Introduction

Looking back on the events of 1914, Brigadier-General (later Major-General Sir) Edward Spears likened the British Expeditionary Force (BEF) to

a giant with a quick and brilliant brain, but whose nervous system is slow, lethargic, and inadequate. Something goes wrong with one of his distant limbs. Hours pass before he registers it. Once he has done so a counter-move is rapidly devised, but transmission is again slow, and before his arm or leg can receive and obey it, it may have been gnawed to the bone.¹

Spears’ analogy neatly encapsulated the difficulties that tenuous communications posed for British commanders on the Western Front during the First World War as they struggled to exercise efficient command and control over their troops during the heat of battle. Indeed, in October 1932 one of the principal findings of the Committee on the Lessons of the Great War was that ‘without communication, command cannot function; it can neither receive information, nor get out its orders. The army is then fighting without a brain; or worse still, with a disordered brain which acts regardless of reality’.² Consequently, the end result for many of the BEF’s battles, as identified at a staff conference in January 1933, had been ‘confusion, huge casualties, [and] failure’.³ This interpretation of communications has become something of the orthodoxy within the popular and academic literature. Yet, it is a view that has failed


³ ‘Report on the Staff Conference Held at the Staff College, Camberley, 9–11 January, 1933’, WO32/3116, TNA.
to attract a detailed, scholarly enquiry, and thus, in many respects, it cannot be regarded as conclusive. In investigating one of the central challenges for British commanders during the First World War, this book seeks to rectify this curious anomaly, principally by attempting to answer one key question: how, and to what extent, did communications influence British military operations on the Western Front between 1914 and 1918? This book intends, then, to cast new light on British command and control practice and military performance by studying the oft-mentioned but frequently misunderstood role played by communications.

Because of the nature of trench warfare and the unprecedented human cost, issues concerning command and control during the First World War have been part of the debate over British military performance ever since the war ended. In general, much of the early literature falls between two very distinct categories: the ‘internal factor’ and ‘external factor’ schools of thought. The former subscribes to the view that the war was little more than ‘a murderous nightmare of misdirected heroism and pointless suffering’, blame for which rests firmly on the shoulders of the military high command. This ‘lions led by donkeys’ approach, first laid down by the polemic works of the interwar period and of the 1960s, has now been thoroughly discredited, though it still retains a small number of supporters, whose studies are ‘more than an impediment to the exploration of real issues’ and do nothing more than ‘preserve historical writing about the Great War in its ridiculously protracted adolescence’. The latter school of thought, meanwhile, emphasises the importance played by factors that were outside the control of the generals, such as the lack of artillery shells,

the shortage of trained officers and men and the restrictions imposed by coalition warfare. The most prominent exponent of the ‘external factor’ view was John Terraine, who did much to defend the reputation of British generalship.\textsuperscript{10} Although many historians have since acknowledged the important contribution he made to the debate,\textsuperscript{11} Terraine is not without his critics.\textsuperscript{12} In particular, by stressing the great extent to which external factors hampered British operations, Terraine tended to ignore the fact that the BEF undoubtedly suffered from its fair share of internal problems as well.\textsuperscript{13}

Since the early 1980s, however, ‘a new era of scholarship’, based largely upon the examination of archival material which had previously been unavailable or neglected, has provided a much more balanced assessment of the BEF.\textsuperscript{14} Building upon the pioneering works of historians such as Shelford Bidwell, Dominick Graham, Tim Travers, Robin Prior and Trevor Wilson,\textsuperscript{15} scholarly examinations of the BEF at the operational and tactical levels have deepened our understanding of British military conduct during the First World War.\textsuperscript{16} More specifically, a

\textsuperscript{10} For works by John Terraine, see: Mons: The Retreat to Victory (first published 1960; new ed., Ware: Wordsworth, 2002); Douglas Haig: The Educated Soldier (London: Hutchinson, 1963); The Road to Passchendaele: The Flanders Offensive of 1917: A Study in Inevitability (London: Leo Cooper, 1977); To Win a War: 1918, the Year of Victory (London: Sidgwick and Jackson, 1978); White Heat: The New Warfare, 1914–1918 (London: Sidgwick and Jackson, 1982); and, The Smoke and the Fire: Myths and Anti-Myths of War 1861–1945 (Barnsley: Leo Cooper, 1992).

\textsuperscript{11} See, for example, Gary Sheffield, ‘John Terraine as a Military Historian’, Journal of the Royal United Services Institute, 149 (2004), 70–5.

\textsuperscript{12} For an overview of the rivalry between Terraine and another famous British military historian, John Keegan, see Alex Danchev, “‘Bunking’ and Debunking: The Controversies of the 1960s”, in Bond (ed.), The First World War and British Military History, 273–8.

\textsuperscript{13} Bond, Unquiet Western Front, 72–3.


number of works have emerged within the past 20 years arguing that the BEF underwent a ‘learning curve’. Far from seeing the war as futile with needlessly heavy casualties for minimal military gain, historians such as Paddy Griffith, Gary Sheffield and Andy Simpson maintain that the British military command consistently analysed the mistakes and lessons of previous battles and began to improve the army’s tactical and operational efficiency. Collectively, these works have influenced a growing number of specialist studies, examining the less-glamorous, though crucial, ‘support services’ such as logistics, intelligence and staff work, which have also shown that by 1918 the BEF had developed into a highly sophisticated and extremely formidable institution. Indeed, it has been
further argued that these changes took place within the context of a ‘Revolution in Military Affairs’ (RMA), which gave birth to the ‘Modern Style of Warfare’.\textsuperscript{20}

Yet, despite this copious amount of scholarship there remains a dearth of detailed information on the subject of communications. Virtually all the literature published before Bidwell and Graham’s \textit{Fire-Power} is devoid of any detailed reference to communications. The exception to this was John Terraine, who rightly drew attention to the inadequacies of communications technology at the time. Arguing that the First World War was the only conflict in history in which the military commanders on both sides had no direct ‘voice control’ over their troops in battle, Terraine observed that once the troops went ‘over-the-top’ and out into ‘no-man’s-land’ and beyond, they passed out of the control of the generals, who ‘became quite impotent at the very moment when they would expect and be expected to display their greatest proficiency’.\textsuperscript{21} Although he highlighted the negative impact that communications had on command and control, Terraine did not develop his line of argument in any greater depth. This may largely be explained by his use of sources. While he made good use of published memoirs and the official history, he failed to utilize archival material that was made readily available at the end of the 1960s.\textsuperscript{22}

With regards to the more recent, archive-based studies of the First World War, analysis of the BEF’s communications system has been somewhat patchy. Bidwell and Graham’s \textit{Fire-Power} examined the development of artillery in the British Army between 1904 and 1945, yet devoted just three pages to the issue of communications during the Great War.\textsuperscript{23} Although Tim Travers’ \textit{The Killing Ground} dealt with the BEF’s tactical and operational decision-making process, particularly the internal problems within (General Headquarters) GHQ, it had very little to say about the practicalities of communications. The same is also true of his second book, \textit{How the War Was Won}, which focused...
specifically on the battles of 1917–18. Travers’ work is complemented by that of Martin van Creveld and Martin Samuels, who compare and contrast the British and German command philosophies during the war. Although both raised the issue of communications, neither provided a systematic analysis of the BEF’s communications system. Gary Sheffield and Dan Todman’s edited collection of essays, Command and Control on the Western Front, did pay more attention to communications than has been customary, but only to the extent of providing ‘snapshots’ of communications at certain points during the war. Meanwhile, Andy Simpson’s Directing Operations provided some revealing insights into the practice of command and control at the corps level of command, but was concerned primarily with the role and functions of corps as a whole, rather than just the issue of communications. Jonathan Boff’s recent study, Winning and Losing on the Western Front, also discusses communications but only from the point of view of Third Army’s operations during the ‘Hundred Days’ campaign in 1918. In fact, the BEF’s communication problems have received rather short shrift within most general accounts of individual battles and campaigns.

Notwithstanding Bill Rawling’s 1994 journal article, which, although instructive and well researched, is limited by its narrow focus on the

24 The main criticism of both books, however, is that they rely heavily upon post-war, anecdotal evidence, particularly the CAB45 files in the National Archives pertaining to the writing of the British official history. See: John Bourne, ‘Haig and the Historians’, in Brian Bond and Nigel Cave (eds.), Haig: A Reappraisal 70 Years On (Barnsley: Leo Cooper, 1999), 6–8; and, Simpson, Directing Operations, xix–xiii.

25 Martin van Creveld, Command in War (Cambridge, MA: Harvard University Press, 1985), 148–88; Martin Samuels, Command or Control?


28 Boff, Winning and Losing, 179–91.

Canadian Corps, there are only two studies that address exclusively the issue of communications on the Western Front. The first is Raymond Priestley’s *The Signal Service in the European War of 1914 to 1918 (France)*, published in 1921. Priestley was well qualified to write this history, having served as adjutant to the army’s Wireless Training Centre (1914–17) and then as a signal officer in 46 Division on the Western Front in 1918. However, besides predating the Second World War, Priestley’s dry and complex narrative has acted as a deterrent to historians wishing to understand communications. As Paddy Griffith opined, although ‘revealing and informative’, it is ‘positively the most impenetrable book ever written on the war’. The second study, Mike Bullock and Laurence A. Lyons’ *Missed Signals on the Western Front*, certainly provides a much easier and more understandable narrative than Priestley’s. Yet, not only is it hampered by its rather controversial and overly techno-centric counterfactual argument, but it also relies heavily upon Priestley for its source material and, as such, offers little in the way of fresh information about communications. The greatest limitation of both Priestley’s and Bullock and Lyons’ studies, however, is that they are severely constrained by their attempts to examine communications either solely through the exploits of the Royal Engineers Signal Service, or largely via the medium of communications technology. As important as the Signal Service and communications technologies were, they were but two elements within the confines of a much larger and intricate communications system which also involved the key elements of personnel, training and doctrine, and the integral processes of staff work and command. Thus, a more holistic approach, examining the interaction of all these

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32 Prior to the war, Priestley was appointed as geologist to both Ernest Shackleton’s (1907–9) and Robert Falcon Scott’s (1910–13) Antarctic expeditions. In 1934, he became the University of Melbourne’s first salaried vice-chancellor and in 1938 he was appointed principal and vice-chancellor of the University of Birmingham. See: S. Murray-Smith, ‘Priestley, Sir Raymond Edward (1886–1974)’, *Australian Dictionary of Biography*, National Centre of Biography, Australian National University, http://adb.anu.edu.au/biography/priestley-sir-raymond-edward-8116/text14173 [Accessed 1 September 2014].
33 Griffith, *Battle Tactics*, 266.
factors, is required in order to understand fully the BEF’s communications system and its influence upon operations.

Therefore, in order to understand communications in the context of the First World War, it is worth considering at the outset the large body of literature now available on communications in its broadest sense. This material can be viewed as falling into two categories: purely military studies and an ever-increasing body of social science literature. Both provide not simply an awareness of many of the issues surrounding communications, but also a better understanding of the terminology associated with this field. It is, for instance, very difficult to deal with communications without confronting the term command and control.\textsuperscript{36} Indeed, many scholars, military analysts and social science researchers would treat command, control and communications as one theme.

In laying down the duties of command in battle, the 1909 British Army Field Service Regulations stipulated that a commander ‘influences the general course of the action by his preliminary dispositions, which determine the direction of the decisive attack, and the force with which it is to be delivered’. He could also influence the battle once it was under way by committing his reserves.\textsuperscript{37} With regards to control, the pre-war regulations prescribed the following philosophy:

The command of military forces is exercised on the following principles: the C.-in-C., aided by his Staff, exerts his authority over a limited number of subordinate commanders. These, aided by their staffs and assistants, convey his will to a limited number of subordinate commanders under them, each of whom carries it still down lower, until eventually all ranks are controlled by it.\textsuperscript{38}

These definitions do not differ dramatically from those utilized by the modern British Army. According to the 2006 United Kingdom Glossary of Joint and Multinational Terms and Definitions, command is ‘the authority vested in an individual of the armed forces for the direction, co-ordination, and control of military forces’. Control is defined as ‘the

\textsuperscript{36} This is usually referred to as ‘C\textsuperscript{2}'. Since the late 1970s the simple equation of C\textsuperscript{2} has been replaced and expanded by a whole host of acronyms and abbreviations, each of which seeks to emphasise a particular feature within the system. These include C\textsuperscript{3} (Command, Control and Communications), C\textsuperscript{3}I (Command, Control, Communications and Intelligence), C\textsuperscript{4}I (Command, Control, Communications, Computers and Intelligence) and C\textsuperscript{4}ISR (Command, Control, Communications, Computers, Intelligence, Surveillance and Reconnaissance). See Thomas P. Coakley, Command and Control for War and Peace (Washington, DC: National Defence University Press, 1992), 9.


\textsuperscript{38} Field Service Regulations Part II: Organisation and Administration (1909) (Reprinted, with Amendments, October 1914) (London: HMSO, 1914), 25.
process through which a commander, assisted by his Staff, organises, directs and co-ordinates the activities of the force allocated to him’. 39

Put simply, if command is what a commander does, then control is how he does it. 40 Combined, a command and control system is ‘an assembly of equipment, methods and procedures and, if necessary, personnel, that enables commanders and their staffs to exercise command and control’. 41

The degree of control that a commander seeks to impose upon his subordinates, however, is a contentious issue, with military historians and modern defence analysts frequently making reference to two contrasting methods: ‘restrictive’ and ‘mission’ command. 42 In the former, a commander issues detailed orders to his subordinates which prescribe exactly what they are to do and how they are to achieve it. If, during the course of carrying out those orders, the plan needs to be amended, subordinates are expected to refer to the commander for official guidance and approval. In the latter, meanwhile, general orders and objectives are issued, but subordinates are given a degree of flexibility in terms of choosing the methods that are to be employed to achieve them. 43 Within the context of the literature on the First World War, the general consensus amongst historians has been that the Germans were the leading practitioners of mission command, while the British favoured restrictive command, 44 though these views have been challenged in recent years. 45

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39 United Kingdom Glossary of Joint and Multinational Terms and Definitions, Joint Doctrine Publication 0–01.1 (June 2006), 68, 76.
40 Dan Todman and Gary Sheffield, ‘Command and Control in the British Army on the Western Front’, 1.
41 United Kingdom Glossary, 69.
42 Also referred to as Befehlstaktik and Auftragstaktik, respectively. For additional context, see Eitan Shamir, Transforming Command: The Pursuit of Mission Command in the US, British and Israeli Armed Forces (Stanford, CA: Stanford University Press, 2011).
44 Travers, The Killing Ground and How the War Was Won; Samuels, Command or Control?; and, van Creveld, Command in War.
45 It has been argued that by 1918 the German Army’s command system had become highly centralized under Erich von Ludendorff’s leadership. See Boff, Winning and Losing, 226–42. Most historians now tend to agree that the BEF was exercising a more decentralized style of command during the summer and autumn of 1918, but they disagree as to how this came about and how consistently it was applied. See: Prior and Wilson, Command on the Western Front, 300, 305, 396–7; Harris with Barr, Armies to the Armistice, 149; Peter Simkins, “Building Blocks”: Aspects of Command and Control at
From a multi-disciplinary perspective, however, command and control means different things to different people and, as such, no universally accepted theory has been developed. Quite often, these theories are conveyed through the medium of charts or diagrams, which represent the flow of information within an organizational decision-making cycle. With regards to the military models, three such examples will suffice. The first is Joel Lawson’s cybernetic model, which he argued was applicable to any echelon of the military hierarchy. Lawson divided the command and control system into five internal sub-systems or functions (Sense, Process, Compare, Decide, Act) which any military commander would have to go through in order to make ‘effective use of resources to deal with an external hostile environment’. Two models that further highlight the decision-making process of a commander are J. G. Wohl’s ‘SHOR’ paradigm and John Boyd’s ‘OODA’ loop or ‘Boyd Cycle’. Essentially, both ‘SHOR’ (Stimulate, Hypothesis, Option, Response) and ‘OODA’ (Observe, Orientate, Decide, Act) amount to the same thing: the commander who goes through his decision cycle fastest is likely to gain the upper hand over his slower opponent.

What is significant about all three models is the considerable emphasis that each places upon the receipt of timely and accurate information. In


other words, communication is at the very heart of a military command and control system. As Lars Skyttner has observed:

The most important quality in a system of command and control is the ability to send, store, present and deliver data and information in the shape of messages... In an organisation, data and information transfer is the main tool to coordinate and control that the goal of the operation is fulfilled.49

The literature of business studies and organization theory reinforces the argument that communication is the most pervasive feature of any organization and is paramount in determining its smooth running and overall efficiency.50 It also suggests that there is much more to communications than just technology. As Martin van Creveld points out, command and control is very much a human activity, where a commander’s ideas and decisions are just as integral to the system as are communications and the information processing apparatus: ‘No single communications or data processing technology, no single procedure or method, is in itself sufficient to guarantee the successful or even adequate conduct of command in war’.51 Furthermore, the practice of command and control is not as simple or as straightforward as the theory of command and control as laid out in models such as ‘OODA’.52 As Clausewitz noted, friction, chance and uncertainty render the simplest things in war very difficult.53 According to Edward Luttwak, ‘errors ... in military command-and-control structures ... are virtually inevitable’.54 Thus, the use of inter-disciplinary tools and approaches allows us to attempt an analysis of the BEF’s communications system in a rather less one-sided manner than has so far been the case, since existing works on British communications have focused

predominantly on technology at the expense of an understanding of the wider communications system.

Communications, as can be seen from the foregoing discussion, is a crucial component of command and control, but within the historiography of the First World War one generally taken for granted or viewed simply through the prism of technology. As the relevant social science literature demonstrates, however, there is much more to communications than just technology. It is impossible, for example, to study communications within a military context without making reference to the closely related subjects of information and doctrine. Considering the role of communications in the BEF, a clear distinction needs to be made between these terms. At the same time, analysing the close relationship among communications, information and doctrine promises new insights into some of the major historiographical controversies surrounding the performance of the BEF. Given their importance for this study, therefore, all three terms – communications, information and doctrine – warrant closer examination and better understanding.

The term which obviously requires definition first is communications. In a study of naval warfare, Andrew Gordon argued that the term C³ is ‘dangerously misleading’ because it wrongly implies that communications is on the same level of importance as command and control. Seeing communications as ‘merely a means to an end’, he stated that another way of achieving effective command and control was through doctrine. 55 While Gordon is undoubtedly correct in highlighting the importance of doctrine within a command and control system, he underestimates the significance of communications. Much depends on the definition one uses. For the purpose of this study, communications will be understood to be

the provision and passing of information and instructions which enable … [an] organisation to function efficiently and employees to be properly informed about developments. It covers information of all kinds which can be provided; the channels along which it passes; and the means of passing it. 56

This definition allows us to view communications as more than just a mere ‘service provider’. It is the interchange of information involving a whole host of technical and non-technical means, without which command and control cannot be accomplished. Indeed, as one signal officer during the interwar period put it, ‘Under all conditions of war,
communication is command'. 57 A communications system, therefore, is the combination of equipment, methods, procedures and personnel, organised to accomplish the conveyance of information. 58 This implies that there is more than just a simple one-to-one link. The more effective the system is, the more successfully an organisation can interact and function effectively. 59 Thus, an efficient communications system is an essential prerequisite for the successful prosecution of modern war.

Another key term used throughout this study is information. According to one writer, information refers to ‘the words, numbers, images and voices that are flowing from one point to another in an orderly fashion, that impart meaning, that inform the information consumer, and that have the potential for influencing the future state of affairs’. 60 To place the term within its historical context, Lieutenant-General Sir John Monash, GOC Australian Corps in 1918, noted:

The vital information, which is imperative for the ... Commander to have accurately and rapidly delivered throughout the course of a battle, is that relating to the actual position, at any given moment in time, of our front line troops; showing the locations which they have reached, and whether they are stationary, advancing or retiring. 61

Thus, in terms of Monash’s definition, it can be surmised that information is not the same as intelligence. While information ‘refers to the location and activities of friendly troops’, intelligence ‘is the order of battle, dispositions and possible intentions of the enemy’. 62 Within the context of this book, therefore, it is important that information is not inadvertently equated or confused with intelligence. It is also important to realise that information on its own is meaningless unless

an organisation has an efficient system for gathering, processing, storing and disseminating it. For information to be meaningful, it must be analysed and interpreted. Once processed and understood, information becomes knowledge.\textsuperscript{63} Organisations can improve their information processing through a combination of training personnel, developing and embracing new processing techniques and reorganising the system.\textsuperscript{64} The ability to convert information into knowledge and then knowledge into action accurately and rapidly lies at the very heart of the military decision-making process, and is therefore critical to enhancing military performance.

Given the frequency with which it is used in discussions of communications and information, \textit{doctrine} is the third term which requires clarification. Unfortunately for historians, it has proven a rather difficult concept to define. For example, while Bidwell and Graham identify doctrine as the ‘study of weapons and other resources and the lessons of history, leading to the deduction of the correct strategic and tactical principles on which to base both training and the conduct of war’\textsuperscript{65}, according to Ian Malcolm Brown, doctrine refers to ‘a set of rules, regulations, and methods that, taken together, describe how an army will approach battle’.\textsuperscript{66} Another definition is that provided by a former US Air Force officer, I. B. Holley Jr., who defines doctrine as ‘the “tried and true”, the one best way to do the job which has been hammered out by trial and error, officially recognised as such, and then taught as the best way to achieve optimum results’.\textsuperscript{67} The search for a correct definition of doctrine also requires an understanding of the doctrinal process – that is, how doctrine within military organisations is developed. According to Holley, there are three essential elements that constitute the doctrinal process: first, the \textit{collection} phase, which involves the gathering of information from a wide variety of sources, based primarily


\textsuperscript{66} Brown, \textit{British Logistics}, 39.

upon the combat experience of one’s own forces; second, the *formulation* phase, whereby doctrinal statements are devised, revised and perfected largely through intellectual processes such as journals and conferences; and, third, the *dissemination* phase, which involves not only the dissemination of doctrine throughout the organisation, but also efforts to ensure that it is properly understood.\(^{68}\) Thus, despite the difficulties of reaching a clear definition, the process of collection, formulation and dissemination suggests that the end product is often a field manual or similar document.

It is clear, therefore, that the issue of communications is intimately related to a number of historical questions surrounding both information and doctrine in warfare. The interaction among these three factors is even more significant in the light of a number of ongoing historical controversies surrounding the BEF’s military performance. In essence, historians have still not resolved a number of issues relating to the gradual improvement of British battlefield performance during the war – these all relate to one central question: was it a result of improved tactical and operational methods, ultimately superior to those of the enemy, or more a combination of superior weight of manpower and matériel against weakening German resistance? The complexity of the communications process means that this study cannot hope to provide new perspectives without posing a series of specific sub-questions relating to a range of contentious issues concerning British operations on the Western Front.

First, an examination of communications draws attention to the flexibility of the BEF’s command and control system and, in particular, the extent to which the BEF showed signs of adaptability, one of the chief characteristics of a ‘learning organisation’.\(^{69}\) The increasing professionalism of the Signal Service is of particular significance given that its chief responsibility was to provide and maintain the BEF’s ‘nervous system’.


A definitive set of criteria, however, must be utilised in order to identify any noticeable improvements. According to M. A. Rice and A. J. Sammes, a successful military communications system must be able to deliver ‘real-time’ information, preserve the integrity of the information it carries, have the capacity to perform under the stress of battle and ensure that all information is kept secure.\(^7^0\) Using these criteria – speed, integrity, capacity and security – this study will assess how, and to what extent, there was an identifiable improvement in the BEF’s communications system during the course of the war.

Second, an assessment of the BEF’s communications system must also engage with the enduring and controversial debate concerning the relationship of the British military command and new technology. Contrary to the views of some historians,\(^7^1\) recent research has demonstrated convincingly that British commanders at all levels did encourage the development and employment of a range of new technologies, such as tanks, aeroplanes and poison gas.\(^7^2\) Detailed analysis of the interaction between British commanders and the latest communications technologies, however, has only recently begun to receive the attention it deserves, with opinion divided, in particular, with regards to the BEF’s use of wireless.\(^7^3\) Therefore, in an effort to shed further light and clarification on these issues, this study will assess how successful British commanders were at recognizing the utility of new communication technologies and whether or not they exploited their full military potential.

A third issue that a study of the BEF’s communications system raises is that concerning the development of doctrine. While doctrine has proved a difficult concept to define, complicating matters further for historians is the fact that the term ‘doctrine’ was itself rarely used within British military circles during the First World War. This has led a number of historians to argue that the British Army of the period had no doctrine, at

\(^7^0\) Rice and Sammes, *Communications and Information Systems*, 107–8.


least not in the narrow prescriptive sense. For Albert Palazzo, however, the BEF instead relied upon its ethos—‘the characteristic spirit and the prevalent sentiment, taste, or opinion of a people, institution, or system’—which provided its officers with ‘the means for interpreting the war and guiding their responses to its challenges’. Palazzo’s view is supported by Andy Simpson, who contends that the Field Service Regulations Part I (1909), in conjunction with the SS series of training pamphlets produced by GHQ throughout the war, provided the BEF with an effective and flexible set of principles through which it was able to plan and conduct operations on the Western Front. Still, even though the term ‘doctrine’ was seldom used during the war, the emergence of the SS training manuals, which conforms to the collection–formulation–dissemination model mentioned earlier, makes clear that the concept of doctrine is relevant to the study of the BEF. Hence, a study of communications cannot avoid confronting whether there is evidence which points to an effort to develop a communications doctrine and, if this was the case, asking whether it proved successful. This offers the potential of throwing light on the wider issue of the development of doctrine and its role in the BEF’s conduct of war.

Fourth, and finally, when considering the overall influence of communications upon the BEF’s military operations, it is difficult to avoid the debate on the ‘learning curve’. However, as already noted, although it is a concept that is now firmly rooted within the historiography, historians are divided over its usefulness as a means of evaluating British military performance. One problem in particular with the ‘learning curve’ concept is that it implies that the BEF as a whole underwent a smooth and steady incremental learning process. As the works of recent historians have highlighted, this was definitely not the case. It appears far more likely that the rate of learning varied across the ‘horizontal and vertical dimensions’ of the BEF’s military activities. Historians have also begun

76 Simpson, Directing Operations, xvi–xvii.
77 Todman, Great War, 82–3; Boff, Winning and Losing, 247–9.
to investigate how the BEF learned, focusing on the processes rather than just the outcomes. Therefore, an examination of communications presents the opportunity to reflect upon the nature of learning within the BEF.

By addressing these four issues, this study will provide fresh insight into how communications influenced the BEF’s operations and, in the process, shed new light on some of the key historiographical controversies regarding the BEF’s performance. Furthermore, from these issues it is evident that the subject of communications also has implications with regards to much broader academic controversies regarding the role of technology in warfare. In particular, an examination of communications draws attention to the current RMA debate. Over the last three decades, dramatic advances in communications and information processing technology have led a number of commentators to speculate that the armed forces of several Western states are in the midst of an information-based RMA. Historians have sought subsequently not only to uncover past examples of RMAs but also to assess the extent to which these RMAs depended upon their communications components. As yet, however, there has been no detailed and systematic exploration of the role of communications and information in the BEF during the First World War, the conflict which, according to some historians, spawned the most important RMA to date. This study has the opportunity, then, to position the subject of communications within the wider context of the literature on the First World War RMA, asking


80 An RMA here is defined as ‘a major change in the nature of warfare brought about by the innovative application of new technologies which, combined with dramatic changes in military doctrine and operational and organisational concepts, fundamentally alters the character and conduct of military operations’. See Thierry Gongora and Harald von Rickhoff, ‘Introduction: Sizing up the Revolution in Military Affairs’, Gongora and von Rickhoff (eds.), Towards a Revolution in Military Affairs? Defence and Security at the Dawn of the Twenty-First Century (Westport, CT: Greenwood Press, 2000), 1.


83 Bailey, First World War and the Birth of the Modern Style of Warfare; and, Gray, Strategy for Chaos, 170–221.
to what extent the role and impact of communications and information contributed to the emergence of the ‘modern battlefield’ in 1918.

This book is based primarily upon the examination of unpublished archival material from across the English-speaking world, particularly the contemporary memoranda, operation orders and post-battle reports contained within the appendices of the unit war diaries held at the National Archives of the United Kingdom.\(^84\) Significant use is especially made of the GHQ, army, corps and divisional signal company war diaries, which have so far remained largely untouched by historians. Although they are generally more reliable than the post-war official history correspondence,\(^85\) the war diaries need to be dealt with carefully. They vary in terms of detail and quality, from the meticulous and concise to the illegible and very poor. Nevertheless, the collective wealth of information contained within them provides an unparalleled glimpse into the realities of command, control and communications on the Western Front. Moreover, as Peter Simkins argues, they demonstrate that ‘a continuous process of tactical evaluation, operational analysis and often robust criticism was taking place at all levels of command in the BEF’.\(^86\)

Also invaluable are the training manuals issued by GHQ and printed by the Army Printing and Stationary Service of the BEF during the war.\(^87\) Based on the lessons learnt from battlefield experiences, these manuals were issued by GHQ to the rest of the army as a means of instilling a common set of tactical principles, though they were not prescriptive orders as such. More than 650 training manuals were printed during the course of the war on a variety of subjects, including communications.\(^88\) Since many of the manuals were revised and updated, they provide revealing insights into what GHQ considered ‘best practice’ at
the time they were written, and the extent to which the BEF formulated a ‘communications doctrine’ during the war.

In addition to the war diaries and training manuals, the unpublished letters, diaries and papers of a number of British officers, such as those held, for example, at the Imperial War Museum, London, Liddell Hart Centre for Military Archives, King’s College London, and the Churchill Archives Centre, Cambridge, have also been consulted. The problem for this particular study, however, is that only one of the most senior officers of the Signal Service left any personal papers, correspondence or diaries relating to his wartime experiences.\textsuperscript{89} To compensate for this deficiency, not only have the private papers belonging to junior officers, NCOs and other ranks of the Signal Service been utilized, but also the private papers of a substantial number of officers, who were not attached to the Signal Service, have been examined extensively in the search for information pertaining to communications. These sources are supplemented by the material contained in the under-utilized collections of the BT, Royal Mail, Royal Engineers and Royal Signals archives, which have yielded crucial information pertaining to the BEF’s communications organisation, personnel and practices.

Finally, although the research for this book has been based upon a comprehensive study of material from government archives and private collections within the United Kingdom, because of the erratic preservation of documents relating to the BEF’s communications system in British archives, there are notable gaps in the records. In an effort to overcome this dilemma, the files of the Australian and Canadian Corps, and the American Expeditionary Force (AEF), located, respectively, in the Australian War Memorial, Library and Archives Canada and the National Archives and Records Administration, have been consulted. The AEF files (Record Group 120), in particular, contain detailed reports and correspondence related to the inner workings of the BEF’s communications system, which American officers studied and copied to good effect in 1917–18. Since this material has not survived in the British archives, it has made a useful addition to the primary material used in this study.

In order to provide a thorough examination of the BEF’s communications system and help establish what influence communications had on British operations, this study has adopted both a thematic and a chronological approach, consisting of seven chapters. Chapters 1–3 will examine

\textsuperscript{89} This was Brigadier-General Arthur Hildebrand (Deputy Director Signals, Second Army), whose personal diary of the 1914 campaign on the Western Front was published as: ‘Second Army Signals, 1914: From the Personal Diary of Brigadier-General A. B. R. Hildebrand’, \textit{Royal Signals Quarterly Journal}, 6 (1938), 129–41.
the general components – organizational, personnel and technological – that constituted the British Army’s communications system. Combined, these thematic chapters explain how the BEF’s communications system functioned and how it evolved during the course of the war. They also provide the necessary foundations from which an investigative analysis of the performance of the BEF’s communications system can then be made. Chapters 4–7 assess more specifically how this communications system influenced the nature and conduct of British operations between 1914 and 1918. The Conclusion then draws together the book’s main findings, revealing the true extent to which communications shaped the BEF’s operations and, more broadly, what this tells us about the BEF as an institution.