excludes an unknown number of carbines lost to deserters, as well as those captured and collected by Confederate forces that may have survived the war. Because the carbine fired an internally primed metallic cartridge, its value to Confederate forces was limited by the availability of suitable ammunition. McAulay lists no C.S.A. regiments armed with Sharps & Hankins carbines.<sup>2</sup>

Post-war arsenal and Ordnance sales data show only eight carbines sold from July 1866 through December 1901.<sup>2</sup> The fate of the other 792 is unknown.



### Smith Carbines - Survival Rate = 61.0%.

The Smith carbine was chambered in .50 caliber and used a percussion cap to fire a rubber, or paper and foil-covered brass cartridge. It ranked third in Civil War procurement with a total of 31,002 purchased by Ordnance (Table 2). These were delivered in thirty-six shipments, with the first delivery of 400 in January 1862 and the last in June 1865.<sup>8</sup> Another circa 2,800 Smith carbines were sold either directly to militias, on the commercial market or to Argentina. During the Civil War, 500 were purchased by the State of New York and 300 by the 5th Missouri Volunteer Cavalry.<sup>16</sup>

Spears documents Ordnance procurement of two major models.<sup>16</sup> The first 11,000 were Model 1861 carbines with sling swivels, and the other 20,000 were Model 1863 carbines that instead used a sling bar and ring. The carbine's proprietary .50 caliber India rubber cartridge acted fairly well as a breech seal. A shorter foil and paper cartridge was developed for the Smith late in the war, and sold to Ordnance in bulk.

In addition to the first four U.S. Army cavalry regiments, Model 1861 carbines were issued to seventeen volunteer cavalry units by the end of 1862.<sup>16</sup> By the end of the Civil War, at least sixty-five cavalry units and four mounted infantry units had been issued Smith carbines.<sup>2</sup> These included units from Alabama (1), Arkansas (1), Connecticut (1), Illinois (3), Indiana (4), Kansas (6), Kentucky (11), Maine (1), Maryland (2), Massachusetts (1), Minnesota (4), Missouri (3), New Jersey (1), New York (7), Ohio (4), Pennsylvania (2), Tennessee (2), West Virginia (5) and Wisconsin (1).

Smith carbines were issued almost as quickly as they were delivered<sup>16</sup>, and they saw extensive combat during the Civil War. Significant engagements occurred during Grant's Central Mississippi Campaign; at Water Valley; at Second Bull Run; near Centerville; at Fredericksburg; Antietam; Snicker Gap; against guerillas in Tennessee; at Vicksburg; in the Chickamauga Campaign; at Gettysburg; Madisonville; in the Richmond Campaign; in the Dakota Sioux Campaign and in Sherman's Atlanta campaign, among others.<sup>20</sup>

The reported quality of the Smith carbine ranged across the spectrum from excellent to totally worthless.<sup>20</sup> The Smith ranked fourth in the percentage of surviving guns paid for and taken home by troops mustering out, at 3.7%. The only carbines ranked higher were the Spencer, Sharps and Maynard (see Part II). The 19th New

York Cavalry called the Smith an excellent arm, praising it for its accuracy and range, plus its ease of loading on horseback. Conversely, the 1st Massachusetts did not. That unit suffered significant casualties at Snicker Gap in 1862, where their Smith carbines repeatedly and continuously misfired. The problem, however, was determined to be cartridge damage prior to loading. Similar misfire problems with Smith carbines occurred with the 3rd Maryland Cavalry in Louisiana in January 1864:

*'The carbines misfired a great deal of the time. One of the sergeants stated that two of every three shots missed fire. The capture of the detachment's commanding officer brought panic to the ranks. The men fled for safety, and in their retreat suffered nine casualties as well as the loss of five Smith carbines....The report of the skirmish states that the men would not stand and fight with the carbine then issued to them. They believed that they would only be throwing away their lives for no purpose with the use of these carbines'<sup>20</sup>.*

Of the Smith carbines procured by Ordnance, a total of 18,911 are known to have survived the Civil War. As of June 30, 1866 there were 17,478 in storage. None were still issued to the troops, 695 had been taken home by troops mustering out of service and 738 had been sold (Table 2). This 61.0% survival rate is a fairly robust for a carbine that was first delivered in January 1862 and saw very heavy use throughout the war. The survival rate excludes an unknown number lost to deserters, and Confederate captured and collected carbines. While it used a proprietary rubber cartridge, it also relied on standard percussion ignition. They were therefore of substantial utility to Confederate forces as a battlefield pickup. McAulay lists thirteen C.S.A. cavalry regiments that were armed with recovered Smith carbines, from Louisiana, North Carolina, South Carolina, Texas, Virginia and the C.S.A. Regulars.<sup>2</sup> The south had experience with Smith carbines even before the outbreak of hostilities; at least 350 carbines made in 1860 were sold to Alabama and South Carolina just before the Civil War.<sup>16</sup>

Post-war arsenal and Ordnance sales data show 18,673 Smith carbines sold from July 1866 through December 1901.<sup>2</sup> The great majority, 15,949 guns (85.4%), were sold off after 35 years in storage to Marcus Hartley, the Nolan Brothers and others in June 1901.





### Spencer Carbines - Survival Rate = 67.6%

The Spencer carbine was a seven-shot repeater that loaded through the stock. It was the most advanced carbine used in the Civil War, and was widely considered the best.<sup>40,20,21</sup> McAulay writes that “except that it used a rimfire cartridge, it would hardly be equaled in performance until the very end of the nineteenth century”<sup>20</sup>. It ranked first in the number taken home at the end of the war - 12.9% of all surviving Spencer carbines - paid for by troops mustering out.

More Spencer carbines were bought by Ordnance than any other carbine. McAulay details Ordnance deliveries of 95,181<sup>8</sup>; marginally different figures are reported by Lewis<sup>56</sup>, Marcot<sup>18</sup> and Flayderman<sup>3</sup>. Most (64,685 or 68.0%), were Model 1860 carbines firing a .52 caliber rimfire cartridge (.56-56) made by the Spencer Arms Co. The other 30,496 (32.0%) were .50 caliber Model 1865 carbines made by the Burnside Rifle Company that fired the Spencer .56-50 rimfire cartridge. These were procured by Ordnance in 1865, and delivered after Appomattox. The first delivery of Ordnance-procured Spencer carbines was October 1863, with deliveries continuing almost weekly until the final delivery in January 1866. About half of those were delivered during the war; the other half (47,986 or 50.4%) were delivered after Appomattox.<sup>8</sup> In spite of their relatively late first delivery, the Spencer carbine saw extensive action in the Civil War.<sup>20</sup> Marcot writes that

*“Initially, they had been issued to mounted infantry or cavalry units in small lots of 40 or 50 at a time, with commanders presenting them to deserving soldiers...As the war progressed, more and more Spencer’s were made, and issue to Federal cavalry troops became commonplace.”*<sup>18</sup>

Spencer carbines were issued to at least ninety-five cavalry units and four U.S. regiments<sup>2</sup>. These units came from Connecticut (1), Delaware (1), Florida (1), Illinois (6), Indiana (5), Iowa (5), Kansas (3), Kentucky (6), Maine (2), Massachusetts (3), Michigan (10), Missouri (3), New Jersey (3), New York (12), Ohio (11), Pennsylvania (11), Rhode Island (1), Tennessee (2), Vermont (1), West Virginia (6) and Wisconsin (2). Three mounted infantry units were also equipped with them, and many additional carbines were bought by individual soldiers. In 1864 these units saw action on the Kilpatrick-Dahlgren raid; on Grant’s Rapidan campaign; at Parker’s Store; Haw’s Shop; Trevilian Station; the Bermuda Hundred; the siege of Petersburg; Ripley; Oxford; Nashville; Winchester; Saylor’s Creek; near Campbellsville; the Boydton Plank Road and near Memphis. In 1865 they saw action on Wilson’s Selma raid; on the Mobile campaign; in Richmond after Lee evacuated; at the bridge over the Appomattox River; Sherman’s march

from Savannah to Goldsboro; Bentonville; Dinwiddie Court House; attacks on Lee after his Petersburg retreat; Saylor’s Creek; Selma; Irvinville, Georgia; the capture of Jefferson Davis and in a number of engagements in the west against the Sioux, Cheyenne, Arapaho, Shoshoni and other tribes.<sup>20</sup>

A total of 64,342 Spencer carbines procured by Ordnance are known to have survived the war. As of June 30, 1866, there were 55,005 in storage and 8,289 had been taken home by soldiers mustering out of service - far more than any other brand of carbine. None had been sold on the market, and 1,048 were still issued to various units (Table 2). This survival rate of 67.6% reflects a first entry in October 1863, and very heavy combat use. Only half of all the Spencer carbines procured, however - 47,185 or 49.6% - were delivered in time to see service. If the survival rate were calculated for only those carbines that were delivered prior to Appomattox, the survival rate would be 34.8%—the second lowest of all twenty carbines after the Hall. These survival rates exclude an unknown number of guns that were either lost to deserters, or Confederate captured and collected carbines. McAulay anecdotally reports losses of fifty-nine on the Kilpatrick-Dahlgren raid, and thirty-two near Memphis.<sup>20</sup> He lists fifteen C.S.A. Cavalry regiments that were armed with captured Spencer carbines from North Carolina, Texas and Virginia, as well as the C.S.A. Regulars.<sup>2</sup> The use of Spencer carbines by the South was limited by the availability of Spencer ammunition. As popular as they were, the men in the 8th Texas Cavalry quit collecting them on the battlefield altogether because of the difficulty of procuring ammunition.<sup>22</sup> The C.S.A. made a concerted effort to manufacture Spencer ammunition towards the end of the war, but the surrender at Richmond came before cartridges there could be manufactured.

As with the Sharps carbine, Ordnance decided after the Civil War to convert Spencer carbines in storage and reissue them to fight the Indian Wars in the west. A total of 15,518 were modified at the Springfield Armory from July 1866 to June 1874 to convert them from .52 caliber to .50 (.56-50) caliber. In addition, 12,502 were fitted with a Stabler cutoff device so they could be used as a single loader with cartridges still in the magazine.<sup>18</sup>

Spencer carbines were replaced by Springfield trapdoor carbines in the early 1870s. They were withdrawn from service starting in 1870, and by the 4th quarter of 1874 only 745 were still in the hands of troops.<sup>51</sup> Post-war arsenal and Ordnance sales data from July 1866 to December 1901 show 42,998 sold; the largest sales were 34,438 guns in 1870 that went to the Franco-Prussian War; 4,035 in 1876 and 2,778 in 1901.<sup>2</sup>



### **Starr Carbines - Survival Rate = 60.9%**

The Starr carbine was tested by Ordnance in 1858, but it wasn't added to the U.S. arsenal until the Civil War. It was procured in two models. The first was a .54 caliber percussion breechloader that fired a linen cartridge; the second was in .52 caliber and fired the Spencer .56-56 metallic rimfire cartridge. The Starr carbine ranked fifth in Ordnance procurement with 25,602 purchased - 20,601 first model, and 5,001 second model. The first delivery was in July 1863, followed by about two deliveries per month through August 1864. These were all first model carbines, and they saw extensive service during the war. The second model metallic cartridge carbines were delivered from March to May 1865, and saw very little or no action.<sup>8</sup>

Starr carbines were described as another of the least-liked carbines of the Civil War.<sup>20</sup> A February 1864 assessment of all arms in Union service found that

*“Problems included rapid fouling, failure of the hammers to discharge the percussion caps (later the same claim would be made about detonation of Starr rimfire cartridges), and that locks and mainsprings were defective.”<sup>21</sup>*

This assessment, described in Part II, concluded that the percussion Starr “was the worst carbine in use” of the fifteen carbines assessed. Nonetheless, 266 were paid for and taken home by soldiers mustering out—1.7% of the Starr carbines that survived the war.

Starr carbines saw extensive use in the hands of forty-four cavalry regiments from Arkansas (2), Colorado (3), Illinois (1), Iowa (1), Kansas (4), Kentucky (1), Michigan (3), Missouri (9), New Jersey (2), Nevada (1), Ohio (3), Pennsylvania (8), Tennessee (1), Vermont (1), West Virginia (2) and the U.S. Regulars (2). They were also issued to the 30th Kentucky Mounted Infantry.<sup>2</sup> These units variously saw action at Snickerville; Cold Harbor; the seizure of Petersburg; the infamous slaughter of Cheyenne at Sand Creek; skirmishes with guerillas in Missouri; action with Indians near Fort Zarah; at Searcy; Fayetteville; Blackwater Swamp; Murfree’s Station; on Sherman’s Selma Campaign; on Grant’s 1865 Virginia campaign; at Five Forks and at Memphis.<sup>20</sup> All of these units were

armed with first model percussion carbines. The Starr cartridge carbines didn’t arrive until March 1865, when the first 1,000 were sent directly from the factory to the Winchester Ordnance Depot. About two-thirds were issued to the 12th Pennsylvania, which was on duty in the Winchester area that spring. That delivery was just prior to Appomattox. The 14th Pennsylvania mustered out about this same time, turning in 163 Starr carbines; these may also have included some second model guns.<sup>2</sup>

Of the 25,602 Starr carbines procured by Ordnance, a total of 15,589 are known to have survived the Civil War. As of June 30, 1866 there were 14,385 in storage; 266 had been taken home by soldiers mustering out, 521 had been sold and 417 were still issued to the troops (Table 2). This 60.9% survival rate reflects the carbines’ first delivery in July 1863, its broad issuance to troops in both theaters of the war, its fairly extensive use in combat and its generally poor quality. The Starr survival rate excludes an unknown number of carbines lost to deserters, as well as Confederate captured and collected carbines. McAulay documents nineteen lost during skirmishing at Snickerville in March 1864, and a number of others that ended up in Confederate hands during action around Petersburg in October 1863.<sup>20</sup> Because the percussion model Starr could be fired with loose ball and powder<sup>57</sup>, it should have been of significant utility to Confederate forces. No Confederate cavalry regiments, however, are listed by McAulay as carrying Starr carbines.<sup>2</sup>

After the war, many of the rimfire Starr carbines were shipped west where they were issued to the 2nd U.S. Cavalry<sup>2</sup>. By the end of 1867, all of them had been withdrawn from service and replaced with Spencer and converted Sharps carbines.<sup>51</sup> With no further government procurements lined up, the Starr Arms Company was dissolved in 1867.<sup>41</sup>

Post-war arsenal and Ordnance sales data account for 17,637 Starr carbines sold from July 1866 through December 1901. From 1865 to 1869, there were 12,803 sold to eleven different commercial buyers - nearly half of all the carbines of all twenty brands sold during this period. The biggest post-Civil War sale after that was 4,364 carbines in June 1901 to Marcus Hartley & Co.<sup>2</sup>



### Warner Carbines - Survival Rate = 71.5%\*

Ordnance bought 4,001 Warner carbines during the Civil War. This was the only brass-framed carbine purchased. Aside from a single Ordnance inspection gun submitted in January 1864, they were acquired under two contracts. The first was for 1,501 carbines chambered for the .515 caliber Warner rimfire cartridge. Many of these were later rechambered for the .52 caliber (.56-56) Spencer cartridge at the Washington Arsenal. The first delivery was in March 1864, with three more deliveries through November 1864.<sup>8</sup> The first contract carbines saw limited use during the relatively short period in which they were issued to the troops. The first cavalry regiment to receive them was the 1st Wisconsin<sup>20</sup>, which saw action at Hopkinsville, Kentucky; in the Wilson raid that ended at Macon, Georgia; and in the attack on Fort Tyler. This unit reported 200 on hand in September 1864, and 341 on hand in February 1865. They exchanged them for Spencer carbines in March 1865.<sup>2</sup>

In January 1865, 500 first contract Warner carbines were issued to the 3rd Massachusetts Volunteer Cavalry Regiment for field trials.<sup>58,20</sup> After negative performance reports, they were sent to the Washington Arsenal for further examination and replaced with five hundred Sharps carbines for the spring campaign in the Shenandoah Valley.<sup>2</sup> A significant number of Warner carbines were also sent to Colorado Territory and issued to the 1st Colorado Volunteer Mounted Militia early in 1865 to protect against Indian attacks. Although the number issued there isn't recorded, the original call for that unit was 365 volunteers; 324,000 rounds of Warner ammunition was shipped to St. Louis in June 1865.

The 2,500 second contract Warner carbines were chambered for the .52 caliber (.56-56) Spencer cartridge.<sup>8</sup> These were delivered from February to March 1865. None, however, were issued; they all went into storage and were sold as "new" in 1870.<sup>2</sup>

Of the 4,001 Warner carbines procured by Ordnance, a total of 2,860 are reported to have survived the Civil War (71.5%). As of June 30, 1866 there were 2,824 in storage, thirty-six had been sold to soldiers mustering out and none had been sold on the market (Table 2). McAulay writes that some remained in federal service

into 1867, but none were listed as still issued to the troops as of June 30, 1866.<sup>8</sup> This Civil War survival rate of 71.5% seems low. Of the 2,824 in storage at the end of the war, 2,500 were second contract guns that were never issued. That leaves just 324 in storage out of the 1,501 first contract carbines, 321 of them in the St. Louis Arsenal.<sup>20</sup> What happened to the other 1,177 carbines? The first delivery was March 1864, the carbine was only distributed to three units, and it saw only limited action. Attrition in the field can't account for this. Higher than expected attrition could be accounted for, at least in part, by poor quality but reports on this were mixed. The 1st Wisconsin Cavalry liked the gun, finding that it was accurate and worked well.<sup>20</sup> All thirty-six that were paid for and taken home by soldiers mustering out - 1.3% of the Warner carbines that survived the war - were bought by men from that unit. The springs and small of the stock were weak, however, and it had notorious difficulty loading and extracting the Warner rimfire cartridges.

The 1864 Wilson assessment of carbine quality, described in Part II, classified the Warner carbine as among the worst carbines of the fifteen carbines assessed.<sup>21</sup> In March 1865, 493 of the 500 carbines issued to the 3rd Massachusetts were condemned altogether.<sup>58</sup> These guns were apparently not accounted for as either issued or still in storage in the June 1866 returns. Another possible source of error is underreporting of the number of other Warner carbines either in storage or still issued to troops in Wisconsin and/or Colorado. The Civil war survival rate excludes an unknown number of Warner carbines lost to deserters, and Confederate captured and collected carbines. Since the Warner carbine fired metallic rimfire cartridges, battlefield recoveries would have been of only limited value to Confederate forces without access to ammunition. McAulay lists no C.S.A. regiments that were armed with Warner carbines.<sup>2</sup>

Post-war Ordnance and arsenal sales account for 2,710 Warner carbines sold from July 1866 through December 1901. The largest sale was 2,500 - Lustyik gives the number as 2,492 - "new" carbines to Schuyler, Hartley & Graham in October 1870, destined for the Franco-Prussian war.<sup>10</sup>



### Wesson Carbines - Survival Rate = 84.1%\*

The Wesson carbine was made in several calibers, but the military version was in .42 caliber and used the same cartridge as that used in the Ballard carbine: the No. 44 cartridge designed by Daniel Wesson.<sup>10</sup> It's notable for having the lowest total procurement of any of the twenty carbines bought during the Civil War. Thousands were made, serial numbers go up to at least 3983<sup>42</sup>, but just 151 were acquired by Ordnance. All but one of those were bought from Ben Kittredge & Company in Cincinnati, and they were delivered to the State of Ohio in July 1863.<sup>8</sup> These guns were bought under federal authority, but were never sent for U.S. Ordnance inspection. Flayderman's observation that no Wesson carbines are known to carry federal inspection marks<sup>3</sup> suggests one reason why the fate of these 151 carbines is so unclear. Some or all of the Ohio guns may have been issued to its 11th Volunteer Infantry.<sup>40</sup> That unit bought 220 Wesson carbines independently, probably also from Kittredge<sup>20</sup>; if so, both Ordnance- and militia-procured guns may have been commingled.

Most of the other Wesson carbines that saw action were also bought by state militias.<sup>41</sup> The extent to which some of these were paid for under federal authority isn't known, but none aside from the 151 are accounted for on official Ordnance procurement lists. A letter from Ramsey accounts for 1,150 in service as of 1 August 1864<sup>39</sup>, but far more than that were in the hands of militias. Indiana militia units had 760; Kentucky units, including the 7th, 8th and 9th, had 1,366 and many more went to Kansas and to the 4th, 6th and 8th Missouri militias.<sup>39,8,2</sup>

Wesson carbines saw a great deal of action during the Civil War with state militia units. The 11th Ohio Infantry, for example, which may have received the Ordnance-procured carbines, fought heroically at Chickamauga in September 1863. Three of its soldiers earned the Medal of Honor for taking and holding Missionary Ridge. The 11th was also part of Sherman's campaign against Atlanta in 1864.<sup>20</sup>

Of the Wesson carbines procured by Ordnance, a total of fifty-one are reported as surviving the Civil War (33.8%). All were in storage as of June 30, 1866; none had been sold on the market and none were listed as still issued to the troops (Table 2). While McAulay<sup>20</sup> states that four were taken home, none are listed as having been sold to soldiers who were mustering out.<sup>15</sup> This very low calculated survival rate of 33.8%, the second lowest behind the Hall carbine, is a significant anomaly - especially with a first delivery of July 1863. Intense combat exposure at Chickamauga could conceivably account for a rate that low - with over 16,000 Union casualties out of a force of 60,000.<sup>59</sup> But it probably results from incomplete accounting of the few carbines procured by Ordnance. McAulay<sup>2</sup> reports that 127 were accounted for by the Army as of March 1, 1865, for example, which generates a far more likely survival rate of 84.1%. Post-war Ordnance and arsenal sales data, moreover, show that 107 Wesson carbines were sold out of federal stores after the Civil War - eighty-two in late 1866, and twenty-five in April 1869.<sup>2</sup>

It's far from clear whether those shown in storage and those listed as sold were actually part of the 151 carbines procured by Ordnance for the State of Ohio. That's because of confusion in accounting for Wesson carbines that were moving back and forth between Ordnance stores and state stores at the end of the Civil War. In June 1865, for example, the Louisville Ordnance Depot sought guidance on what to do with "several hundred Ballard and Wesson carbines that had been turned in by Kentucky troops." After receiving approval, those carbines were returned to the state.<sup>2</sup> For these reasons, McAuley's reported survival rate of 84.1% is adopted here as the most accurate. Unaccounted for in the survival data are losses to deserters, and Confederate captured and collected carbines. Lack of suitable metallic cartridge ammunition would have limited the usefulness of captured guns, however, and McAulay lists no C.S.A. regiments that were armed with them.<sup>2</sup> That said, at least one photo is known of a Confederate soldier holding a Wesson carbine.<sup>8</sup>

## EPILOGUE - CIVIL WAR CARBINE SURVIVAL TODAY

The survival statistics in this analysis only reflect losses through June 30, 1866. Half of the carbines that survived the Civil War sat in federal storage for thirty-five years until they were sold off in 1901 to Francis Bannerman and others - primarily for arming foreign militaries, and for the newly evolving collectors market. This accounts for the excellent survival and availability of many of these guns today. That said, the survival rates of Civil War carbines, especially in their original configuration, is no doubt lower today than at the end of the Civil War. Sources of attrition and modification are peculiar to each individual brand, but the three biggest sources have likely been conversion, foreign sales and hard U.S. military and civilian use in the American west.

*Conversion to Metallic Cartridge.* The percussion ignition system was effectively dead by the end of the Civil War. The Army began immediately converting over 31,000 Sharps carbines from percussion to metallic cartridge, and issued them to troops who were fighting the Indian Wars in the west. Along with Spencer carbines converted from .52 metallic cartridge to .50 caliber, these were a stopgap until Springfield developed the trapdoor carbine and issued it widely to U.S. troops starting around 1873. As with the evolution from flintlock to percussion ignition earlier in the 19th century, many other percussion carbines were converted *ad hoc* - by brokers who bought the guns surplus for resale and by retailers, gunsmiths and end users, both domestic and foreign.

*Offshore Sales.* Sales to foreign militaries, directly or indirectly, occurred throughout the post-Civil War period. The biggest took place just before the Franco-Prussian War. Sales in 1870 alone totaled almost 57,000 carbines<sup>2</sup>, and one ship, the steamer *Ontario* out of Boston, shipped 20,950 carbines to France in a single shipment that year. The history of these guns is complex, however. Some 5,000 percussion Sharps carbines that were shipped to France were bought back by Boker & Co. around 1875<sup>60,61</sup>, converted to fire a metallic cartridge and re-sold on the American market.

*Hard Use in the American West.* Many of the carbines that were sold out of inventory in the years after the Civil War were used hard in the American west. These especially include the most popular Civil War carbines, the Sharps and Spencer. Marcot writes regarding the latter that

*“the importance of Spencer repeaters to the frontier cavalry was immense: they became the primary U.S. cavalry shoulder arm, and remained so, until they were replaced by the “trapdoor” Springfields of the 1870s. (These) carbines were issued first to regular cavalry troopers, later to Indian guides and scouts, and eventually to individual frontier settlers for personal protection in many Western Territories...”*<sup>18</sup>

These and other Civil War carbines were used by ranchers, farmers, homesteaders, miners, market hunters, mail route operators, the builders of roads, railroads and telegraph lines and the many others who opened the American west.

By 1900, the Civil War carbine was almost entirely gone from the American landscape. Among civilians it had been replaced by lever action repeating carbines like the Winchester and Marlin, and in the military by magazine repeating carbines like the Krag-Jorgensen. As the dawn of the 20th century marked the end of the horse soldier, so too it marked the end of the carbine that he carried into battle in the Civil War.

**Special Note:** All carbines from the Jeff Goodson Collection

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