EMERs — A Valuable Resource

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Revised and reset using LaTeX– October 2009

Abstract

If you're restoring a British WS19 Mk2 and are stuck for a part, you need to look at EMER Tels F254/2. But what do you know about the EMERs and their numbering system? Read on!

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The Royal Electrical and Mechanical Engineers

The Great War was a turning point in many ways, of course, but in technology it represented the first mass use of warlike technologies other than ordnance. As we all know, whatever man makes is sure to break down and in the hostile environment of the battlefield, this is particularly true. So it has always been necessary to have experts to fix things when they go wrong, and by the end of the Great War, there were four sets of experts; Tank Corps to fix tanks, Army Service Corps to fix other vehicles, Royal Engineers for anything in the areas of construction, surveying, demolition and telecommunications, and the Army Ordnance Corps for nearly everything else, including ordnance, obviously. In addition, most fighting units had their own experts to carry out minor repairs in the field.

It rapidly became clear that this was not an efficient arrangement, both in duplication of resources and in the administrative difficulty of getting repairs done in a hurry by several different sets of experts. Between the wars, many attempts to rationalise the situation were made, but were unsuccessful for a number of reasons including:

- The initial expense of making the change.
- Esprit de corps.
- The aversion of existing formations to losing a degree of self-reliance.
- The relatively small size of the inter-war army, which would have tended to dilute any increase in efficiency.

In 1926 however, a start was made. The (by then) Royal Army Ordnance Corps took over repair of AFVs (Armoured Fighting Vehicles) and some other transport but the Royal Engineers, Royal Signals and Royal Army Service Corps continued to look after their own equipment and other formations still provided personnel for immediate repair work.

The outbreak of World War 2 brought tremendous increases in the numbers and complexity of technological systems in use and again highlighted the inefficiencies in repair processes. Following a Cabinet committee investigation into the use of manpower in the three services, in October 1942, the Royal Electrical and Mechanical Engineers corps was formed. Clearly to attempt this sort of reorganisation in time of war was a major undertaking but it may have been prompted by the fact

that the core of the professional British Army had lost the majority of its heavy equipment during the withdrawal from Dunkirk and some units were possibly ripe for reorganisation. The author was recently struck by the words of a survivor that he saw "huge mobile workshops, beautiful things" being destroyed that they might not be of use to the Germans.

It was decided that REME's formation would be carried out in two phases, the first of which would leave regimental fitters and driver/mechanics within their regiments, leave RE responsible for its specialist equipment and leave RASC Transport Company workshops in place. Phase two, to complete the reorganisation, would be delayed until more favourable conditions existed. In the event, this was not completed for another 26 years, in 1968!

The Electrical and Mechanical Engineering Regulations

Until the formation of REME, information on equipment appears to have been issued to interested parties in the form of "pamphlets". These had long been a feature of Army life and covered every conceivable facet of that life, primarily as training and reference aids. In the case of communications equipment, the practice was to produce a selection of different pamphlets, which tended to vary between equipment. For example, a total of sixteen different publications are known for Wireless Set No 1 in the period from its issue in 1933 to the beginning of the Second World War, not including re-issues and Signals Experimental Establishment reports.

The SEE and its successor the Signals Research and Development Establishment (SRDE) played an important role in the development of Army wireless equipment, overseeing projects from the design stage right through to issue. Because of this, they were the obvious source for much of the technical (ie non-operational) information on the equipment. From the formation of the REME however, a new form of document appeared, presumably borne out of a desire to rationalise the documentation into a standard form which would be used throughout the new organisation. This was the Electrical and Mechanical Engineering Regulation, the EMER, which covered, in a standardised way, all aspects of the equipment's maintenance.

EMER Numbering

The EMER number consists of five parts, and as an illustration, I'll use the EMER for Unit Repairs on the Wireless Set No19 Mk 2 (British):

Tels F253/2

made up of these components:

Tels	EMER Group – Telecommunications
F	Section – Radio Stations
25	Equipment Designation – WS19 *note that there is no connection between this number and equipment numbering. 25 does not indicate a WS25!*
3	Part Number – Unit Repairs
/2	Indicates Mark 2 (this code is only applies when marks higher than 1 exist and was dropped later in favour of using different designation codes for different marks)

EMER Group

The complete set of EMERs is divided into a number of general areas, called Groups, indicating the nature of the equipment. Originally there were twelve groups:

Group	Abbreviation
Armament	A
General	G
Instruments & Searchlights	I
Miscellaneous	M
Power	P
Recovery	R
Small Arms & Machine Guns	S
Telecommunications	T
Tracked Vehicles	VT
Wheeled Vehicles	VW
Vehicles General	VG
Workshops	W

The author has never seen a reference to any of these original abbreviations and it seems that they were found less than easy to use. The subject areas were also found to be too broad and additional groups were added, to eventually total nineteen. This appears to have been an extended process and it is possible to infer when groups were added, by observing instructions to transfer existing EMERs to new groups.

Group	Abbreviation	Date ?
Aerial Delivery Systems	AD	?
Aircraft	AC	?
Armament	ARMT	Original
Engineering & Miscellaneous	ENG & MISC	Original
General	GEN	Original
Guided Weapons	GW	?
Instruments	INST	1960
Management	MGMT	March 1971
Medical & Dental	MED & DENT	August 1971
Power	PWR	Original
Radar & FCE	RAD & FCE	October 1954
Range Equipment	RANGE	?
Small Arms	S ARM	September 1972
Test & Measurement	T & M	September 1972
Telecommunications	TELS	Original
Tracked Vehicles	TKD VEH	Original
Wheeled Vehicles	WH VEH	Original
Workshops	WKSP	Original

For those interested in wireless equipment, the rest of this article will ignore all groups except Tels, Comms Inst and Pwr. although it must be remembered that, large thought these parts are, they are outdone by groups such as Armt and the two Veh groups.

EMER Section

Within each group, EMERs are divided up into (up to) twenty six sections, each given a designation letter from A to Z. In each case, the A section contains general information about the EMERs in the group. including (sometimes) an index to the whole group. The author has never seen an index to the Tels, Comms Inst or Pwr groups, unfortunately. In any case, as will be discussed below, the contents of EMER groups were dynamic and an index would only be accurate for a short period of time.

During and immediately after WW2, there was a complete set of sections in the Tels group:

Tels Section	**Subject**
A	General Reference
B	Instrumentation, Beacons and Detectors
C	Audio
D	Wireless Transmitters
E	Wireless Receivers
F	Wireless Stations (i.e. transmitter + receiver)
G	Stations, Radio (Larkspur era)
H	Stations, Radio (Larkspur era)
I	Wireless Transmitters, medium and high power (Larkspur era)
J	Components, Relays and General
K	Power Supplies and Other Sub-systems
L	Vehicle Systems and Other Sub-systems
M	Test Kits
N	Medical
O	Radar
P	Radar
Q	Line Equipment
R	FDM Telephone and Telegraph
S	Telegraphy
T	Telephony
U	Telephony
V	Radiac
W	Test Gear*
X	Test Gear*
Y	Test Gear*
Z	Test Gear*

** This is specifically Telecomms test gear — general test gear has its own T&M group (see above).*

One final complication in the section code is that you will often see a second letter, for example FZ 256/3 which is the Identification List for the Canadian WS19 Mk 3. The second letter, when present, indicates the country of origin, other than the UK, of the equipment. Only two country codes are known :

Y United States
Z Canada

EMER Part

Each EMER is divided into up to ten parts:

0. Data Summary
1. Operating Instructions
2. Technical Description which, for complex equipment, may be subdivided:
    1. Technical Description
    2. Fault Finding & Repair Data
3. Unit Repairs
4. Field & Base Repairs, sometimes subdivided:
    1. Field Repairs
    2. Base Repairs
5. Preparation for Special Function (e.g. waterproofing)
6. Maintenance Schedules and CENTREMS Lists[1]
7. Modification Instructions
8. Inspection Standards
9. Miscellaneous Instructions

Not all EMERs have all the parts and the author has never seen an example of parts 5. There are also a number of complications with the part names, quite aside from the issues of renumbering dealt with below.

Originally, there were four "levels" of repair commonly referred to as "Unit", "Field", "Intermediate" and "Base" but referred to as 1st, 2nd, 3rd and 4th Echelon Repairs. The higher the number, the more complex the repair. Thus unit repairs would be carried out in situ, field repairs at a local workshop or LAD (REME Light Aid Detachment) and base repairs would mean sending the kit back for repair. However, these divisions were very flexibly applied, so parts 3 and 4 are usually found together. Wartime EMERs usually refer to the echelon numbers, later EMERs to the common names.

As noted above, EMERs in the A section contain general descriptive and reference material. These documents do not follow the 0 to 9 part numbering convention.

Equipment Designation

The allocation of equipment designations cannot be considered simple. The only general principle which is discernable is that EMERs carry a number which, initially, seems to have been allocated approximately sequentially according to the type of equipment, starting with those in service in 1942. Thus the EMERs for WS1, WS2, etc. are at the start of the list, despite apparently having been issued much later.

EMERs Today

EMERS turn up relatively frequently on eBay and at rallies, etc. - occasionally in large quantities. They will usually be found in two states; in large loose leaf binders (blue for Restricted and red for Confidential or Secret) or as collections of loose sheets, 8.5 x 11 inches or A4 (after 1970, approximately). You will often see a piece of insulating tape at an angle across the spine of the folders - this was a trick

[1] CENTral REpair iteMS. Those items which, because of complexity or the cost of repair equipment, must be returned to a central repair facility.

to make spotting missing volumes easier. A tape was laid diagonally across all the binders on a shelf and cut between the binders. Thus a missing binder would show up as a jump in the diagonal line.

It seems certain that many REME workshops closed in the 60s and 70s, and their EMER collections found their way onto the open market, rather than being destroyed as was presumably the order from higher authority. In some cases this is surprising, given the currency of the contents. However, the author has never seen a red binder on eBay!

You will often see individual EMERs, or individual sets of pages for a particular equipment and these were issued to "end use" units because they had to be aware of modifications and miscellaneous instructions, as well as unit level repairs. However, buying such collections of sheets is a very chancy business. The contents of any EMER must be looked on as dynamic because changes and re-issues were happening all the time. Thus it is next to impossible to be sure what ought to be in an EMER advertised on eBay or even at a rally, when you can look through it. The author has had bitter experience of this problem, having bought, at some expense, the Part 2 EMER (Technical Description) on the Wireless Set No 10, complete with Secret markings. Unfortunately, it turned out to contain approximately half of the pages listed in the index, rendering it fairly useless!

Very occasionally you may be lucky enough to spot a black binder approximately 9" x 6" marked "E.M.E.R. GENERAL A 060/1)". These are collections of Part 0 EMERs issued to staff officers as reference material for use in planning and come in two versions, one marked "Signal Equipment Data" (for R Signals officers) and the other marked "Equipment Data Summaries". Inside you will find a fascinating assembly of the data summaries of all equipment current at the time the binder was scrapped and these binders are the reason why nearly all Part 0 EMERs are printed on 8.5 x 5 inch art paper.

Reissues, Renumbers, Dates and Conflicts

This article has been prepared from three sources, the EMERs listed in Wireless for the Warrior Volumes 1 to 4, the EMER listings on the web site of the REME Museum,

http://www.rememuseum.org.uk/electron/index.htm

and EMERs made available to the http://www.royalsignals.org.uk/ web site.

All the information presented so far is to a degree "sanitised", because in practice, as might be expected, the evidence is not entirely without internal conflict, for a number of reasons. There seems to have been, right from the start, a tendency to re-issue EMERs, with or without different numbers. A prime example of this concerns the use of the optional code at the end of the number to indicate different marks of the same equipment. You will recall that F25x/2 covers the WS19 Mk 2 and similarly F25x covers the Mk 1 and F25x/3 covers the Mk 3. Later, this practice seems to have gone out of favour in some cases and by 1944 F25x/2 had been renumbered as F26x and F25x/3 as F27x, but not all equipment was treated this way at the time! However, there seems to have been a major renumbering exercise in June/July 1955, after which the optional code is not seen.

As equipment went out of service, the EMERs covering it were withdrawn and destruction of the documents by units holding them was ordered. At some later time, these "released" numbers would in many cases be reused for new equipment, as seems to have been the case with EMER Tels E78x which, from 1944 covered the R1294 and from 1956 covered the UK/TRR-328. Notice that the E section code continued to designate receivers.

Although it is possible in many cases to infer the chronology for re-issues, this is by no means always possible. It must be remembered that EMERs were held in loose leaf binders (unlike the equivalent American TM series) and that whole and part EMERS were re-issued as errors were spotted and changes required. In the case of the reissue of a few pages, this is easy to spot as the replaced pages are marked with an issue number and a date. However, when a whole section was re-issued, the document date changes and, in theory, the original issue date might be lost.

So, in reading the lists of EMERs which appear below, note that in some cases the month and year of issue is given (mostly from inspection and from the REME site lists) and in others it was necessary to rely on the issue year of the equipment. Clearly this is not entirely satisfactory and leads to conflicts. However, since the whole purpose of the lists is to identify EMERs from equipment designations and *vice versa* this is not necessarily significant.

List of EMERs by Equipment
List of EMERs by Number

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Glasgow November 2009