

Triffid in BAOR

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Summary Early in 1980 Triffid (UK-TRC471) began to replace the previous generation of radio relay equipment in Royal Signals units in BAOR. The article outlines the conversion training arranged for regimental personnel and details the user's early assessment of the new

equipment and its advantages, including excellent system-engineering facilities (permitting a greater degree of decentralization of control) flexibility of the engineering order wire system, improved channel capacity and increased path-loss capability.

Lieutenant-Colonel Story

Lieutenant-Colonel Story was commissioned from Sandhurst into the Royal Corps of Signals in 1958. He subsequently graduated in engineering at Cambridge and, later, was awarded a further degree at Birmingham University for a thesis on computer programming. His academic qualifications have been complemented by experience in a wide variety of communications and data processing appointments both in Europe and overseas. He is now in the Ministry of Defence, engaged in planning the introduction into service of Ptarmigan, the Army's new tactical trunk communication system - for which Triffid will provide the principal radio bearers.

Major Boulter

Major Boulter enlisted in the Royal Corps of Signals in 1953. After initial training as a line technician he made extremely rapid progress, qualifying as Foreman of Signals in 1956, and was commissioned in 1967 as a Technical Officer, Telecommunications. His career has afforded him extensive experience of the various facets of military communications. He has served in 7th Signal Regiment since 1975. As Technical Adjutant of the Regiment he has been closely concerned with measures to enhance the performance and extend the life of the existing trunk system within 1st (British) Corps.



Introduction

A comprehensive description of the Triffid radio relay (UK-TRC471) appeared in the Summer 1978 (Vol. 4 No. 3) edition of this journal. The article also mentioned the very favourable British Army reaction to results achieved during the user trials which were then in progress. General issue of the equipment began with BAOR, and 7th Signal Regiment was the first field unit to operate Triffid, taking delivery

of their first six detachments on 22nd December 1979. Lieutenant-Colonel Story was the Commanding Officer of 7th Signal Regiment at that time and Major Boulter was his Technical Adjutant. The present article, recording their initial reaction to the new radio relay equipment, was originally published in the Journal of the Royal Signals Institution in the summer of 1980.

Training

In order to field the new Triffids as quickly as possible 7th Signal Regiment was tasked to collect the first six production models from Central Ordnance Depot (COD) Donnington and to carry out initial operator training for 1st (British) Corps units. The problem of who trains the trainers was solved when two non-commissioned officers, Sergeant Beattie and Corporal Ludlam from the Trials Squadron at the School of Signals were diverted here, bringing with them a User Trials Report and Operator's Handbook. Within three weeks of the arrival of Triffid in British Army of the Rhine (BAOR) the equipments had been rigorously tested and the regiment's Training Wing had published an operator's pamphlet.

The first course to be run was for the instructors who came on loan from various 1 (BR) Corps units. Following this course the Training Wing was ready to train the 108 combat radiomen, 54 systems managers and 54 technicians who were needed for the first phase of Triffid deployment in 1 (BR) Corps.

This training went well; combat radiomen conversion courses were of one week's duration, system managers had a one day course and technicians attended for two days which taught them simple fault finding and repair by board replacement. The training was completed by May 1980 and all the 31 Triffid detachments in 1 (BR) Corps units are shortly to deploy on Exercise SILVER SPEAR using Triffid as the main radio relay bearer.

System engineering

Without exception the instructors and students had nothing but praise for Triffid. It was not just that the equipment was new but that its facilities, especially the System Module mimic display panel and built-in test equipment (BITE), offer significant improvements in system engineering. With these improvements and without the aid of BID loops, good operators

with well-sited detachments are able to establish a radio relay link or chain without constant control and supervision from either Communication Centre (COMMCEN) Commands or Technical Controls. This devolution of responsibility in radio relay engineering significantly increases job satisfaction for combat radiomen and relieves the pressure on centralized controllers. However instances could occur (none have in our limited experience) when full direction and control will have to be exercised from the COMMCEN Command or Technical Control associated with the senior call sign as was the practice when establishing Station, Radio (SR) C50 and C70 links; however such instances should be limited to occasions when a combination of either bad siting, bad paths, frequency interference or un-serviceable or suspect equipment occur.

To replace the 'November Mike' codes used with the SR C50 and C70 for link engineering, the regiment devised a Triffid engineering chart which it is hoped will become the standard for the Corps. The chart has been used successfully throughout the training and has proved itself on many exercises. The chart is included in the operator's pamphlet.

Editor's Note: The readers to whom this article was originally addressed could be assumed to understand the configuration of the pre-Triffid system and the engineering techniques applied to it. In the context of the foregoing section the salient feature of that system is that proving the quality of a radio path (or chain of paths) for traffic requires at least one multiplexer - which is often not available at a sufficiently early stage. The resultant delay in establishing circuits can only be minimized by the use of complex, and very formalized, engineering procedures with an undesirably high level of centralized control.

'BID loops' are connections to turn the multiplexed bit-stream back towards the originating multiplexer, applied at progressively distant points in the chain.

The equipment

The Triffid detachments come complete with new generators, masts and ancillary equipment. The Band 3 (1.35-1.85GHz) RF Head and antenna



Fig. 1. The antennas (band 2 antenna is shown) are easily removed from the storage bin.

have not yet been issued but the Band 1 (225-400MHz) and Band 2 (610-960MHz) R.F Heads permit direct substitution for SR C50 and C70 detachments. On several exercises marginal SR C50 and C70 links have been replaced by a Triffid radio relay bearer.

The results have been dramatic; links that were marginal became trouble free.

The main advantages of Triffid compared to the SR C50 and C70 are:

1) It has excellent system engineering facilities; in particular the System



Fig. 2. The r.f meter, handset and ancillaries enable an operator simultaneously to talk to and do antenna swings with the distant station.



Fig. 3. The remote alarm box enables one operator to supervise more than one detachment.

Module mimic display and the facility to send and receive (and check for errors) an artificial test pattern at either 250 or 500kbit/s.

2) Tests required during engineering can be set up in seconds using switches; no longer do cables have to be continually connected and disconnected.

3) Antennas on both Bands 1 and 2 can be set either to vertical or horizontal polarization, a facility not available to the SR C50.

4) Omnibus engineering is available between all radio relay call signs.

5) The operators can talk to the next call sign in the chain from outside the

vehicle when carrying out swings and height gain tests; this saves considerable time in establishing a good radio path.

6) A 'no break' power facility is provided; float-charged batteries provide power to the Triffid stacks and, in the event of the generators failing, still allow a detachment to work up to five hours (dependent primarily on the number of stacks in use).

7) Both Band 1 and 2 are capable of 6 or 12 channel working; previously a 12 channel system could only be provided using the SR C70.

8) The maximum permissible path loss is of the order of 3 to 6dB better

than the SR C50 and C70, dependant on frequency and mode of operation (i.e 6 or 12 channel working).

The installations are not, regrettably, without some disadvantages. The two main ones are:

1) The off-board power cannot be used probably due to a design fault which causes a danger to life; the problem is under investigation by REME and modification to the installation will result.

2) The top of the vehicle-mounted mast is 3.9 metres above ground level. This can be a hazard during movement although careful recce can overcome this. In 7th Signal Regiment's barracks the vehicle-mounted mast has to be removed before the vehicle can drive into the Light Aid Detachment (LAD) or garages!

Conclusion

Triffid is not just a new equipment but one that has many new and advanced engineering facilities. It represents a significant improvement over the existing SR C50 and C70s and has come just in time to provide that solid radio relay backbone required for Bruin to extend into the mid 1980s. John Wyndham's 'Day of the Triffids' has arrived but to 1 (BR) Corps it is very welcome.

Acknowledgement

This article was first published in the Summer 1980 (XIV/5) issue of the Journal of the Royal Signals Institution and we are grateful to the editor and authors for kindly giving permission to reprint the article in this journal.

RÉSUMÉ

Au début de 1980 le Triffid (UK-TRC471) a commencé à remplacer l'ancienne génération des stations-relais utilisées par les unités du Corps des transmissions des Forces Armées britanniques sur le Rhin. L'article décrit le programme de formation du personnel militaire à cette conversion ainsi que les réactions initiales de l'utilisateur devant le nouvel équipement dont il énumère les avantages: degré d'excellence technique du système (qui permet une décentralisation plus grande des commandes), souplesse du système à circuits de service, la capacité accrue en voies de canaux radioélectriques et les possibilités améliorées au niveau de l'affaiblissement sur le trajet.

ZUSAMMENFASSUNG

Anfang 1980 wurde damit begonnen, die vorhergehende Generation der Rundfunk-Relaisausrüstung in Royal Signals-Einheiten der britischen Rheinarmee durch die Triffid-Serie (UK-TRC471) zu ersetzen. Der Artikel umschreibt das dem Regimentspersonal gebotene Umschulungstraining und liefert eine anfängliche Bewertung der neuen Ausrüstung und ihrer Vorteile durch den Benutzer einschließlich ausgezeichneter Möglichkeiten der Systemtechnik (was eine größere Dezentralisierung der Bedienung ermöglicht), eines flexiblen technischen Dienstleitungssystems, erhöhte Kanalleistung und verbesserte Streckendämpfungsmöglichkeiten.

RESUMEN

A principios de 1980 Triffid (UK-TRC471) empezó a reemplazar la previa generación de radioestación relé en las unidades del Royal Signals en el BAOR (Ejército Británico emplazado en Alemania). El artículo resume el entrenamiento de conversión dispuesto para el personal del regimiento, y detalla el primer avalúo del usuario del nuevo equipo y sus ventajas, incluyendo las excelentes instalaciones y servicios técnicos del sistema (que permite un grado mayor de descentralización de control) flexibilidad del sistema alámbrico del orden técnico, capacidad perfeccionada de los canales y la creciente posibilidad de mejorar el nivel de disminución del recorrido.