

## **Grand Challenge**

### **Rules for the Finale**

#### **Introduction**

1. This document sets out the rules under which the Finale will be conducted, marked and judged. It is intended for wide distribution to all teams.
2. The rules have been developed to allow a wide a range of possible solutions. Rules have been cast in the standard form:
  - *Shall* – these rules must be obeyed by all teams and non-compliance is grounds for exclusion from the Grand Challenge.
  - *Should* – These rules should be complied with where possible. Where they are not complied with, in full or part, they will attract adverse marking or assessment.
3. This document describes:
  - Rules for Pre-Qualification and Finale
  - Rules for the Finale and marking scheme.
4. The Grand Challenge will be assessed by a panel of independent judges who are responsible for defining the rules of the Grand Challenge, their interpretation and any associated marking or assessment. The Chief Judge chairs the panel.
5. These Rules will be under constant review to ensure maximum benefit is gained by all teams and the MoD. To meet this requirement the Chief Judge may authorise changes to the Rules. Rules may be changed for a number of reasons, such as to accommodate a promising, innovative technology. Teams may request such changes through the Chief Judge. The decision of the Chief Judge is final.

#### **Pre-Qualification**

6. All Teams shall submit the proposed system for examination by the Project Team with a view to approval of the system for participation in the Finale at Copehill Down.
7. This examination will focus on Health & Safety to determine the suitability of the system for the Finale. This examination will be one calendar month before the Finale begins. A timetable to rectify any issues identified will be agreed at this point before a final examination is carried out. Any issues that are not rectified to the satisfaction of the MoD Project Team by the first day of the Final Event will result in exclusion from participation on the grounds of Health & Safety.

#### **Finale Rules**

8. Three months prior to the Finale, contestants shall provide the MoD Project Manager with a list of staff requiring access to the Finale and any special access or support requirements. The overall administration of the Finale is the responsibility MoD Project Manager. A Support contractor will be appointed to assist with the delivery of the Event.

9. The order in which the teams demonstrate their systems will be determined by ballot. The Finale will take place over a three week period in August 2008 at Copehill Down Village, Salisbury Plain. Planning and organisation of the Finale is in progress. Details will be passed to teams nearer the time.

10. System Definition - The term *system* means the equipment and associated operators necessary for the team to demonstrate their capability.

11. The Finale will comprise two phases of operations. These are as follows:

- Proving Event Three mini-tasks are to be completed:
  1. A simple navigation and containment task.
  2. A short threat identification task.
  3. A threat identification task with a number of threats to be identified.
- Final A reconnaissance of an urban area in order to identify a number of potential targets.

12. An overview of the target types is given in annex A. A brief description of the location and area to be used is provided in Annex B. Annex C contains the marking criteria.

- One month prior to the Finale entrants will be provided with a data pack containing details of :
  - Administration and Team Pits Area
  - Forward Operating Base
  - Reconnaissance Area – including any particular areas of interest or previous identified tactical information – it is likely that the reconnaissance area will be sub-divided into prioritised sectors.
  - Area within which all components of the system shall remain

13. The team systems and their associated personnel are to report to Copehill Down where they will be directed to the Administration and Team Pits area. Teams will be located here until required to participate in the Finale. The systems should be capable of operating in an environment typically found on the Salisbury Plain Training Area during summer. System operators or any staff from the teams shall not enter the area to be reconnoitred except with the explicit permission of the MoD Project Manager and any associated range control staff.

14. The system shall be capable of being operated during the Final by a maximum two people from the Forward Operating Base.

15. For the Proving Event there will be up to 3 operating points within the Copehill Down Village. Details of the the mini-tasks will be provided with the Finale briefing pack.

16. Once the system and its operator have deployed to the Forward Operating Base the operators will receive a final brief on the Finale task. This will comprise of a scripted verbal brief supported by appropriate hardcopy schematics. A military member of the Judges Panel will represent the Tactical Commander for the Finale and will be with the team whilst they are operating their system. The Tactical Commander will be the recipient of information generated by the system during the Finale. The system should provide information in a timely and readily accessible fashion.

17. The time taken between receiving the brief and commencing the reconnaissance shall be less than 30 minutes.

18. The reconnaissance task shall take no more than 1 hour. At the end of one hour, teams will have 30 minutes to clear the operating point during which time they will have 15 minutes to deliver their results to the Military Judge.

19. The reconnaissance should not involve the collision with, or damage of either the targets or the physical environment in the area to be reconnoitred. The system should not require operator intervention at the platform control level.

20. The system is expected to detect, locate and identify targets with the minimum number of false alarms. The system should not require operator intervention to perform this function.

21. The winner of the Grand Challenge, and the R J Mitchell Trophy, will be the Team in the Final that scores the most points, beyond a set threshold. If no Team achieves the threshold then the Trophy will not be won. The winning Team will have custody of the Trophy for a set period of time but the ownership of the Trophy will not be transferred.

22. The MoD is keen to recognise the efforts of all teams and therefore, there will be Additional Awards for technical excellence or innovation in the following areas:

- Most innovative solution
- Best use of autonomy
- Best overall systems approach
- Most imaginative use of national talent
- Judges merit award(s)

## **A Target Description**

- A.1 This annex provides an overview of the types of targets that are likely to be encountered at the Finale. Table A-1 summarises the target classes and their relative importance with 1 being the most important and 3 being the least important.

<b>Serial</b>	<b>Target Type</b>	<b>Relative Importance</b>
1	Improvised explosive device (IED) (Command wire element only)	1
2	Marksman operating from a building	1
3	'Technical' (civilian 4x4 with mounted heavy weapon) either in open or under cover	2
4	Armed people in military-style clothing	3

*Table A-1; Target Class Summary*

- A.2 Details of representative threats will be made available in due course. It should be noted that explosives and live ammunition will not be used during the Finale. For health and safety reason the IED will be simulated by a wire and a box laid on the ground.
- A.3 The targets will be placed in a variety of types of location varying from in-the-open to the fully obscured. More credit will be given for those targets that are obscured or partially obscured.

**B Finale Location and Area**

B.1 This section contains an overview of the likely characteristics of the area in which the Finale will be held.

B.2 The Finale will be carried out at Copehill Down. The reconnaissance area is likely to be approximately 150m by 150m.

B.3 Figure B-1 shows a general view of Copehill Down. Figure B-2 shows a schematic of the layout of buildings and the likely forward operating Base

*Figure B-1; Overview of Copehill Down*

*Figure B-2; Schematic of building layout*

**C**     **Marking Scheme**

C.1     This section details the marking criteria that will be used to generate the system ranking. It does not, as yet, detail the weightings to be applied to the different facets of system performance or the process by which the judging panel will aggregate their views and reach a consensus on the system ranking. These aspects of the assessment will be refined following:

- Identification of the team systems
- Further planning and organisation of the Finale.

C.2     The Finale Assessment methodology will be released in due course.

C.3     The marking scheme to win the Mitchell trophy is based on performance against the task.

C.4     The marking and assessment criteria are described in the following paragraphs.

C.5     The Additional Awards will be for technical excellence or innovation in areas contributing to the overall system. The number and areas for consideration will be determined by the judges during the course of the Grand Challenge but is likely to include both sub-system designs/technology and overall system concepts and operating schemes.

**Performance against the military task**

C.5 Table C-1 summarises the assessment criteria and associated marking scheme. It is also cross referenced against the Rules for the Finale as set out in the main body of this document. This will be supported by appropriate analytical tools.

Serial	Rule Ref	Criteria	Comment
1		Maximum number of threats correctly detected, located and identified	Points will be awarded per threat based on threat difficulty. Points will be awarded for threat detection & location and subsequently points for correct identification.
2		Minimum number of false threats declared.	False alarms are defined as declared threats that do not correspond to an actual threat.
3		Minimisation of operator intervention in information processing	This will assess the degree of autonomy in the threat analysis. Maximum points will be awarded for autonomous detection and identification. Minimum points will be awarded for operator detection and identification.
4		Platform autonomy and minimising operator intervention for platform operation	The degree of platform autonomy will be assessed.
Total Maximum Points			

*Table C-1; Military Task Marking*