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Provisioning the Requirement: Machine Gun Needs of the British Expeditionary Forces in France, 1914–1916

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Abstract

At the outbreak of the First World War, the British Army was in the process of replacing its Maxim machine guns with the Vickers machine gun it had adopted in 1912. Although both weapons were of the same calibre and shared some common accessories, they were not wholly compatible. Furthermore, with the expansion of the British Expeditionary Force and the concomitant need to increase its automatic firepower, the introduction of more machine guns had to be managed with increased demand and complexity, with additional new models introduced as the war progressed. By analysing the war diaries of the lines of communication, this article evaluates the rollout of the Vickers and later models, and the implications they had on the logistics, personnel, and organisation across the Force. It is hoped this approach will offer an insight into the prioritisation and decision-making of this critical period, as well as an opportunity to understand the growing importance of the machine gun ahead of the formation of the Machine Gun Corps in October 1915.

Keywords: Great Britain, Maxim, Lewis, Vickers, machine guns, First World War, Machine Gun Corps

Introduction

In 1914, the British Army entered the First World War with infantry battalions and cavalry regiments as its main fighting elements. Each was armed with two machine guns (MGs), forming an MG section attached to the headquarters and under the command of an MG officer. The total MG strength of a British Expeditionary Force (BEF) division (either infantry or cavalry) was therefore 24 guns,[1] and there were no other automatic weapons. The only other small arms in these divisions were the Lee-Enfield rifle and the Webley revolver. Machine guns had been part of the British Army since the 1870s, and their evolution had resulted in a number of different models of guns being adopted—each with distinct technical characteristics, summarised in *Table 1*. Of those used in the First World War, the Maxim and Vickers were both water-cooled, belt-fed, and tripod mounted, the Lewis and Madsen (which ultimately was never taken into service) were air-cooled and magazine-fed, whereas the Hotchkiss and Colt were air-cooled but fed by a feedstrip (Hotchkiss) and a belt (Colt). As this article will discuss, the manner in which they were eventually used is somewhat determined by these principal characteristics.

Table 1 – Key characteristics of the Maxim, Vickers, Lewis, Hotchkiss, Colt & Madsen MGs

	Maxim	**Vickers**	**Lewis**	**Hotchkiss**	**Colt**	**Madsen**[2]
Cooling	Water	Water	Air	Air	Air	Air
Feed	Belt	Belt	Magazine	Strip	Belt	Magazine

[1] War Office (WO), *Field Service Pocket Book* (London: His Majesty's Stationery Office, 1914), pp. 2–10, available via: <https://vickersmg.blog/manual/field-service-pocket-books/>; *War Establishments 1 - 50* (London: His Majesty's Stationery Office., 1914), sec. 'War Establishment of the 3rd Cavalry Division', October 1914; sec. 'War Establishments of the 7th and 8th Divisions', available via: National Archives WO 24/900.

[2] Despite favourable trials, the Madsen was manufactured in Denmark. Although a neutral country, the practicalities of export resulted in it not being adopted for service. See: Ministry of Munitions, *History of the Ministry of Munitions, Volume XI: The Supply of Munitions* (London: His Majesty's Stationery Office, 1922), Part V, pp. 16–18.

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Mounting	Tripod	Tripod	Tripod (later bipod)	Tripod (small)	Tripod	Bipod

Source: Paul Cornish, *MGs and The Great War* (Barnsley: Pen & Sword Books Limited, 2009); War Office, *Textbook of Small* Arms (London: His Majesty's Stationery Office, 1929)..

The MGs in service at the beginning of the First World War were the Maxim and the Vickers. A newer model of the Maxim, chambered for the .303 British (7.7 × 56R mm) cartridge, was introduced on 19 June 1899;[3] however, earlier versions (chambered for the .577/450 Martini–Henry, approximately 12 × 59R mm, cartridge) remained in service alongside the newer machine guns. Although the Vickers was formally introduced into the Army on 26 November 1912,[4] many units retained the Maxim.[5] The Vickers' introduction is often summarised as occurring "[d]uring the early part of 1915" when "the infantry battalion's two Maxim MGs were replaced by four Vickers"[6] and it is even referred to as the BEF's "standard" MG.[7] The production numbers for MGs in the Great War are found in the *History of the Ministry of Munitions*[8] and the *War Memoirs* of David Lloyd George.[9] These include all automatic weapons developed during the War, but unfortunately do not indicate how they were distributed to the units at the front. Lloyd George describes the increase in MG demand from 1915 to 1916,[10] and discusses the need for trained men to operate the increased number of guns that had been procured; however, the figures given do not distinguish between MG models, despite their differing characteristics. It was not possible to merely increase the number of Vickers in service with any rapidity due to the complexity of their production and the single factory (Erith[11]) used for their manufacture. It was not until 1916 that a second factory (Crayford[12]) was brought into use for manufacturing the Vickers. The complexity of the gun's production was compounded by the lack of skilled machine setters and ongoing labour troubles.[13] Along with increased production facilities, the gun was simplified through the course of the War, and this sped up output. *Table 2* provides the annual production figures.

Table 2 – Production Output from Vickers Erith & Crayford Works

1914	1915	1916	1917	1918
38 up to 4 August 339 after 4 August	2,433	7,468	21,751	41,699

Source: Dolf Goldsmith, Richard Fisher, E. Dan Shea & Robert G. Segel, *The Vickers Machine Gun: Pride of the Emma Gees* (Henderson: Chipotle Publishing, 2021), p. 60.

[3] WO, *Lists of Changes* (London: His Majesty's Stationery Office, 1899), para. 7,153.
[4] Vickers MG Collection & Research Association, '.303-Inch Mark I', *The Vickers MG* (2023), <https://vickersmg.blog/the-guns/303-inch-mk-i/>.
[5] Andrew Rawson, *British Army Handbook 1914–1918* (Stroud: Sutton Publishing, 2006), pp. 119–120, 266; Charles Messenger, *Call-To-Arms: The British Army 1914–18* (London: Cassell, 2005), pp. 28–29.
[6] Messenger, 2005, p. 174.
[7] Bruce Gudmundsson, *The British Expeditionary Force 1914–15* (Oxford: Osprey Publishing, 2005), p. 74.
[8] Ministry of Munitions, 1922, Part V, pp. 1–18.
[9] David Lloyd George, *War Memoirs – II*, (London: Ivor Nicholson & Watson, 1933), pp. 599–610.
[10] Committee of Imperial Defence, - *The Question of Training Men for the Employment of the Machine Guns*, available via: The National Archives, CAB 24/1/40.
[11] The guns were produced at the Vickers Limited factory in West Street, Erith, in southeast London.
[12] The site at Crayford, also in southeast London, was a little over two miles south of Erith.
[13] Ministry of Munitions, 1922, Part V, pp. 10–11.

Another MG, the Lewis 'automatic rifle', was introduced from December 1914.[14] The reasons for its introduction have been largely overlooked,[15] or simplified as reflecting the apparent requirement for a lighter MG for use in trench warfare.[16] For example, firearms historian Paul Cornish identifies in the BEF a desire to increase the number of available automatic weapons which "made any serviceable MG welcome".[17] A simplistic view of the Hotchkiss has likewise been put forward, which suggests that it was used only because it was "easier to make than the Vickers gun"[18] or that it was simply a stopgap weapon whilst the BEF awaited the arrival of the Lewis.[19] Even the War Office's (WO) own *Textbook of Small Arms*[20] broadly simplifies the issue of MGs, reflecting this commonly accepted wisdom. What's more, the Colt MGs of the Canadian Divisions—which were used until their replacement by the Vickers—are frequently overlooked entirely.[21]

In this article, the author describes the development of each model of MG and its introduction into service. This discussion is then linked to the changes in organisation in the BEF and the introduction of the brigade MG company, before the author presents a revised narrative regarding the expansion in the number and variety of MG models in service at the start of the First World War, correcting the simplistic views described above. It will also demonstrate the links between the infrastructure, logistics, and the development of doctrine through the discussion on the differences between MG models. In exploring these themes, this author uses a structured literature review of the war diaries of the Inspector General of the Lines of Communication (IGC) between August 1914 and November 1916.[22] This period represents the function's entire sub-series at The National Archives (TNA) and covers many aspects of administration, logistics and infrastructure as the BEF was expanding and consolidating its area of operations. The level of detail varies but they contain reports, summary returns and letters that provide information seldom found elsewhere. The IGC war diaries cover the period up to and beyond the Machine Gun Corps' (MGC) formation in October 1915, helping to understand how different units received MGs both before and after the supposed centralisation of the organisation.

These records include correspondence relating to the trials, introduction, distribution, and challenges of expanding MGs across the BEF. The confusing narrative of written letters and memoranda that were being sent to the IGC were eventually standardised as numerical returns from February 1915,[23] helping with ongoing planning.[24] In August 1915, statements were issued identifying the MGs required to complete a four-gun establishment[25]—the BEF's first major MG organisation change. Records of repairs and unserviceable guns recorded the attrition rates and number of MGs in reserve.[26] By fully reviewing these returns and the narrative surrounding them for all MG-related content, this author explains the logistical and informational challenges facing the

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[14] War diaries of the Inspector General of the Lines of Communication (IGC), available via: The National Archives (TNA), WO 95/3952/2 - IGC 1915 Jan (Part 2), pp. 38–44.
[15] G.S. Hutchison, *Machine Guns: Their History and Tactical Employment* (London: Macmillan and Co., Limited, 1938), pp. 142–43.
[16] John Walter, *Machine-Guns of Two World Wars* (London: Greenhill Books, 2005), p. 36.
[17] Paul Cornish, *MGs and The Great War* (Barnsley: Pen & Sword Books Limited, 2009), p. 78.
[18] Walter, 2005, p. 40).
[19] Rawson, 2006, p. 266.
[20] War Office, *Textbook of Small Arms* (London: His Majesty's Stationery Office, 1929), p. 154.
[21] C.S. Grafton, *The Canadian 'Emma Gees'* (London, Ontario: The Canadian MG Corps Association, 1938), pp. 37–38.
[22] War diaries of the IGC, available via: TNA, WO 95/3949 - IGC 1914 Aug to Oct.; TNA, WO 95/3971 - IGC 1916 Oct to Nov, 1916.
[23] War diaries of the IGC, available via: TNA, WO 95/3953/5_2 - IGC 1915 Feb (Part 5/2), pp. 37–38; TNA, WO 95/3953/6_2 - IGC 1915 Feb (Part 6/2), pp. 53–54.
[24] War diaries of the IGC, available via: TNA, WO 95/3954/3 - IGC 1915 Mar (Part 3), p. 128.
[25] War diaries of the IGC, available via: TNA, WO 95/3959/1-2 - IGC 1915 Aug (Part 1/2), p. 38.
[26] War diaries of the IGC, available via: TNA, WO 95/3951/8 - IGC 1914 Dec (Part 8), p. 118.

BEF, as well as their effects on doctrine, organisation, and personnel—all of which form part of MG capability.[27]

The Maxim & Vickers

MGs were first mentioned in the IGC records on 30 August 1914, at which time 45 guns and 27 tripods were requested by the BEF.[28] The potential confusion created by logistical issues is exemplified by the fact that the tripods were sent separately from the guns and could not be easily located. An investigation found that items such as Maxims (see Figure 1) were not prioritised over other stores irrespective of the urgency expressed by the recipient.[29] These guns were replacements for losses in the field, such as 21 MGs lost after the retreat of one division—which represented 87.5 per cent of the division's MGs.[30]

Ordnance Department stocks were reported in October 1914,[31] and showed that reserves were lacking. One depot reported only two spare locks and 43 barrels for Maxims, and no Vickers guns or spares at all. There were 200 belt boxes available and 32 Mark IV tripods, plus seven Mark II tripods (which at this point had become obsolete); but, after only a week, a total of just five tripods remained.[32] Another depot reported 100 Maxim and 50 Vickers barrels but no tripods.[33] Whilst these numbers are small, they represent a large percentage of the total MG parts available and demonstrate the disparate nature of logistics organisation. The report for the total issues in October 1914 indicates the turnover at the time: 645 belt boxes, 32 Maxim guns, 36 barrels, ten locks, 34 Maxim tripods, 14 Vickers tripods, 23 Vickers guns, and nine Vickers barrels, plus 72 limbered wagon fore and 88 hind portions.[34] The original BEF[35] had 144 MGs, each with 14 belt boxes[36] (2,016 in total). October replacements show an attrition rate of 38 per cent for guns and 32 per cent for belt boxes. A November study showed that the divisional rate of replacement (see *Table 3*) continued to be around one-third.[37]

Table 3 – Replacement of Machine Guns by Division, November 1914

	Issued between	
	24 October–12 November	**12–15 November**
1st Cavalry Division	4	..
2nd Cavalry Division	6	3
3rd Cavalry Division	2	1
1st Division	17	1
2nd Division	4	..
3rd Division	6	1
4th Division	11	..
5th Division	6	7
6th Division	5	2
7th Division	3	18

[27] Richard Fisher, 'Historical Defence Capability Analysis: Applying the Defence Lines of Development Retrospectively', *The RUSI Journal*, Vol. 168, № 1–2, pp. 98–106.
[28] War diaries of the IGC, available via: TNA, WO 95/3949/1 - IGC 1914 Aug to Oct (Part 1), pp. 48–49.
[29] *Op*. *cit*., pp. 150; 152–4.
[30] War diaries of the IGC, available via: TNA, WO 95/3949/4 - IGC 1914 Aug to Oct (Part 4), p. 98.
[31] War diaries of the IGC, available via: TNA, WO 95/3949/5 - IGC 1914 Aug to Oct (Part 5).
[32] *Op*. *cit*., p. 83.
[33] *Op*. *cit*., p. 94.
[34] War diaries of the IGC, available via: TNA, WO 95/3950/5 - IGC 1914 Nov (Part 5), pp. 75–76.
[35] Major A.F. Becke, *Order of Battle of Divisions* (Uckfield: Naval & Military Press, 2007), pt. 1.
[36] P.H.R. Jephson (ed.), *Instructional Binder, Instructional Staff* (Grantham: MG Training Centre, 1917), sec. 'Limber Drill'.
[37] War diaries of the IGC, available via: TNA, WO 95/3950/6 - IGC 1914 Nov (Part 6), p. 10.

Meerut Division	4	3
Lahore Division	4	2
Total MGs replaced	72	38

Source: War diaries of the IGC, available via: TNA, WO 95/3950/6 - Insp Gen of Communications 1914 Nov (Part 6), p. 10.

To immediately replace guns lost or rendered unserviceable due to action, IGC requested a reserve of 100 guns be maintained in France; however, this created an additional strain on supplies.[38] With the replacements from England, a question was raised as to whether "IGC would like some of the latter to be Vickers Light Guns, and if so how many". The response was that they "would like them to be all Vickers Light Guns".[39] As this article will show, this highlights the lack of knowledge of the chain of command as to the MGs in use and their requirements, because of the need to consider the wider equipment, logistical, organisational, and doctrinal capabilities at the time. It was planned for about 50 Maxims and 14 Vickers to be held as reserve stores, and for the Vickers to replace Maxims in service. To ensure compatibility with existing equipment, the recipient needed to state the gun they required so it could be issued as a complete set.[40] In one instance, the 7th Division lost 18 guns (75 per cent of their total) in November 1914, along with all associated equipment. As an example, only three replacements belt-filling machines of the nine required were available, meaning that belts had to be filled by hand, dramatically impacting the ability to provide sustained fire[41]—a difference of four minutes when filled by machine versus 12 minutes by hand.[42]

All outstanding demands were met by 3 December with a surplus of 48 guns,[43] which was reduced to 21 by 10 December and was quickly exhausted as another 20 were issued for a special operation.[44] The Meerut Division was heavily engaged over Winter 1914 and incorrectly requested three guns, anticipating future losses.[45] On top of these continued requests, IGC still had to build a reserve and now had to increase the number of guns from two to four in each section. This doubling of MG numbers was first proposed in November 1914, and was originally to be accompanied by an MG battery of six guns attached to brigades.[46] The consequential increases would exhaust the supplies then available—only 25 guns on 17 December,[47] of which ten were required for the MG School (MGS)[48], which were then being established to centralise and co-ordinate MG training across the BEF.[49]

Attrition rates remained high, and only 56 guns had been returned for repair against the 215 that were recently issued. As such, IGC wrote that "the prospect of working up to [four] per Battalion is

[38] War diaries of the IGC, available via: TNA, WO 95/3950/2 - IGC 1914 Nov (Part 2), p. 63.
[39] War diaries of the IGC, available via: TNA, WO 95/3950/1 - IGC 1914 Nov (Part 1), p. 75.
[40] War diaries of the IGC, available via: TNA, WO 95/3950/7 - IGC 1914 Nov (Part 7), p. 10.
[41] War diaries of the IGC, available via: TNA, WO 95/3950/2 - IGC 1914 Nov (Part 2), pp. 6–7.
[42] Richard Fisher & Richard Willis, 'One Million Rounds Fired in 12 Hours? An Analysis of the Account of Six Guns of the 100th Brigade MG Company at High Wood in August 1916', *First World War Studies*, Vol. 9 № 3 (2018), pp. 313–27.
[43] War diaries of the IGC, available via: TNA, WO 95/3951/1 - IGC 1914 Dec (Part 1), p. 10.
[44] War diaries of the IGC, available via: TNA, WO 95/3951/9 - IGC 1914 Dec (Part 9), p. 22.
[45] War diaries of the IGC, available via: TNA, WO 95/3951/11 - IGC 1914 Dec (Part 11), p. 103.
[46] War diaries of the IGC, available via: TNA, WO 95/3951/7 - IGC 1914 Dec (Part 7), p. 67.
[47] War diaries of the IGC, available via: TNA, WO 95/3951/2 - IGC 1914 Dec (Part 2), p. 26.
[48] The Machine Gun School was a training facility established in France in 1914 to provide instruction for replacement machine gunners, officers and to learn and share new information on how to use MGs to existing units already in France and Flanders without having to return them to the UK, for more information on the formation of the school see: C.D. Baker-Carr, *From Chauffeur to Brigadier* (London: Hazell, Watson & Viny Ltd, 1930)
[49] *Op. cit.*, p. 33.

remote."[50] Specific battalions with particular deficiencies were identified, and prioritisation began on a unit-by-unit basis.[51]

Figure 1 *A Maxim MG in service with the Machine Gun Corps in July 1916 (source: Graham Sacker Collection, Vickers MG Collection & Research Association, object № SKR00002.1.2).*

The first Motor MG Battery arrived in December 1914.[52] Its purpose was to provide mobile and quick support across larger formations and, to this end, the unit's MGs were mounted on motor-cycle combinations so they could be moved rapidly. As these guns were not part of the infantry or cavalry allocations, IGC asked whether there would be any additional parts and ammunition made available to the Brigade or Divisional ammunition columns as for the increase was not planned and became a burden on the local units.[53] This issue was eventually resolved, but created further pressure on the expanding system. Supplying guns for front-line units conflicted with training requirements, as there was insufficient supply to satisfy both units at the front and the MGS. The MGS requested 16 MGs on 3 December as they were not yet able to deliver courses on the Vickers—despite the fact that it was widely in service.[54] Only ten were available, and those were to be provided for the expansion of the MG sections.[55] Requests for a Colt gun (used by the Canadians) was made in July 1915.[56] It was, however, quickly recognised that Lewis gun training would be essential, and the first 16 Lewis guns to arrive in France were therefore destined for the MGS.[57]

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[50] *Op*. *cit*., p. 44.
[51] War diaries of the IGC, available via: TNA, WO 95/3951/7 - IGC 1914 Dec (Part 7), p. 69; War diaries of the IGC, available via: TNA, WO 95/3951/10 - IGC 1914 Dec (Part 10), p. 21.
[52] These Batteries were part of the Motor Machine Gun Service, which was a branch of the Royal Field Artillery. As a result, they used the word 'battery'—an artillery term—for their organisation. They became the Motors branch of the Machine Gun Corps in October 1915, when the latter was formed (War Office, *Army Order 414* (London: His Majesty's Stationery Office, 1915), available at TNA , WO 123/57).
[53] War diaries of the IGC, available via: TNA, WO 95/3952/1 - IGC 1915 Jan (Part 1), p. 47.
[54] War diaries of the IGC, available via: TNA, WO 95/3951/1 - IGC 1914 Dec (Part 1), p. 19.
[55] War diaries of the IGC, available via: TNA, WO 95/3951/8 - IGC 1914 Dec (Part 8), p. 83.
[56] War diaries of the IGC, available via: TNA, WO 95/3958/4 - IGC 1915 Jul (Part 4), p. 109.
[57] War diaries of the IGC, available via: TNA, WO 95/3958/5 - IGC 1915 Jul (Part 5), p. 7.

By the end of 1914, standardisation and simplification were necessary. The Quartermaster General (QMG) set out their requirements:

a) *No new guns will be Maxims, and it is desirable that each unit should have only one type of gun.*
b) *That it is necessary that detachments should be sent out who are trained in the use of the [Vickers] gun.*
c) *That the scheme of rearmament aims at:*
    a. *Arming 27th & 28th Divisions with 4 Vickers guns per battalion.*
    b. *Doubling armament of 1st Division and British Cavalry already armed with Vickers.*
    c. *Remaining 2nd Division, and all units whose drafts are found from same units as 1st, 2nd, 27th, & 28th Divisions, with Vickers guns.*
    d. *Doubling the armament of remaining units.*
d) *That with Maxim guns if contractors keep up to promise, the additional should be completed by the middle of February. But if it should be found necessary to indent on England meanwhile, the completion of the scheme will be delayed.*
e) *That endeavour will be made to send out trained detachments with each pair of Infantry guns, but [in case] of units who are being completely rearmed, it may be necessary to depend on men of existing sections.*
f) *The question of Batteries of MGs must stand over until the present scheme nears completion.*[58]

It was argued that trained machine gunners could quickly learn the technical differences between the Maxim and Vickers;[59] however, exchanging the different models of gun for one another caused equipment compatibility concerns. In addition, it was made clear by command that these exchanges must not be allowed to affect increasing section MGs from two to four.[60] As a result of high attrition rates, on 20 January 1915 IGC wrote to request a reserve of 20 guns to be held in France, in order to avoid waiting times for replacements from England. MGs received from England were sent to the front only when complete with transport and personnel, delaying their issue unless QMG demanded they be sent as quickly as possible.[61] Transport was unrealistically expected to be despatched at the same rate as the guns. As a result, ensuring that the models and numbers of MGs already in units was the same as the replacement MGs sent to those units became complex.[62] A list of units and their number and models of MGs was produced,[63] but this list was quickly disputed and the information it contained was often inaccurate.[64] For example, the statements inconsistently included motor MG batteries, which accounted for 81 of the total 930 MGs in France as of 3 April.[65] Despite the aspiration for divisional standardisation, the list identified significant differences between divisions, and all British divisions still needed MGs to bring their sections to four guns each; only the Canadian Division (armed with Colts) was complete. The Territorial Force (TF) divisions all had only two Maxims per section and the total deficiency five months after the expansion proposal was 276 guns.

IGC wrote to QMG on 30 January 1915 asking what to do if a specific MG was requested but not in stock: that is, should an alternative be sent? The response was to wait until the correct type was available, unless two or more replacements were requested at the same time. This could warrant a

[58] War diaries of the IGC, available via: TNA, WO 95/3952/1 - IGC 1915 Jan (Part 1), p. 11.
[59] War diaries of the IGC, available via: TNA, WO 95/3952/1 - IGC 1915 Jan (Part 1), p. 13.
[60] War diaries of the IGC, available via: TNA, WO 95/3952/2 - IGC 1915 Jan (Part 2), p. 143.
[61] War diaries of the IGC, available via: TNA, WO 95/3952/1 - IGC 1915 Jan (Part 1), p. 100.
[62] *Op. cit*., p. 106.
[63] War diaries of the IGC, available via: TNA, WO 95/3952/6 - IGC 1915 Jan (Part 6), pp. 16–18.
[64] War diaries of the IGC, available via: TNA, WO 95/3953/3 - IGC 1915 Feb (Part 3), p. 10.
[65] War diaries of the IGC, available via: TNA, WO 95/3955/4 - IGC 1915 Apr (Part 4), p. 75; War diaries of the IGC, available via: TNA, WO 95/3955/5 - IGC 1915 Apr (Part 5), p. 38.

total change and was referred to General Headquarters (GHQ),[66] although Maxims were not issued instead of Vickers as they were considered obsolescent.[67] This caused incompatibility in units armed with Vickers, and slowed down the planned increase to four guns for those divisions armed with Maxims.[68] In March, there was tension between the IGC and QMG with information on divisional MG inventory not matching the available stock or programme previously sent.[69] The IGC wrote:

> "*As regards* [MGs]. *We issue according to a programme arranged by you. We do not know what is required to complete every regiment in the country; at the present moment we have still 8 Vickers guns due to units on your programme. I presume as this issue is nearly complete you will give us a fresh programme to work on?, we could show the number of guns required to complete the programme laid down by you on the state, but as we wire up all issues of MGs to you, could not a record be kept in your office?*"[70]

MG manufacturers (specifically Vickers Limited and the Royal Small Arms Factory) were also behind on fulfilling their production estimates. 160 guns were expected to be sent to the BEF by the end of January 1915,[71] but only 96 guns had been received by 4 February.[72] Even as of 13 March, the original request for a reserve of 100 guns to be held in France[73] could not yet be met due to these production delays.[74] GHQ advised raising the issue "again when we are nearer to completing the Cavalry and Infantry to four guns each. At present, there seems nothing to gain by pressing the point".[75] A reserve stock eventually began to be built on 20 October. It was determined that the size of an MG reserve should be based upon the attrition rates experienced over the previous twelve months of fighting, including the battle of Loos (19 September–6 October 1915) during which 233 of 2,373 MGs were replaced (9 per cent). Overall, the average loss rate over six months was 7.5 per cent; if periods of heavy fighting were excluded, a 6 per cent reserve (98 Vickers, 40 Lewis and nine Colts) was considered suitable.[76] However, the forming this reserve stockpile was postponed while brigade MG companies were formed in England,[77] but it was finally completed on 25 November, and only then were MGs from England sent to maintain it.[78] Given the expected role of Lewis guns in providing the automatic base of fire for the infantry battalion, their reserve was increased to 15 per cent of issued guns from March 1916.[79]

Alongside the establishment of reserve stocks, re-organisation and increasing the overall numbers of MGs in the BEF required a structured plan to formalise the deliveries. A programme received on 24 April 1915[80] provided a summary of any issues, replacements and increases that had happened already and the numbers held by units, noting that five guns had been issued to each of the 3rd, 4th and 5th Divisions in December 1914 for a "special purpose", disrupting the overall supply. The summary prioritised raising the establishment of the South and North Midlands Divisions to three guns per battalion as they occupied trenches for the first time. A fourth gun was then issued to other

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[66] War diaries of the IGC, available via: TNA, WO 95/3953/4_1 - IGC 1915 Feb (Part 4/1), pp. 47–48.
[67] War diaries of the IGC, available via: TNA, WO 95/3953/5_2 - IGC 1915 Feb (Part 5/2), p. 14.
[68] War diaries of the IGC, available via: TNA, WO 95/3953/6_1 - IGC 1915 Feb (Part 6/1), p. 38.
[69] War diaries of the IGC, available via: TNA, WO 95/3954/2 - IGC 1915 Mar (Part 2), pp. 57–58.
[70] War diaries of the IGC, available via: TNA, WO 95/3954/7 - IGC 1915 Mar (Part 7), p. 87.
[71] War diaries of the IGC, available via: TNA, WO 95/3952/1 - IGC 1915 Jan (Part 1), p. 29.
[72] War diaries of the IGC, available via: TNA, WO 95/3953/4_1 - IGC 1915 Feb (Part 4/1), p. 37.
[73] War diaries of the IGC, available via: TNA, WO 95/3950/1 - IGC 1914 Nov (Part 1), p. 75.
[74] War diaries of the IGC, available via: TNA, WO 95/3954/5 - IGC 1915 Mar (Part 5), p. 105.
[75] War diaries of the IGC, available via: TNA, WO 95/3954/1 - IGC 1915 Mar (Part 1), p. 147.
[76] War diaries of the IGC, available via: TNA, WO 95/3961/6 - IGC 1915 Oct (Part 6), pp. 54–56.
[77] War diaries of the IGC, available via: TNA, WO 95/3962/1 - IGC 1915 Nov (Part 1), p. 41.
[78] War diaries of the IGC, available via: TNA, WO 95/3962/8 - IGC 1915 Nov (Part 8), p. 11.
[79] War diaries of the IGC, available via: TNA, WO 95/3966/5 - IGC 1916 Mar (Part 5), pt. 36.
[80] War diaries of the IGC, available via: TNA, WO 95/3955/8 - IGC 1915 Apr (Part 8), pp. 62–68.

units “in their proper turn on the roster”.[81] A May 1915 programme revision showed 29 Vickers were due to be sent, and indicated that Maxims were no longer being made.[82] QMG adapted their plan so that regular battalions were equipped with the Vickers, releasing Maxims to TF battalions.[83] Cavalry regiments were informed that they were not to have four guns per regiment before infantry battalions did.[84] With the BEF now using more Vickers and the Army continuing to grow, the MGS requested 12 more Vickers for training purposes. This changed the priority to “replacement of casualties, eight Vickers to MGS, continue issuing to increase to four gun establishment”.[85] Armies took over MG allocations as they had better information on their divisions’ inventory and disposition. QMG and IGC now only received a periodical statement so they could request the necessary guns from England.[86] In June 1915, the demand for replacements continued to significantly outweigh the number of MGs returned to base for repairs: 122 Vickers were issued[87] with only 31 returned; 32 Colts issued with none returned; and 52 Maxims issued and 52 returned.[88] In some cases, it is possible that Maxims were reported as casualties simply to acquire replacement Vickers. In the middle of June, 110 Converted Maxims (that is, those converted from .577/450 to .303 British) were still in use alongside 545 Maxims (built as .303 guns) and 462 Vickers.[89] MGs began to arrive from England without prior requests as manufacturing output increased. The process for allotting MGs to armies instead of divisions required changes following the BEF’s re-organisation on 5 July 1915 because it altered their deployments and areas of operation. The 1st and 2nd Armies received four guns each out of every ten, while 3rd Corps would receive two.[90] From 17 July, five out of 11 MGs were provided to the 1st Army, while four were provided to the 2nd Army and two to the 3rd Army.[91]

The plan to equip infantry MG sections with four guns neared completion on 26 August 1915. At this point, the 1st Army had received all necessary MGs, while 17 were needed for the 2nd Army, six for the 3rd Army, and 14 for battalions on the lines of communication. This left the cavalry[92] and the Indian cavalry last, with no clear programme for equipping them (although one was expected in late September[93]).[94] Units reformed in August following the Second Battle of Ypres also needed MGs, but it was determined that these could not interfere with replacements for units in the line.[95] MGs were also moved across units: The 1st Battalion of the 4th Gurkha Rifles left the BEF and their equipment was transferred to other Meerut Division units which could thus be brought up to four MGs per infantry MG section immediately.[96] Notwithstanding the earlier supply lag, GHQ reported on 4 September 1915 that there were 108 Vickers with the British and 76 in the Indian Cavalry Corps, demonstrating the speed with which they had eventually been issued.[97] The remaining Maxims were to be exchanged for Vickers and then transferred to infantry battalions.[98] A complicated follow-up

[81] *Op*. *cit*., p. 64.
[82] War diaries of the IGC, available via: TNA, WO 95/3956/1 - IGC 1915 May (Part 1), p. 9.
[83] War diaries of the IGC, available via: TNA, WO 95/3956/3 - IGC 1915 May (Part 3), pp. 54–55.
[84] War diaries of the IGC, available via: TNA, WO 95/3956/6 - IGC 1915 May (Part 6), p. 64.
[85] War diaries of the IGC, available via: TNA, WO 95/3956/7 - IGC 1915 May (Part 7), pp. 6–8.
[86] War diaries of the IGC, available via: TNA, WO 95/3956/8 - IGC 1915 May (Part 8), pp. 79–85; War diaries of the IGC, available via: TNA, WO 95/3957/9 - IGC 1915 Jun (Part 9), pp. 28–30.
[87] War diaries of the IGC, available via: TNA, WO 95/3957/7 - IGC 1915 Jun (Part 7), p. 36.
[88] War diaries of the IGC, available via: TNA, WO 95/3957/3 - IGC 1915 Jun (Part 3), p. 32.
[89] War diaries of the IGC, available via: TNA, WO 95/3957/5 - IGC 1915 Jun (Part 5), p. 12.
[90] War diaries of the IGC, available via: TNA, WO 95/3958/4 - IGC 1915 Jul (Part 4), p. 3.
[91] War diaries of the IGC, available via: TNA, WO 95/3958/5 - IGC 1915 Jul (Part 5), p. 119.
[92] War diaries of the IGC, available via: TNA, WO 95/3959/6 - IGC 1915 Aug (Part 6), p. 71.
[93] War diaries of the IGC, available via: TNA, WO 95/3960/2 - IGC 1915 Sep (Part 2), p. 85.
[94] *Op*. *cit*., p. 14.
[95] War diaries of the IGC, available via: TNA, WO 95/3959/6 - IGC 1915 Aug (Part 6), p. 85.
[96] *Op*. *cit*., pp. 109–10.
[97] War diaries of the IGC, available via: TNA, WO 95/3960/3 - IGC 1915 Sep (Part 3), p. 11.
[98] *Op*. *cit*., p. 12.

on 9 September queried when this should happen: once the sections had four MGs or before?[99] The response received from the QMG on 11 September outlined a programme to complete the overall establishment up to 108 MGs, replace the three remaining Maxims with three Vickers, issue 36 Vickers to the Indian Cavalry Corps and then, finally, replace the 33 Maxims and 3 Converted Maxims in the Indian Cavalry Corps with 36 Vickers.[100] By the end of the month, the Indian Cavalry Corps had reached four MGs per regiment.[101] In May and June of 1916, it was proposed that the remaining Maxims in brigade MG companies would be exchanged for Vickers; however, by this time tanks were expected (the first mention in these diaries) and the Army Council did not want to cause delays to the supply of Vickers for them or the formation of more brigade MG companies. Furthermore, it was proposed that Maxims be retained in armoured cars in cases where weight was less of an issue.[102]

The Colt Automatic Gun

The Canadian Division used Colt automatic guns (see *Figure 2*), which, along with Ross rifles and Colt pistols, were unique from those used by the BEF and were supplied directly by Canada.[103] The QMG was concerned that replacement MGs would draw on BEF reserves, so a Colt reserve in France was desired (although there were 17 Colt guns held in England).[104] The Division lost eight Colts in action[105] during the Second Battle of Ypres. This battle had depleted all MG reserves, with only seven complete and six incomplete serviceable MGs held in France by 27 April.[106] Replacement Colts were not available by 12 May of that year, rendering the Division unsuitable to return to the line. It exemplified the wider problems relating to Colts and the overall MG position now that significant battles were taking place.[107]

Figure 2 *The Colt Automatic Gun as used by the Canadian Expeditionary Force (source: J. Bostock,* The Machine Gunners Handbook *(London: W. H. Smith, 1915)).*

More Colts were sent to Europe in August 1915, with 22 more from England, 50 from Canada, and a further 150 ordered from the manufacturer.[108] Of these latter guns, 16 were intended for the 1st

[99] War diaries of the IGC, available via: TNA, WO 95/3960/3 - IGC 1915 Sep (Part 3), p. 124.
[100] War diaries of the IGC, available via: TNA, WO 95/3960/4 - IGC 1915 Sep (Part 4), p. 78.
[101] War diaries of the IGC, available via: TNA, WO 95/3960/7 - IGC 1915 Sep (Part 7), p. 78.
[102] War diaries of the IGC, available via: TNA, WO 95/3968/3 - IGC 1916 May (Part 3), pt. 41.
[103] War diaries of the IGC, available via: TNA, WO 95/3953/1 - IGC 1915 Feb (Part 1), p. 85.
[104] War diaries of the IGC, available via: TNA, WO 95/3953/7 - IGC 1915 Feb (Part 7), p. 31.
[105] War diaries of the IGC, available via: TNA, WO 95/3955/2 - IGC 1915 Apr (Part 2), p. 58.
[106] War diaries of the IGC, available via: TNA, WO 95/3955/9 - IGC 1915 Apr (Part 9), p. 66.
[107] War diaries of the IGC, available via: TNA, WO 95/3956/5 - IGC 1915 May (Part 5), pp. 57–59, 117.
[108] War diaries of the IGC, available via: TNA, WO 95/3959/6 - IGC 1915 Aug (Part 6), p. 24.

Canadian Division, with six for the 2nd;[109] however, they had not been received by 21 November.[110] A formal list of spare parts and equipment to accompany Colt MGs was issued on 11 September 1915—despite these weapons having been on active service for a year, a list had not been written earlier.[111] Spares had been managed on an ad hoc basis, and the supply chain did not know what was required until this time. This became such a concern that, in April 1916, the BEF wrote to the WO suggesting Vickers be supplied to Canadian forces.[112] Canada also notified the BEF that no further Colts were available and suggested replacing it with Lewis guns mounted on tripods; however, given the BEF's earlier experience, this proposal was rejected and Vickers would instead be supplied once all British divisions in the UK had Vickers-equipped companies.[113]

The Lewis Automatic Rifle

As a result of the December 1914 proposal to redistribute Maxim and Vickers MGs into specific divisions,[114] it was decided that Lewis guns (see Figure 3) would equip the first six TF divisions going overseas. This released Maxims for the Regular divisions and meant that TF battalions could be equipped with two guns per section.[115] Furthermore, "in view of the great difficulty experienced in obtaining an adequate supply of Vickers guns it has been decided to send out eight [Lewis] for trial and report".[116] The inclusion of Lewis guns as an alternative MG satisfied the demand for automatic firepower yet it also required many different accessories and specific logistical support.[117] The subsequent report recognises the Lewis' limitation in rapid and sustained fire compared with the Maxim and Vickers; nonetheless, it was recommended that four Lewis guns be provided per section until the Vickers became available.[118] The WO wrote to the BEF for clarification as to whether this increased the MGs per section to eight (four Vickers or Maxim and four Lewis) or whether the Lewis MGs would be issued in lieu of the others.[119] The surprising response, given the shortages of the period, was that Lewis guns would be additional to the other four MGs, for a total of eight MGs per section.[120]

[109] War diaries of the IGC, available via: TNA, WO 95/3960/4 - IGC 1915 Sep (Part 4), p. 20.
[110] War diaries of the IGC, available via: TNA, WO 95/3962/9 - IGC 1915 Nov (Part 9), p. 11.
[111] War diaries of the IGC, available via: TNA, WO 95/3960/4 - IGC 1915 Sep (Part 4), pp. 114–15.
[112] War diaries of the IGC, available via: TNA, WO 95/3967/3_2 - IGC 1916 Apr (Part 3/2), pt. 73.
[113] War diaries of the IGC, available via: TNA, WO 95/3967/4_1 - IGC 1916 Apr (Part 4/1), pts 48–49.
[114] War diaries of the IGC, available via: TNA, WO 95/3952/2 - IGC 1915 Jan (Part 2), pp. 38–44.
[115] *Op. cit.*, p. 44.
[116] War diaries of the IGC, available via: TNA, WO 95/3954/7 - IGC 1915 Mar (Part 7), p. 142.
[117] War diaries of the IGC, available via: TNA, WO 95/3954/8 - IGC 1915 Mar (Part 8), p. 97.
[118] War diaries of the IGC, available via: TNA, WO 95/3956/6 - IGC 1915 May (Part 6), pp. 106–7.
[119] War diaries of the IGC, available via: TNA, WO 95/3956/8 - IGC 1915 May (Part 8), p. 100.
[120] War diaries of the IGC, available via: TNA, WO 95/3957/4 - IGC 1915 Jun (Part 4), p. 62.

Figure 3 *The Lewis gun mounted on Mark IV tripod as first used, flanked by Vickers MGs (source: Vickers MG Collection & Research Association, object № V10644).*

About 30 Lewis guns per week were expected to arrive in July of 1915.[121] The distribution of Lewis guns was planned with specific divisions prioritised, although the initial allocation was only one gun per battalion.[122] This was because those specific divisions had arrived in France with three MGs, and four total was the establishment needed.[123] In September, 78 Lewis guns were allotted to the 2nd Army, bringing their battalions up to four guns each.[124] A further specific request was made on 4 September that the Guards Division would be issued four Lewis guns (for training the whole division) ahead of other requirements.[125] The guns also needed more magazines, with 64 per gun recommended, up from 12.[126] Although initially part of the Lewis equipment, the Mark IV tripod was not used with the Lewis after 1915 (see *Figure 6*),[127] as the gun was suitable for light automatic fire only.[128]

Alternatives: The Hotchkiss & the German Maxims

To increase MG supplies from April to August 1915, other machine gun options were considered. As well as the Hotchkiss (see below), the Rexer, Madsen, and Berthier 'automatic rifles' were assessed.[129] Their acquisition would not impact the manufacture of other guns as the infrastructure needed for their manufacture was not already committed and was located outside of the UK.[130] The Danish Madsen rifle was eventually trialled, and the BEF recommended adding two to each cavalry regiment and infantry battalion to supplement their existing MGs.[131] While fit for purpose, however, the Madsen could not be exported from Denmark directly due to their neutrality and diplomatic

[121] War diaries of the IGC, available via: TNA, WO 95/3958/3 - IGC 1915 Jul (Part 3), p. 117.
[122] War diaries of the IGC, available via: TNA, WO 95/3958/5 - IGC 1915 Jul (Part 5), p. 7.
[123] War diaries of the IGC, available via: TNA, WO 95/3958/7 - IGC 1915 Jul (Part 7), p. 126.
[124] War diaries of the IGC, available via: TNA, WO 95/3960/2 - IGC 1915 Sep (Part 2), p. 79.
[125] *Op. cit.*, p. 129.
[126] War diaries of the IGC, available via: TNA, WO 95/3960/6 - IGC 1915 Sep (Part 6), p. 114.
[127] The Mark IV tripod remained in service with the Maxim and Vickers MGs.
[128] War diaries of the IGC, available via: TNA, WO 95/3961/5 - IGC 1915 Oct (Part 5), p. 106.
[129] War diaries of the IGC, available via: TNA, WO 95/3959/5_1 - IGC 1915 Aug (Part 5/1), p. 2.
[130] War diaries of the IGC, available via: TNA, WO 95/3955/1 - IGC 1915 Apr (Part 1), p. 36.
[131] War diaries of the IGC, available via: TNA, WO 95/3957/5 - IGC 1915 Jun (Part 5), pp. 32–33.

attempts to find a suitable route were unsuccessful.[132] The consideration of other options was overtaken by the supply and introduction of the Hotchkiss.

In August 1915, the Hotchkiss (see *Figure 4*) was accepted for BEF service. It was planned to be available from March 1916 at 200 guns per month, together with a "very largely increased" supply of Vickers and Lewis guns.[133] A technical report prepared by the School of Musketry in September opined that the Hotchkiss "is thought to be the most efficient gas-operated air-cooled gun now in existence" and better for land service than the Lewis or Madsen; however, the reluctance to introduce yet another MG model was a principal concern for the WO and BEF.[134] The first instruction to issue two Hotchkiss guns per cavalry squadron came on 23 February 1916, with the intent to increase to one per troop, in lieu of the Vickers, which were to equip the brigade MG squadrons.[135] The first Hotchkiss MGs were issued for instructional purposes to each Army, the MGS, and the 1st Cavalry Division in March 1916.[136] The first substantial issues was of 50 guns to the 3rd Cavalry Division on 22 March—evidence of a swift rollout.[137]

Figure 4 *The Vickers and Hotchkiss guns in training with the Motor Machine Gun Service circa 1915 (Source: Graham Sacker Collection, Vickers MG Collection & Research Association, object № SKR00002.1.6).*

Additionally, MG shortages in 1915 resulted in investigations into the possibility of converting German Maxims to fire British ammunition. QMG ordered that, if captured, the German MGs should be taken (along with their tripods, spare parts, and accessories) and then used in their own MG sections.[138] However, despite the conversion process being ostensibly simple—requiring only a

[132] War diaries of the IGC, available via: TNA, WO 95/3955/5 - IGC 1915 Apr (Part 5), p. 119.
[133] War diaries of the IGC, available via: TNA, WO 95/3959/5_1 - IGC 1915 Aug (Part 5/1), p. 49.
[134] War diaries of the IGC, available via: TNA, WO 95/3960/6 - IGC 1915 Sep (Part 6), pp. 80–81.
[135] War diaries of the IGC, available via: TNA, WO 95/3965/5_1 - IGC 1916 Feb (Part 5/1), pp. 82–83.
[136] War diaries of the IGC, available via: TNA, WO 95/3966/8 - IGC 1916 Mar (Part 8), pt. 16.
[137] War diaries of the IGC, available via: TNA, WO 95/3966/9 - IGC 1916 Mar (Part 9), pt. 62.
[138] War diaries of the IGC, available via: TNA, WO 95/3956/7 - IGC 1915 May (Part 7), p. 105; TNA, WO 95/3958/5 - IGC 1915 Jul (Part 5), p. 125.

change in barrel and lock[139]—the requirement for spares and other consumables which needed to be constantly available complicated matters.[140] The French did not use a Maxim-type weapon, so they handed captured guns to the BEF for conversion, with 100 given on 26 May. The WO sent .303-inch locks and barrels to France, but noted that the sighting would be different due to the change in calibre without a change to sights.[141] Another possible source of additional weapons was identified in those captured Maxims that had been sent to the UK as trophies or for training purposes, and it was suggested they be returned to Europe for front-line use.[142] This was complicated by the regiments that had captured the guns claiming them.[143] Moreover, only five had been sent to England to be used for training, meaning very few were actually freed up by this proposal.[144] By the time the first 30 guns were received from the French, infantry battalions were at full strength and the cavalry were only using the Vickers.[145] The numbers were small and the need was no longer required due to the numbers of Lewis and Vickers becoming available, as well as the formation of the brigade MG companies standardising the organisation.

Formation of the MG Companies

In July 1915, the first concept for a specialist MG company per infantry brigade (see *Figure 5*) was presented. The original plan called for each MG company to be equipped with 16 Lewis guns (including the four additional Lewis guns per battalion mentioned in early June[146]), counter to the established view that the original organisation was based around the Vickers and its particular capabilities. .[147] GHQ sent a letter in August to the Armies asking for their views. It was considered viable, but until each battalion had received four MGs, they would not have any moved to other divisions. Personnel were provided by battalions until a new Corps could be formed and provide replacements for the MG sections. This Corps would train BEF troops in the Vickers, Maxim, and Lewis, and the personnel would be interchangeable between regimental MG sections and brigade MG companies.[148]

[139] War diaries of the IGC, available via: TNA, WO 95/3958/5 - IGC 1915 Jul (Part 5), p. 125.
[140] War diaries of the IGC, available via: TNA, WO 95/3957/9 - IGC 1915 Jun (Part 9), p. 107.
[141] War diaries of the IGC, available via: TNA, WO 95/3956/8 - IGC 1915 May (Part 8), pp. 41–42.
[142] War diaries of the IGC, available via: TNA, WO 95/3957/1 - IGC 1915 Jun (Part 1), p. 6.
[143] War diaries of the IGC, available via: TNA, WO 95/3957/3 - IGC 1915 Jun (Part 3), pp. 60–61; TNA, WO 95/3957/7 - IGC 1915 Jun (Part 7), p. 63.
[144] War diaries of the IGC, available via: TNA, WO 95/3957/6 - IGC 1915 Jun (Part 6), p. 76.
[145] War diaries of the IGC, available via: TNA, WO 95/3960/3 - IGC 1915 Sep (Part 3), p. 94.
[146] War diaries of the IGC, available via: TNA, WO 95/3958/3 - IGC 1915 Jul (Part 3), p. 61.
[147] C.D. Baker-Carr, *From Chauffeur to Brigadier* (London: Hazell, Watson & Viny Ltd, 1930), pp. 102–105*;* G.S. Hutchison, *Machine Guns: Their History and Tactical Employment* (London: Macmillan and Co., Limited, 1938), pp. 142–144.
[148] War diaries of the IGC, available via: TNA, WO 95/3959/6 - IGC 1915 Aug (Part 6), p. 111.

Figure 5 *A four-gun section of an MG Company with their limbered wagon and horses, circa 1918, after being formed into an MG Battalion (source: Graham Sacker Collection, Vickers MG Collection & Research Association, object № SKR00002.8.2).*

With the supply of MGs assured, the BEF planned to establish a brigade MG company of sixteen Vickers and a battalion MG section of four Lewis guns. No further motor MG batteries were sent to France until all of this was completed. 1,200 Lewis guns were needed, and the completion of this supply was not expected until December. Cavalry regiments would be equipped with six Lewis (later Hotchkiss) guns, needing a total of 270 more, but not before the infantry. A further 706 Vickers were needed to complete 48 brigade MG companies. The Canadians were expected to man their own companies and sections using the Colt MG.[149] When formed, there would still be a mix of Maxims and Vickers in the same companies and therefore exchanges between companies were needed.[150] These exchanges depended upon the availability of Lewis guns to free up the Vickers and Maxims. A revised timetable was distributed on 29 September 1915, with completion not expected until February 1916. Vickers-equipped companies would come from England by the end of January 1916 for the 2nd, 3rd, and 4th Armies, as they already had Lewis guns. This major reorganisation included 111 new brigade MG companies across 37 divisions.[151] The 9th Division confirmed they had the full Lewis complement by 1 October 1915 and wished to form companies, but the adjustment of transport needed to be confirmed and they had to wait.[152] 52 Lewis guns allocated to 9th Division were transferred to the 28th Division; however, this was a temporary training loan and shared with the 2nd and 7th Divisions.[153] Seven guns were subsequently unaccounted for at a time when each item was critical,[154] then found to be lost in an action that the guns should not have been a part of.[155]

[149] War diaries of the IGC, available via: TNA, WO 95/3960/3 - IGC 1915 Sep (Part 3), pp. 76–84.
[150] War diaries of the IGC, available via: TNA, WO 95/3960/1_2 - IGC 1915 Sep (Part 1/2), pp. 63–64.
[151] War diaries of the IGC, available via: TNA, WO 95/3960/7 - IGC 1915 Sep (Part 7), pp. 110–13.
[152] War diaries of the IGC, available via: TNA, WO 95/3961/3 - IGC 1915 Oct (Part 3), p. 18.
[153] *Op. cit.*, pp. 67–68.
[154] War diaries of the IGC, available via: TNA, WO 95/3961/5 - IGC 1915 Oct (Part 5), pp. 110–12.
[155] *Op. cit.*, p. 141.

With the MGC formed on 14 October 1915,[156] the programme for brigade MG companies and regimental MG sections would be completed by March 1916. It remained an option to replace the Lewis with the Vickers if enough became available,[157] but an alternative plan was proposed that suggested equipping battalion MG sections with the Vickers and using a total of eight Lewis guns at the company level as an automatic rifle. According to the plan, if the battalion section could not be armed with the Vickers, then a second brigade company should be considered.[158] Instead, by March 1916, a divisional-level company was proposed, and then a second planned as numbers allowed. This was agreed[159] but only partially realised, with a divisional company added after April 1917.[160] By 1 November 1915, the Guards had received authorisation to form companies as their MG numbers were complete.[161] Cavalry MG squadrons had six Vickers per squadron (two per regiment). As the infantry was not expected to complete the establishment of their companies before spring 1916, the BEF proposed that another weapon, such as the Light Hotchkiss, be trialled for use with the cavalry regiments to reduce delays waiting for Lewis guns and allow the Maxim and Vickers MGs to be replaced by a lighter, more mobile, weapon.[162] This was formalised on 27 December.[163] The first completed brigade MG companies from England were sent across complete after 23 December 1915.[164] MG returns by early January 1916 showed that there were enough available to send 50 MGs to Egypt.[165] With BEF numbers now met, it was evident that the main problem was now with standardisation. The Commander-in-Chief wrote on 17 January that a procedure had been put in place to manage the different MG types due to brigades being exchanged between New and Regular Divisions. There was also a need for some brigade MG companies to have their Lewis guns exchanged.[166] The brigade MG company proposals were met by February 1916, so a programme was issued to increase the number of Lewis guns per battalion from four to six,[167] and then to eight guns. Once they had eight Lewis guns, two were allocated to each infantry company, and the battalion MG section ceased to exist.[168] The first allocation of weapons to equip each battalion with eight Lewis guns was requested on 22 March.[169]

The Canadians were to be issued the Lewis in lieu of Colts, but this was suspended in late January or early February 1916 while supply to the BEF was prioritised. The 3rd Army received additional Lewis guns first, followed by the 1st and 2nd Armies (alternating between them, one division at a time).[170] Progress with brigade MG companies was such that, as of 5 February 1916, of 21 British divisions three had just one or two companies formed, four divisions had no companies, and two divisions were awaiting Lewis guns. The Canadian divisions only had two companies across the three divisions.[171] On 21 March, the WO enquired as to whether the BEF had sufficient Lewis MGs to temporarily supply the Canadians whilst they awaited their own deliveries from Savage in the United

[156] War Office, *Army Order 414* (London: His Majesty's Stationery Office, 1915), available at TNA , WO 123/57–
[157] War diaries of the IGC, available via: TNA, WO 95/3961/6 – IGC 1915 Oct (Part 6), pp. 59–60.
[158] War diaries of the IGC, available via: TNA, WO 95/3962/3 – IGC 1915 Nov (Part 3), pp. 19–20.
[159] War diaries of the IGC, available via: TNA, WO 95/3967/3_2 – IGC 1916 Apr (Part 3/2), pt. 31.
[160] Becke, 2007, pp. 126–127.
[161] War diaries of the IGC, available via: TNA, WO 95/3962/1 – IGC 1915 Nov (Part 1), p. 3; TNA, WO 95/3961/7 – IGC 1915 Oct (Part 7), p. 107.
[162] War diaries of the IGC, available via: TNA, WO 95/3963/3 – IGC 1915 Dec (Part 3), pp. 8–9.
[163] War diaries of the IGC, available via: TNA, WO 95/3963/8 – IGC 1915 Dec (Part 8), p. 17.
[164] War diaries of the IGC, available via: TNA, WO 95/3963/7 – IGC 1915 Dec (Part 7), p. 117.
[165] War diaries of the IGC, available via: TNA, WO 95/3964/4 – IGC 1916 Jan (Part 4), p. 141.
[166] War diaries of the IGC, available via: TNA, WO 95/3964/5 – IGC 1916 Jan (Part 5), pp. 120–21.
[167] War diaries of the IGC, available via: TNA, WO 95/3965/4_2 - IGC 1916 Feb (Part 4/2), pp. 19–22.
[168] War diaries of the IGC, available via: TNA, WO 95/3965/5_1 - IGC 1916 Feb (Part 5/1), p. 46.
[169] War diaries of the IGC, available via: TNA, WO 95/3966/9 - IGC 1916 Mar (Part 9), pt. 63.
[170] War diaries of the IGC, available via: TNA, WO 95/3965/4_2 - IGC 1916 Feb (Part 4/2), pp. 19–22.
[171] *Op. cit.*, pp. 48–49.

States.[172] This was agreed, but delayed the increase to six Lewis guns per battalion.[173] On 4 February, the 3rd Army decided that the Canadian Cavalry Brigade would use Vickers and form a brigade MG squadron.[174] By May 1916, MG supply had stabilised and reserves were restocked as required. There were additional new demands (which were not accounted for in the MG statements) from the Heavy Section MGC (British tank units), the Royal Flying Corps, and the French Air Service[175] and the potential for a fourth MG company in each division. Colts and Maxims were all scheduled to be replaced by the Vickers and training establishments were expanded.[176] As the Australian and New Zealand Army Corps arrived in France, they also required more MGs to ensure they matched the BEF organisation so that they could be follow the same doctrinal and logistical arrangements. They were thus added to the lists of units which needed to be brought up to strength.[177]

Conclusion

The issue and use of machine guns in the BEF grew rapidly in the early years of the First World War. From the initial 144 Maxims and Vickers held by the BEF at the outbreak the war, as of November 1916 it was reported that 12,389 MGs were held across the forces fighting in France. The variety and complexity of this expansion was dramatic yet essential for the new type of warfare represented by the 'Great War'. MG production and distribution lagged behind the growth in personnel,[178] but followed a similar profile (see *Figure 6*).

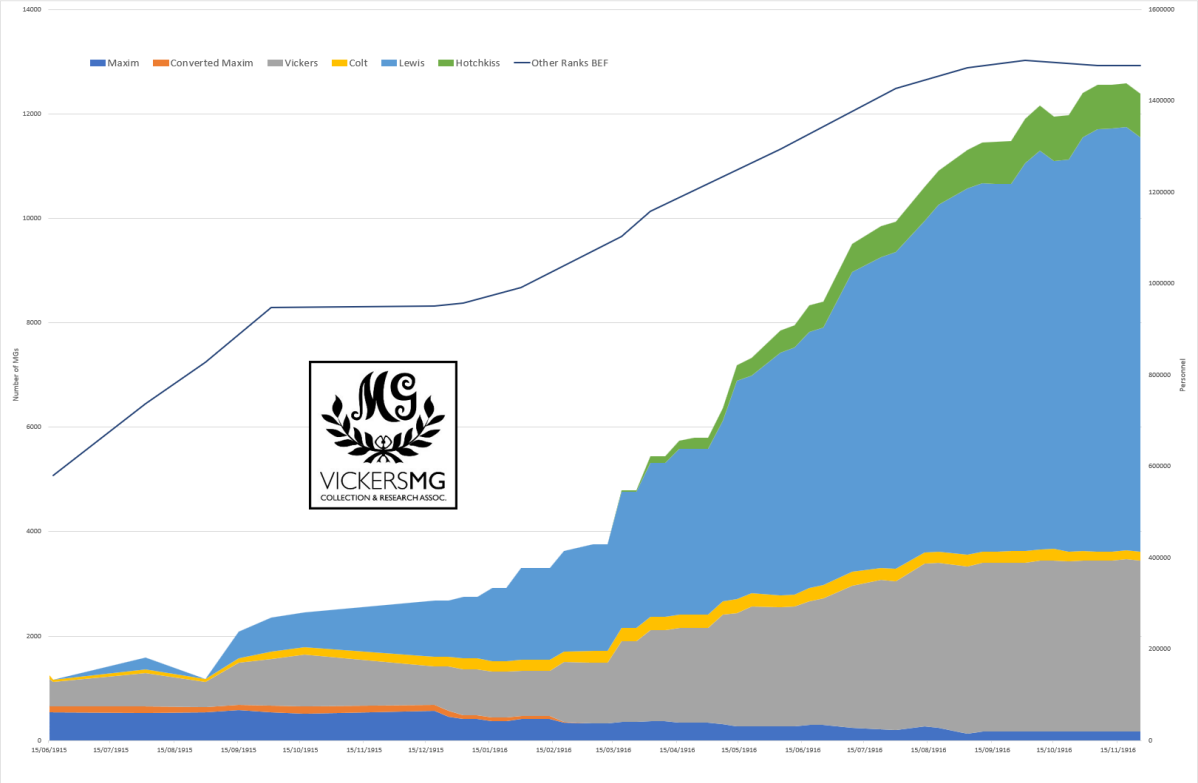

Figure 6 *Number and types of MGs in BEF possession compared with the growth of personnel (source: War Diaries of the IGC, 1915-1916, available from the National Archives, and personnel data*

[172] War diaries of the IGC, available via: TNA, WO 95/3966/7 - IGC 1916 Mar (Part 7), p. 65.
[173] War diaries of the IGC, available via: TNA, WO 95/3966/8 - IGC 1916 Mar (Part 8), p. 33.
[174] War diaries of the IGC, available via: TNA, WO 95/3965/2_2 - IGC 1916 Feb (Part 2/2), pp. 58–59.
[175] War diaries of the IGC, available via: TNA, WO 95/3967/3_2 - IGC 1916 Apr (Part 3/2), pp. 29–30.
[176] War diaries of the IGC, available via: TNA, WO 95/3968/5 - IGC 1916 May (Part 5), pp. 15–16.
[177] *Op. cit.*, p. 24.
[178] The War Office, *The Statistics of the Military Effort of the British Empire during the Great War* (London: His Majesty's Stationery Office, 1922)), facing p. 64.

from War Office, Statistics of the Grear War (London: His Majety's Stationery Office, 1922), p64 facing. Data extracted by Richard Fisher).

Despite the different models all being called 'machine guns', their operating mechanisms, accessories, and spares were largely incompatible, leading to supply and support concerns. As a result, those in administrative and command roles had to consider the users of a particular model and what that meant for the personnel, doctrine, organisation, and logistics. The different MGs issued led to wider consequences than the specific supply of spares, accessories, or trained men—it was a problem for the interchangeability of brigades and battalions between the regular, TF, and new Divisions. Brigade MG companies formed in the UK rcould not be sent into reserve divisions or base depots as it was necessary to ensure they were attached to an appropriately equipped formation.[179] The legacy equipment of the Empire and Dominion countries made them incompatible with the larger BEF infrastructure and logistics, demonstrating the challenges of coalition and combined forces. Lieutenant General Robertson, Chief of Staff BEF, summarised the equipment situation on 2 September 1915:

> "*At the present time there are 4 types of MGs in use, namely the Maxim, the Vickers, the Lewis, and, in the case of the Canadian Division, the Colt. Of these the Lewis has the advantage in portability over the Maxim or Vickers, but is hardly capable of maintaining a sustained rapid fire to the same extent as the two latter.*"[180]

Changes to doctrine and organisation were constrained by logistics. The introduction of Motor MG Batteries stalled, and was nearly abandoned, because of the competition for MGs.[181] Additionally, the decision to develop brigade MG companies was coincidentally taken at the same time (in August 1915) as that to replace the Vickers in the infantry battalion with the Lewis gun, further complicating logistics.[182] By the end of the First World War, the Vickers had been consolidated into the 64-gun MG battalions of the MGC. Lewis guns were prolific across the infantry, with the Hotchkiss serving the cavalry. Maxims and Colts were no longer in front-line service, and all of the contributing British and Imperial nations had the same basic organisation for their MG units. From a simple beginning to a simple endpoint, the British Army had progressed through many difficulties in standardising its machine gun arrangements. Not only was there confusion with the administration, logistics, and organisation of MGs, but in terminology, too. The Vickers, Maxim, and Colt were termed 'machine guns', but the Lewis and Hotchkiss were merely 'guns', in an attempt to simplify matters and enable the emerging doctrine to be better understood.[183] In essence, although all were automatic weapons, they were to be used in very different roles, as would become evident in future years.[184] The availability of supplies was critical to the organisation, doctrine, and training of the various formations using machine guns, and contributed towards the conduct of the War—which may have been different were automatic firepower and the related equipment delivered in a more structured and organised manner.

Acknowledgements

The 2020 pandemic restrictions prevented physical access to the National Archives. They made their digital downloads free of charge and this resulted in the author reviewing a wider range of documents than normal, finding the IGC's diaries to be a rich seam of administrative information

[179] War diaries of the IGC, available via: TNA, WO 95/3964/5 - IGC 1916 Jan (Part 5), 1916, pp. 120–21. Letter dated 18 January 1916.
[180] War diaries of the IGC, available via: TNA, WO 95/3960/3 - IGC 1915 Sep (Part 3), p. 76.
[181] War diaries of the IGC, available via: TNA, WO 95/3959/1-2 - IGC 1915 Aug (Part 1/2), p. 30.
[182] War diaries of the IGC, available via: TNA, WO 95/3959/1-2 - IGC 1915 Aug (Part 1/2), p. 69.
[183] Although the author has standardised their terminology throughout this article.
[184] War diaries of the IGC, available via: TNA, WO 95/3965/5_1 - IGC 1916 Feb (Part 5/1), p. 48.

relating to machine gunnery. It is a reminder that these peripheral documents can yield very interesting material. Furthermore, the author's access to the archive and library of the Vickers MG Collection & Research Association enabled this study to take place when other archives and libraries were closed.

About the Author

Richard Fisher is a Research Fellow in the Cranfield Defence and Security Centre for Systems, Simulation and Analytics, where he delivers education to members of the UK's Ministry of Defence and the wider defence industry. Mr Fisher is also the Founder and Director of the Vickers MG Collection & Research Association, a not-for-profit organisation based in the UK that researches all aspects of military history relating to the Vickers machine gun. This includes regularly firing the Vickers and associated firearms, being one of the few UK organisations that can do so, and in 2022 they conducted a 16-gun 'company strength' demonstration of the Vickers to commemorate the centenary of the disbandment of the Machine Gun Corps.

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