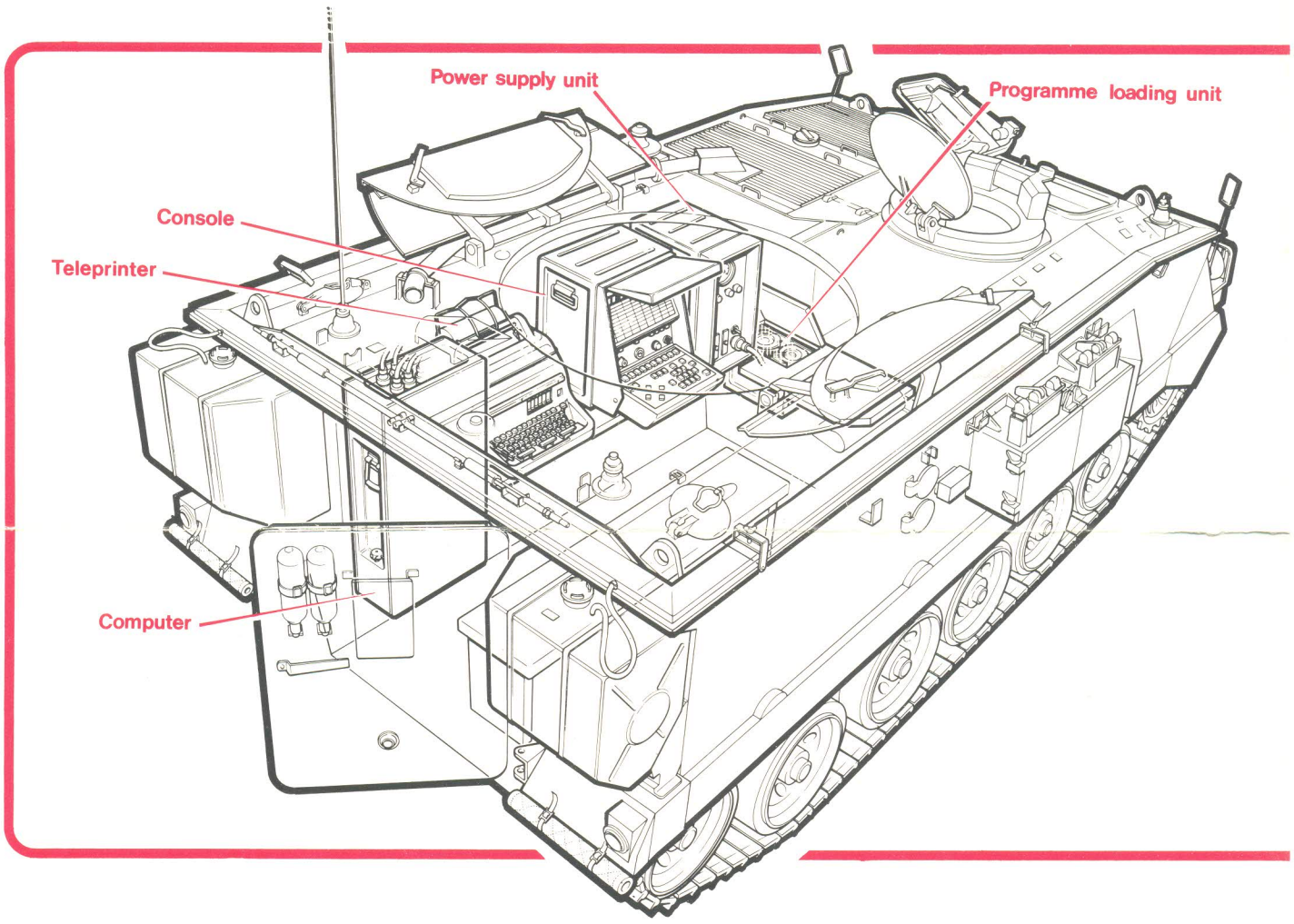
FACE

FIELD ARTILLERY COMPUTER EQUIPMENT

Adopted by the British Army

F.A.C.E. represents the first step in introducing the power and flexibility of digital computers into the Field Army in a form sufficiently small and rugged for use in battle.
Its task is to automate the complex procedures associated with the preparation of gun-firing data for Field Artillery.



The Problem

To find the best way of using modern technology to improve the effectiveness of Artillery striking power. Four factors make this necessary:

Current methods entail many separate steps of calculation, all potential sources of human error. They thus require highly trained teams for efficient operation.

Performance of a team deteriorates under battle conditions.

Speed of gun-order computation is too slow for the fast-moving battles of today, particularly where large-calibre weapons are used.

Accuracy is affected by adverse weather conditions.

The Solution

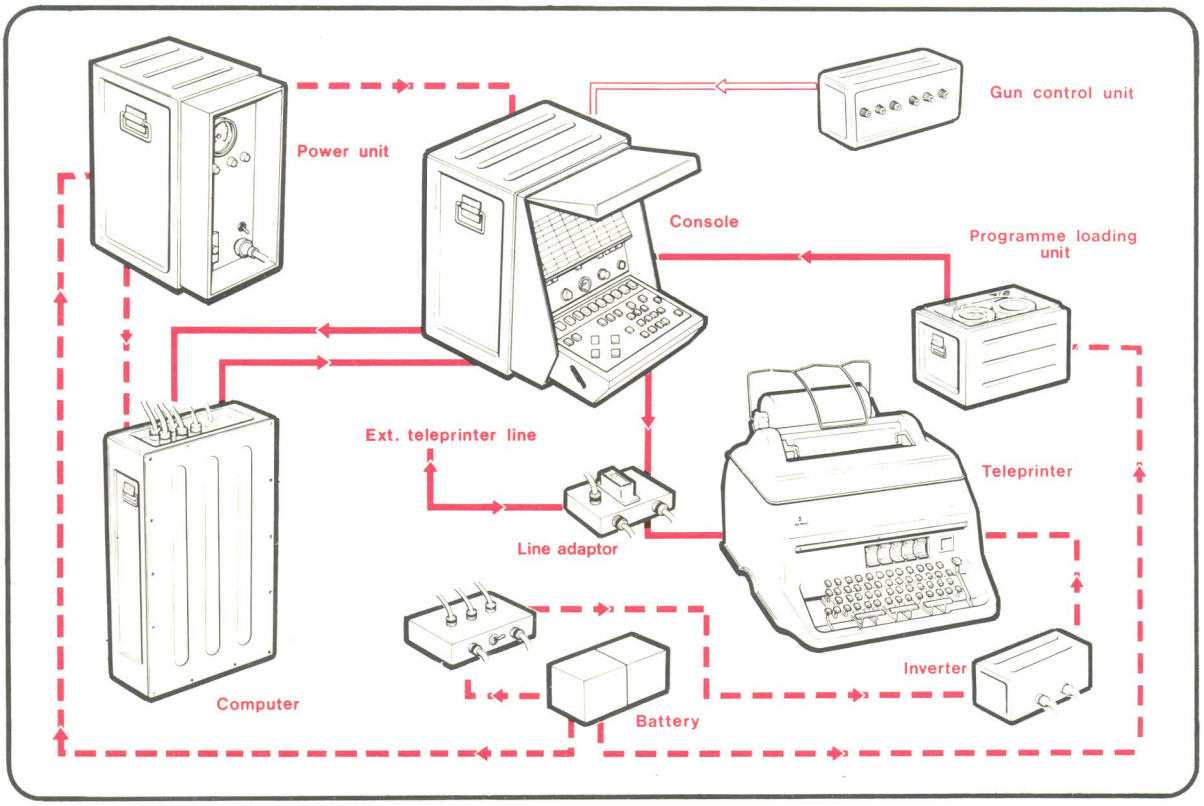
A small digital computer, specially designed to be battle-worthy, is used to execute all the calculations, thereby ensuring improved accuracy and consistent performance.
A specially developed control console is used to connect man and machine, and allow simple and reliable entry of target, weapon, meteorological and other data.

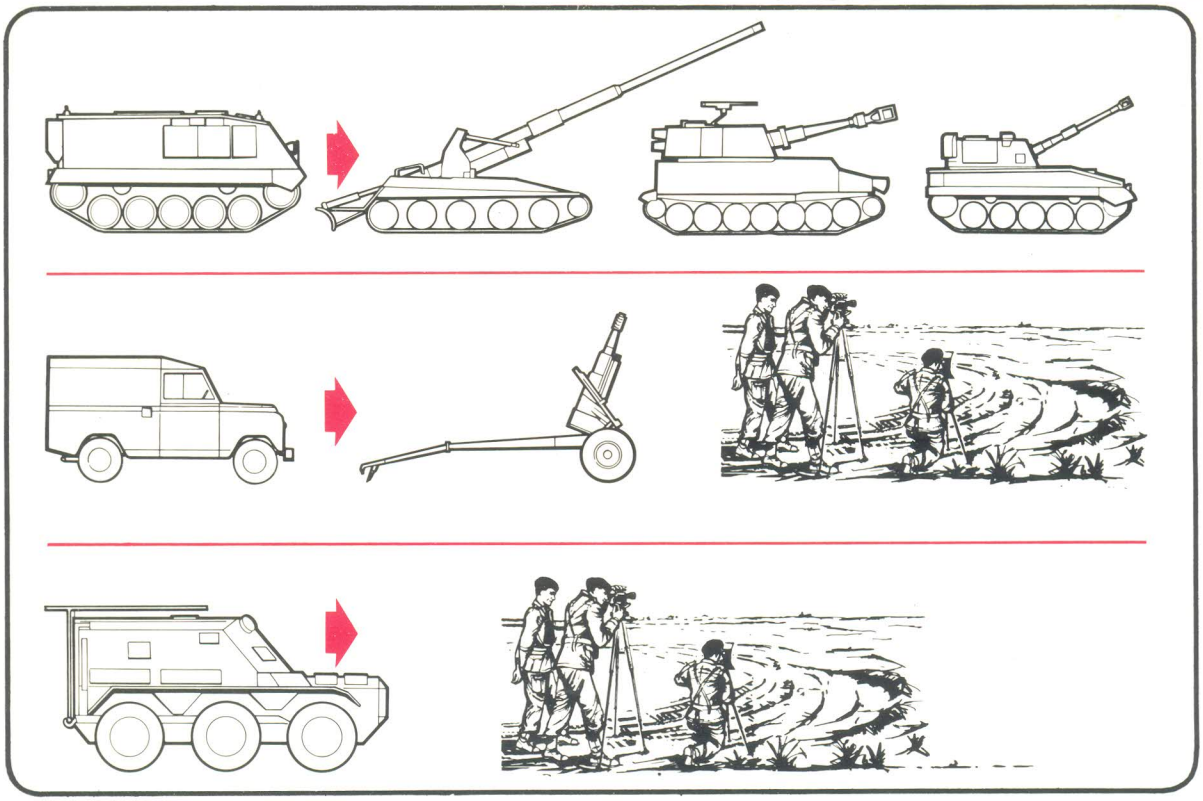
Clear and rapid presentation of results improves reaction time, and increases effectiveness.

The inherent flexibility of the system will promote continuing improvement in procedures, and the use of more sophisticated computation—both of these becoming necessary when further military developments result in better meteorological reports and automated data flow.

System

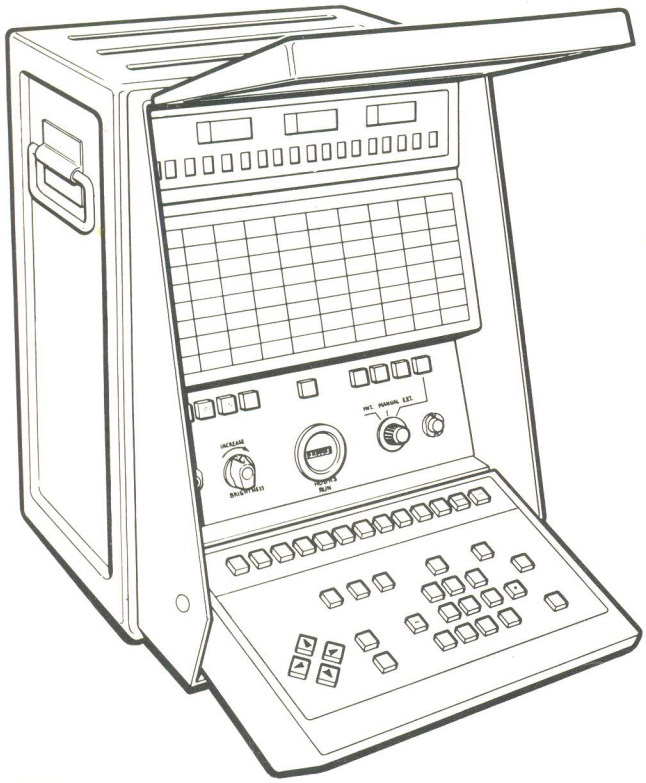
The system is based on the successful Elliott MCS 920B second-generation digital computer, and uses a specially designed Control Console for injecting target, meteorological and other necessary information, as well as displaying the gun orders. The system is operated from a d.c. supply of 28 volts and has a total consumption of 300 watts. Each item of the system has an integral harness to allow mounting in an armoured vehicle or Land Rover.





Flexibility

The system can be used not only for generating gun orders for many different weapons, but also for carrying out all the Survey calculations necessary for their initial accurate positioning. In the Survey role more than 30 problems are stored each comprising a routine for input, the calculation, and an output routine for presenting the answer on the teleprinter. The calculations are carried out to an even greater accuracy than is possible using seven figure logarithms—this in less than 10 seconds.



The project was originated with a War Office contract to build a special Artillery Control Console for use with the Elliott 803 Computer. This was used for School of Artillery trials to ascertain whether computer methods were suitable for the generation of gun orders.
The layout of the console, the exact facilities to be provided, and the man/machine relationship, were important areas to be defined, and this could not have been achieved without the close liaison that exists between the Royal Armament Research and Development Establishment, the School of Artillery and Elliott-Automation.

Specification

Elliott MCS 920B Computer

Word length	18 bits
Program levels	4
Interrupt priority levels	3
Speeds: Add/Substract	23μ secs
Multiply/Divide	78μ secs
Store size	8192 words (extendible to 65536 words if req'd.)
Power Consumption	80 watts
Volume	less than 3 cu.ft.
Weight	90 lbs.

Console

Power Consumption	100 watts	
Dimensions	Width	20½ ins.
	Height	23 ins.
	Depth	17 ins.
Weight	80 lbs.	

Teleprinter

Type	Siemens	T 100 R.
Dimensions	Width	15½ ins.
	Height	14 ins.
	Depth	21 ins.
Power Consumption	3-70 watts	
Weight	56 lbs.	

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