

Handling Instructions: For MOD Use Only

# CLOSE COMBAT - SURVIVABILITY SOURCE VIRTUS SYSTEM INSTRUCTORS GUIDE



2019

ARMY  
BE THE BEST

## **Copyright**

The information contained within this publication is British Crown Copyright and the intellectual property rights belong exclusively to the Ministry of Defence (MOD). Material and information contained in this publication may be reproduced, stored in a retrieval system and transmitted for MOD use only.

## **Security**

This OFFICIAL document is issued for the information of such persons who need to know its contents in the course of their duties. Any person finding this document should hand it to a British Forces unit or to a police station for its safe return to the Ministry of Defence, Def Sy, Main Building, Whitehall, LONDON SW1A 2HB with particulars of how it was found. The unauthorised retention or destruction of this document may be an offence under the Official Secrets Acts 1911 – 89 or other legislation.

## **Status**

This publication has been produced under the direction and authority of the Chief of the General Staff by Head of Capability Ground Manoeuvre. It is the individual's responsibility to ensure that he or she is using the latest version of this publication. If in doubt the individual should contact Combat Publications (details below). The contents constitute mandatory regulations or an MOD Approved Code of Practice (ACOP) and provide clear military information concerning the most up to date experience and best practice available for commanders and troops to use for operations and training. To avoid criminal liability and prosecution for a breach of health and safety law, you must follow the relevant provisions of the ACOP. Breaches or omissions could result in disciplinary action under the provisions of the Armed Forces Act.

Amendments					
Amdt No	Date	Amdt No	Date	Amdt No	Date

## **Distribution**

As directed by Head of Capability Ground Manoeuvre.

## **Contact details**

Suggestions for change or queries are welcomed and should be sent to Combat Publications, Waterloo Lines, Imber Road, Warminster BA12 0DJ, Telephone +44(0)1985 222325.

## Contents

Introduction	v
References and Associated Publications	vii
<b>Chapter 1</b>	
<b>Basic Skills</b>	
Lesson 1. Sizing, Overview and Characteristics of the Virtus System	1-1
Lesson 2. The Chassis Subsystem - MOLLE Belt, Dynamic Weight Distribution (DWD) and the Torso Subsystem - The Scalable Tactical Vest (STV)	1-17
Lesson 3. The Pouches and Load Carriage Subsystems	1-42
Lesson 4. The Head Subsystem	1-61
Lesson 5. Extremities and Hydration Subsystems, VIRTUS Care and Maintenance	1-73
<b>Chapter 2</b>	
<b>Practice Periods</b>	
Introduction	2-1
Practice 1. Scaling of CPE Dress States	2-3
Practice 2. Use Of DWD and Load Carriage	2-5
<b>Chapter 3</b>	
<b>Additional Information for Use of the VIRTUS System</b>	
Section 1. VIRTUS Dress States and Use Guidance	3-1
Section 2. DCC Load Carriage	3-4

Any person wishing to propose amendments to this pamphlet is invited to do so by filling in this [Amendment Form](#). Such proposals will be given consideration and, if considered necessary appropriate amendments will be prepared and published.

Handling Instructions: For MOD Use Only

## Source VIRTUS System

### Introduction

1. This pamphlet contains the instructional material on the VIRTUS System to enable unit instructors to teach sizing, assembly, scaling of protection and use of the Dynamic Weight Distribution system to ensure the system is correctly worn and operated.
2. **Correct sizing of the system to the soldier will ensure maximum ballistic coverage, the most comfortable fit for the individual and effective integration between subsystems.**

### Layout of the Pamphlet

3. The pamphlet, written in lesson form, is divided into chapters as follows:
  - a. Chapter 1 contains a description of the equipment and the techniques a soldier is required to know.
  - b. Chapter 2 contains suggested practice period for the soldier to familiarise themselves and consolidate the information taught in Chapter 1.
  - c. Chapter 3 contains additional information for use of the VIRTUS system.
4. Each lesson is divided into two parts:
  - a. Part A — Instructor's Notes. This contains the information required by the instructor to enable him to prepare for the lesson.
  - b. Part B — Conduct of the Lesson. This contains the matter to be taught and is laid out in a proven sequence.
5. Words of command and instructions to the instructor are printed in italics.

### Instructional Techniques

6. Skill at Arms Instructors are taught how to deliver lessons on a qualifying course. They will have an understanding of those basic instructional techniques required to deliver SAA training. However, very rarely will a squad of soldiers all have the same learning style. It is therefore essential that the instructor has the skills and experience to be able to adapt his instructional methods to cater for the needs of those being trained. The guiding principle is that **all subject matter** must be delivered regardless of the level of experience and/or previous knowledge of the student.
7. There is of course latitude in the methods which can be employed by the instructor to deliver this matter, but ultimately the lesson must deliver and practice the students on the detail contained within the lesson in accordance with the Learning Specifications (LSPECs) for that lesson.

8. Instructors are **not** permitted to omit detail or adapt drills to save time. Instructors should always consult the chain of command if there is any doubt as to what is required

## Warnings and Cautions

9. VIRTUS provides a step change in capability and is designed as an integrated system. Therefore VIRTUS must be used as a system in order to deliver the capability. To that end the following is mandated:

- a. **System.** No non-issued load carriage, helmets or tactical vest equipment are to be used with the system.
- b. **Correct Use.** The VIRTUS System is only to be worn in the manner instructed on the Train-the-Trainer (T3) Cadre and subsequent cascade training. Incorrect use will reduce the capability that the system provides and may result in injury.
- c. **Training.** Only those who have received training on the T3 Cadre and subsequent cascade training are authorised to use the system. Training is to be recorded on JPA as a JPA Training Record.
- d. **Modifications.** There must be no local modifications of the system e.g. cutting holes, sewing on additions or painting etc unless approved by the Capability Sponsor (Head of Capability Combat).
- e. **Helmet Maintenance.** Helmet parts can be replaced in accordance with the VIRTUS Maintenance Manual and AESP. Only qualified VIRTUS Maintainers are authorised to conduct helmet maintenance.
- f. **VIRTUS Helmet use on MOD Vehicles.** For guidelines on the use of the VIRTUS Helmet whilst operating MOD vehicles in particular motorcycles, quads, ATV and MHE refer to the authoritative direction contained in JSP 800 Vol 5 Pt 2 Annex B, Group 2, Section 3, Leaflet 42 – Drivers Standing Orders.
- g. **Parachuting.** The helmet mini rails must have tape placed over them to negate the snagging hazard before parachuting can take place using VIRTUS.

## Residual Risks

10. The residual risks associated with the VIRTUS System are as follows:

- a. **Thermal Burden.** Commanders must be cognisant of the level of work and other environmental and physical factors that their soldiers might be subject to. JSP 539 (Climatic Illness and Injury in the Armed Forces: Force Protection and Initial Medical Treatment) cover the rules and regulations must be adhered to in order to minimise this risk.
- b. **Incorrect Use of the Non-Protective Training Plate (NPTP).** The NPTP only offers a representative size, shape and load of the in-service large ballistic plate. The NPTP offers no ballistic protection and must not be used for any activity that requires such protection.

11. Risk assessments should be conducted for each load carriage considering TILE:
  - a. T – Task (i.e. what is to be lifted and carried for how long and how far?)
  - b. I – Individual (i.e. is the individual capable of lifting and carrying the load in association with the task i.e. fatigue, strength?)
  - c. L – Load (e.g. how heavy is it, and is it an awkward shape (bulk), can it be broken down?)
  - d. E – Environment (e.g. cross country, up and down slopes, across gaps?)

## References and Associated Publications

1. Reference to the following publications appear in the text of this pamphlet, the full nomenclatures of which are listed here.
2. Where mention is made in the text, they are referred to by their reference as below.

<b>Reference</b>	<b>Code No.</b>	<b>Title</b>
A	71717	Fieldcraft and Battle Lessons and Exercises.
B	71807	The SA80 A2 (5,56mm) System and Associated Equipment.
C	71855	Pamphlet No. 21, Regulations for Training with Armoured Fighting Vehicles, Infantry Weapon Systems and Pyrotechnics.

## Abbreviations

CBRN	Chemical Biological Radiation and Chemical
CPE	Combat Protective Equipment
DWD	Dynamic Weight Distribution
ETH	Entrenching Tool Hand
NVG	Night Vision Goggles
PPE	Personal Protective Equipment
VQR	Vest Quick Release
SAF	Soft Armour Filler
STV	Scalable Tactical Vest
UGL	Underslung Grenade Launcher

## Chapter 1

### Basic Skills

#### Lesson 1. Sizing, Overview and Characteristics of the Virtus System

1-01 **Aim.** *To teach:*

- a. *How to size an individual for the VIRTUS system.*
- b. *The characteristics and a description of the VIRTUS system.*
- c. *The recognition of the subsystem components.*

1-02 **Timings.** *2 x 40 minute periods.*

1-03 **Method.** *Basic indoor instructional period.*

1-04 **Stores.**

*One complete set of VIRTUS (pre sized) per soldier and instructor.*

*VIRTUS User Assembly, Care and Maintenance Instruction manual, AESP 8470-B-010-201, one per soldier.*

*Tables (desk size is ideal or 1 x 6ft table per pair) and chairs for the instructor and soldier.*

*Area suitable for the VIRTUS System to be laid out correctly.*

*PowerPoint Lesson 1 (optional).*

*6 ft tables 1 x 2 soldiers*

1-05 **Preparation.**

a. *Lay out in position, or issue, all the stores required by each soldier.*

b. *Instructors are to refer to the AESP mentioned above to learn the named parts of the VIRTUS system.*

#### Preliminaries

1-06 *Lay out the classroom with enough space between each soldier to reduce mixing up the systems*

1-07 **Revision.** *Nil*

## Introduction

1-08 *Explain:* VIRTUS is the name given to the scalable, integrated body armour, helmet and load carriage system that can be combined in any configuration to suit the operation and changing threat level. VIRTUS is technically the most advanced military protection and load carriage soldier system in the world. Years of trials have proven scientifically that the design reduces fatigue therefore maximising combat performance. VIRTUS has a low profile that increases freedom of movement and allows the greatest amount of agility whilst retaining ballistic protection.

1-09 VIRTUS is individually sized so that ballistic coverage, comfort and freedom of movement is achieved and will enhance the integration between the VIRTUS system components.

## VIRTUS User Manual

1-10 *Explain:* The VIRTUS User Assembly, Care and Maintenance Instructions provide user guidance on how to construct and use the VIRTUS system. The manual gives detailed instructions on how to accurately measure an individual and should be used to record the measurements and sizes.

## Measuring

1-11 *Explain and demonstrate:* There are 5 measurements that have to be taken correctly and accurately. The following general measuring procedure applies to all measurements:

a. **Posture.**

- (1) Either standing or sitting upright, depending on the measurement being taken.
- (2) Arms relaxed to the side.
- (3) Measure at the point of normal breath intake.

b. **Method.**

- (1) To be conducted with an assistant.
- (2) Remove shirts (including T-shirts) and belts.
- (3) Use the tape measure provided.
- (4) Ensure measurements are taken with the tape measure level (parallel to the ground), except for head circumference.
- (5) Repeat each measurement twice. If measurements are different repeat until consecutive measurements are achieved.
- (6) Record measurement.

- 1-12 **Waist/Hip.** This will determine your Chassis size (MOLLE Belt).
- a. Remove waist belt.
  - b. Ensure the soldier is standing upright.
  - c. Find the top of the hip bone at the side of the body.
  - d. Measure 3 cm (approx. 2 fingers width below hip bone) on each side to identify reference points. The soldier should point to the two reference points using thumbs at 90 degrees to the body.
  - e. Using the tape measure, measure immediately below the reference points around the body keeping the tape measure level.
  - f. Note the measurement (do not record the measurement yet).
  - g. Repeat the process from the start to check the measurement was taken correctly. If you have noticeable difference between the first and second measurement repeat until you have two accurate consecutive measurements.
  - h. Record the measurement.
- 1-13 **Torso.** This will determine your DWD size and, combined with the chest measurement will determine your STV size (Note: there is no requirement for females being measured to remove underwear).
- a. Remove the shirt.
  - b. Ensure the soldier is sitting upright.
  - c. Place a fingertip on the notch above the sternum and between the collarbones.
  - d. Mark the chest under the fingertip with a pen to clearly identify the top of the sternum.
  - e. Ensure the soldier takes a normal breath in.
  - f. Holding the tape lightly against the skin measure from the mark to the top of the belly button at the point of normal inhalation. Females should measure between the bust.
  - g. Note the measurement (do not record the measurement yet).
  - h. Repeat the process from the start to check the measurement was taken correctly. If you have noticeable difference between the first and second measurement repeat until you have two accurate consecutive measurements.
  - i. Record the measurement.

1-14 **Chest Size.** Combined with your Torso measurement, this will determine your STV size (Note: females should be measured around the fullest part of the bust).

- a. Remove the shirt.
- b. Ensure the soldier is standing upright.
- c. Measure around the chest at nipple level. Females should be measured around the fullest part of the bust.
- d. Ensure the tape is level (parallel to the ground) all the way around. Exert only enough tension on the tape to maintain contact between the tape and the skin.
- e. Ensure the soldier takes a normal breath in.
- f. Note the measurement (do not record the measurement yet).
- g. Repeat the process from the start to check the measurement was taken correctly. If you have noticeable difference between the first and second measurement repeat until you have two accurate consecutive measurements.
- h. Record the measurement.

1-15 **Head Circumference.** This is to determine your helmet, visor, mandible and spectacle sizes.

- a. Ensure the soldier is sitting upright, with head looking directly forward.
- b. Measure a point 12 mm above the eyebrows and ears (approx a fingers width).
- c. Measure around the head from front to back (make sure that you maintain approx 12 mm gap above the eyes and ears (where the ears join the head)
- d. – this should result in the tape being lower at the back of the head than at the front).
- e. Use enough tension to compress the hair.
- f. Note the measurement (do not record the measurement yet).
- g. Repeat the process from the start to check the measurement was taken correctly. If you have noticeable difference between the first and second measurement repeat until you have two accurate consecutive measurements.
- h. Record the measurement.

1-16 **Head Length.** This is to determine your helmet, visor and mandible sizes.

- a. Ensure the soldier is sitting upright, with head looking directly forward.

- b. Using the VIRTUS Head Length Measuring Gauge hold the two parts of the measuring gauge in either hand on the right hand side of the soldier's head.
- c. Place the right hand part of the measuring gauge with the bottom corner approx 1 finger above the eyebrow.
- d. Place the left hand part of the measuring gauge at the back of the head with the measuring scale behind the front part. Read the measurement from the scale.
- e. Repeat the process from the start to check the measurement was taken correctly. If you have noticeable difference between the first and second measurement repeat until you have two accurate consecutive measurements.
- f. Record the measurement.

## Sizing

1-17 *Explain:* Using the measurements the correct sizes of equipment that will best fit the soldier can be determined. This is crucial to ensuring the correct ballistic coverage and comfort. The manual should be used to record onto the VIRTUS Sizing spreadsheet for the QM department. There are a number of points that need to be emphasised:

- a. STV and MOLLE Belt size – when determining the STV and MOLLE Belt size if your measurement is borderline, then take the smaller size.
- b. Helmet – when determining the helmet size if you have more than one choice take the larger size. If you fit 3 sizes of helmet select the middle size.
- c. Helmet – Helmet, Visor and Mandible are to be all the same size.

## Equipment

1-18 *Explain:* The VIRTUS system consists of 7 subsystems:

- a. Chassis subsystem.
- b. Torso subsystem.
- c. Pouches subsystem.
- d. Load Carriage subsystem.
- e. Head subsystem.
- f. Extremities subsystem.
- g. Hydration subsystem.

1-19 *Explain:* Each of the VIRTUS subsystems has a number of components. A brief overview of each subsystem will enable the soldier to organise and confirm that all components have been issued and increase familiarity with the VIRTUS system.

### **Chassis Subsystem**

1-20 *Explain and demonstrate:* The Chassis subsystem provides the platform for the pouches and forms part of the weight distribution system for reducing fatigue (see Fig 1-1).

- a. MOLLE Belt. 3 sizes available – small, medium and large.
- b. Yoke. 1 size available.
- c. DWD system. 2 sizes available – medium and large. 2 components:
  - (1) Sheath.
  - (2) Spine Bar.

### **Torso Subsystem**

1-21 *Explain and demonstrate:* The Torso subsystem provides the platform for the upper body protection that can be scaled to suit the threat (see Fig 1-2). There are 4 levels of combat protection with a total of 8 configurations all of which can be achieved with the Scalable Tactical Vest (STV). The STV has a low profile that provides a greater range of movement and increased agility whilst maintaining full ballistic coverage. The Torso subsystem consists of the following components:

- a. **Scalable Tactical Vest (STV).** The STV is individually sized for correct coverage and holds the Soft Armour Filler (SAF) and the Ballistic plates. The STV can be scaled from low profile soft armour through a plate carrier option all the way up to full ballistic protection. The STV comes with detachable side plate pockets. The STV is available in 8 sizes – small, medium, medium-wide, medium-long, large, large-wide, extra large and extra large-wide.
- b. **Soft Armour Filler Front, Back and Two Shoulder Pieces.** **SAF MUST be either stored flat or rolled to prevent creasing. Folding or creasing reduces the ballistic protection.**
- c. **Non-Protective Training Plate (NPTP).** These are orange in colour to denote that they are for training purposes. **The NPTP offers NO ballistic protection and must not be used for any activity that requires such protection.**

1-22 *Confirm by questions, check all soldiers Torso subsystem is complete.*



Fig 1-1. The Chassis Subsystem



Fig 1-2. The Torso Subsystem



Scalable Tactical Vest (STV)



STV Back and Front  
SAF Set



Non Protective Training Plate (NPTP)  
Front and Back Set

Fig 1-3. The Torso Subsystem Complete

## Pouches Subsystem

1-23 *Explain and demonstrate:* All pouches are labelled for identification; most pouches have MOLLE securing straps which allow them to be fitted or removed quickly wherever the individual requires them (see Fig 1-4). **Under no circumstances are non-issued pouches to be fitted to the VIRTUS system.**

- a. Ammunition pouch 5.56mm.
- b. Open Magazine Pouch 5.56mm.
- c. Magazine Drop Pouch.
- d. HE Grenade Pouch.
- e. Smoke Grenade Pouch.
- f. Bayonet Scabbard Pouch.
- g. Water Bottle Pouch.
- h. Utility Pouch.
- i. Medical Pouch with detachable bandolier.
- j. PRR Pouch.
- k. ETH Pouch.
- l. Ready to use Link Ammunition Pouch.

1-24 *Explain and demonstrate:* There are a number of specialist pouches that have been designed with user input to benefit specialist roles or tasks. The specialist pouches will be issued on a role basis.

- a. Sharp Shooter Magazine Pouch.
- b. Pistol Magazine Pouch.
- c. UGL Pouch with detachable inner elastic bandolier.
- d. UGL Bandolier.
- e. Commanders Pouch.
- f. PRC 354 Pouch.

1-25 *Confirm by questions, check all soldiers Pouches subsystem is complete. Place all pouches into Bergen.*



Fig 1-4. The Pouches Subsystem

## Load Carriage Subsystem

1-26 *Explain and demonstrate:* The load carriage subsystem consists the following components:

- a. Bergen – stored inside the top flap padded pocket of the Bergen is the Adjustable Sternum Strap.
- b. 40L Daysack.
- c. 17L Assault Pack.
- d. 7.5L Side Pouch x 2.
- e. 65L and 22L dry sacks.

1-27 *Confirm by questions, check all soldiers load carriage subsystem is complete.*

## Head Subsystem

1-28 *Explain and demonstrate:* The Head subsystem is designed to provide fragmentation coverage, bump protection and comfort whilst integrated with goggles and glasses (see Fig 1-6). The helmet and the load carriage system have been optimised to maximise head movement without impacting on load carriage. There are four sizes of helmets available (S/M/L/XL), all fully adjustable. The system comprises of (see Fig 1-7):

- a. Helmet with removable cover sized to the individual.
- b. Visor (sized to the helmet) offering fragmentation protection.
- c. Mandible (sized to the helmet) offering fragmentation protection.
- d. Low impact spectacles. 3 sizes available - small, regular and large.
- e. Medium impact goggles with cover.
- f. Rx OLC Lens Carrier for spectacle wearers used with goggles and eye wear.
- g. Night Vision counter weight.
- h. CBRN Chin Strap Extender.

1-29 *Confirm by questions, check all soldiers head subsystem is complete.*



Fig 1-5. The Load Carriage Subsystem



Fig 1-6. The Head Subsystem



Helmet with Removable Cover



Visor



Medium Impact Eyewear Goggles  
(one size)



Low Impact Eyewear Spectacles



Mandible



Rx OLC



CBRN Strap Extender



NVG Counter Weight

Fig 1-7. The Head Subsystem Complete

## Extremities Subsystem

1-30 *Explain and demonstrate:* The Extremities subsystem comprises of various soft armour filled attachments and the Knee Pads (see Fig 1-8). The extremities protection is easily fitted and removed to provide additional protection to the areas not already covered by the Head and Torso subsystems.

- a. **Collar Protection.** Worn in dress state 3.
- b. **Tier 2 Pelvic Protection.** Can be worn attached to the VIRTUS MOLLE Belt or direct to the soldier's own trouser belt.
- c. **Shoulder and Upper Arm Protection.** The arm protection is labelled left and right.
- d. **Lower Back Protection.** The Lower Back Protection is fitted to the MOLLE Belt to provide protection to the lower back.
- e. **Nape Protection.** Provides enhanced protection to the back of the head.
- f. **Knee Pads.** 2 Knee Pads issued with Knee Pad Carry Bag.

1-31 *Confirm by questions, check all soldiers Extremities subsystem is complete.*

## Hydration Subsystem

1-32 *Explain and demonstrate:* The Rider 3L Hydration Pack can be used independently with its own shoulder straps or attached to the STV, Day Sack or Bergen utilising the Quick Connect Attachment System (see Fig 1-9).

## Carry Bag Subsystem

1-33 *Explain and demonstrate:* The Carry Bags are designed to carry various components of the VIRTUS system. The Carry Bags provided are:

- a. NPTP Carry Bag – to carry NPTP, orange colour.
- b. Knee Pad Carry Bag.



Pelvic Protection Tier 2



Lower Back Protection



Nape Protection



Collar Protection



Shoulder and Upper Arm Protection



Knee Pads

Fig 1-8. The Extremities Subsystem



Fig 1-9. The Hydration Subsystem

## Conclusion

### 1-34 End of Lesson Drills.

- a. *Questions from the squad on the entire lesson.*
- b. *Confirm by questions and practice.*
- c. *Pack away Load Carriage, Head and Extremities subsystems.*
- d. *Summary. To include:*
  - (1) The importance of accurate measuring and sizing.
  - (2) The improved agility and freedom of movement due to better fit.
  - (3) The subsystems, organisation and stowage of them.

### 1-35 - 1-39. Reserved.

## Lesson 2. The Chassis Subsystem - MOLLE Belt, Dynamic Weight Distribution (DWD) and the Torso Subsystem - The Scalable Tactical Vest (STV)

1-40 **Aim.** To teach:

- a. *Fitting and adjusting of the Chassis Subsystem.*
- b. *The Scalable Tactical Vest and how to configure the STV for the CPE states.*
- c. *The fitting and use of the DWD.*

1-41 **Timings.** 2 x 40 basic instructional periods.

1-42 **Method.** Basic instruction.

1-43 **Stores.**

*VIRTUS User Assembly, Care and Maintenance Instruction manual, AESP 8470-B-010-201, one per soldier.*

*Tables (desk size is ideal or 1 x 6ft table per pair) for the instructor and soldier PowerPoint Lesson 2 (optional).*

*VIRTUS:*

*Chassis subsystem complete  
Torso subsystem complete  
NPTP and ECBA Plates  
Collar Protection*

1-44 **Preparation.** Pair off soldiers.

### Preliminaries

1-45 *Lay out the classroom with enough space between each soldier.*

### Introduction

1-46 *Explain:* The Chassis is the first layer of the VIRTUS System worn on the user, and it interacts with all other VIRTUS components. Carrying loads, regardless of weight, will fatigue the soldier, both mentally and physically, the heavier the load the quicker the soldier could fatigue. The VIRTUS system, incorporating the DWD, allows for loads to be distributed across the soldier's body therefore reducing the effects of fatigue and improving the soldier's performance. The Scalable Tactical Vest has a low profile that increases freedom of movement and allows the greatest amount of agility whilst retaining the ballistic protection and coverage.

## Chassis Subsystem

1-47 *Explain and demonstrate:* The Chassis subsystem provides the platform for the pouches and forms part of the weight distribution system for reducing fatigue.

a. **MOLLE Belt.** The MOLLE Belt is the first layer of the VIRTUS System worn on the user, and it interacts with all other components. The MOLLE Belt can be worn with or without the yoke. Indicate the following parts:

- (1) Front low profile buckle adjustable on both sides to centralise on the soldier.
- (2) Reverse pull tabs to allow easier forward tightening.
- (3) Pockets for stowing loose belt ends.
- (4) Yoke attachment points (monkey traps).
- (5) DWD Lumbar Sheath.
- (6) Tier 2 anchoring straps.
- (7) PRC 354 Pouch anchoring loop.
- (8) Lumbar Pad
- (9) 3 MOLLE webbing rows (attachment of pouches at two different levels, Small x 16, Med x 18, Large x 20 MOLLE Loops).

b. **Yoke.** 1 size.

- (1) Yoke Adjustment Buckles.
- (2) Adjustable Sternum Strap.
- (3) Rear Attachment Points.
- (4) MOLLE on back and shoulders.
- (5) Zips for 17L Assault Pack and Side Pouch attachment.

c. **DWD System.** Available in 2 sizes – Medium and Large.

- (1) DWD Sheath with MOLLE.
- (2) DWD Spine Bar.
- (3) DWD Control Unit. 3 operating positions – Closed, Semi-open and Open.
- (4) DWD Pull Loop.
- (5) Spine Bar Release Catch.
- (6) Elastic Loop. For stowage of the Pull Loop when in transit.
- (7) Locking tooth mechanism.

## MOLLE Belt and Yoke Fitting and Adjusting

1-48 *Explain and demonstrate with the squad imitating:* The MOLLE Belt straps should be configured to enable the belt to be tightened by pulling forward on the two loose ends of the belt. To re-configure the MOLLE Belt to ensure the straps are routed correctly follow the steps below:

- a. Open the MOLLE Belt lumbar pad and separate the Velcro between the inner belt and the outer belt.
- b. Pull one side of the inner belt and unthread it from the outer belt, ensuring the buckle is pulled through the opening of outer belt.
- c. Route the MOLLE Belt strap through the wide loop buckle attached to the inner belt and return towards the MOLLE Belt buckle.
- d. Thread the 3 waist belt straps back through the outer belt, ensuring that the inner belt is routed behind the padding. The end of the inner belt should be located in the small pocket at the end of the outer belt. Ensure that the loose end of the waist belt is exposed.
- e. Repeat for the other side, if required.

1-49 *Explain and demonstrate with the squad imitating:* To fit the MOLLE belt and yoke (see Fig 1-10):

- a. Don the MOLLE Belt and level on your hips at the soldiers preferred position (no Yoke fitted).
- b. Fasten the front buckle.
- c. Tighten by pulling the pull-tabs out and around to the front (ensure buckle is centred). If friction occurs on the webbing, tilt the tabs and the front buckle until the belt is firmly tightened.
- d. Tuck in the pull-tab ends and then tuck away the excess strap by poking with fingers in the middle creating a heart shape.

1-50 *Explain and demonstrate with the squad imitating:* To fit the Yoke (see Fig 1-11):

- a. Detach the Velcro Connector from the Yoke by undoing the Velcro Yoke length adjustment straps and removing from the Loop Buckles.
- b. Detach the MOLLE Belt Lumbar Pad from the back of the MOLLE Belt. Separate the MOLLE Belt Velcro back panel.
- c. Insert the Velcro Connector into the MOLLE Belt and position so that the Loop buckles are above the top of the MOLLE Belt and centralised. Reattach the MOLLE Belt Velcro and secure the MOLLE Belt Lumbar Pad.
- d. Attach the Yoke to the MOLLE Belt by threading the Yoke length adjustment straps through the Velcro Connector Loop Buckles.

Step 1



Step 2



Step 3



Step 4



Fig 1-10. MOLLE Belt and Yoke Fitting and Adjusting (1)



Step 1



Step 2



Step 3



Step 4

Fig 1-11. MOLLE Belt and Yoke Fitting and Adjusting (2)

1-51 *Explain and demonstrate with the squad imitating:* The Yoke can be worn in two types of configuration (see Fig 1-12).

- a. To attach the Yoke into a Backpack configuration, attach the Shoulder Strap Loop Buckles to the rear attachment points.
- b. To attach the Yoke into a Classic configuration, attach the Shoulder Strap Loop Buckles to the MOLLE Belt Front attachment points.



Fig 1-12. Yoke Configurations

1-52 *Explain and demonstrate with the squad imitating:* Inhale to full lung capacity and adjust the shoulder straps until the Yoke is tight to the body. Ensure the shoulder straps are both even (see Fig 1-13).

1-53 *Explain:* Positioning and use of the MOLLE Belt.

- a. The MOLLE Belt forms the first part of the system and all other parts will derive the right position from this.
- b. It is recommended that a  $\frac{1}{4}$  of the MOLLE Belt sits above the top of the hips, however the position can be altered as per user preference but the following should be noted:
  - (1) Better load distribution is achieved with the recommended fitting.

- (2) Better access to pouches is achieved with the belt lower.
- c. The MOLLE Belt should always be tight, almost overly tight. This provides support and protects the back whilst under strain.



Fig 1-13. Yoke Fitting and Adjusting (3)

### Assessing MOLLE Belt Fit

1-54 *Explain and demonstrate with the squad imitating:* To assess the fit measure the distance between the front edge of the MOLLE Belt hip pads. A correctly sized belt will be more comfortable, allow for correct tightening and enable effective weight distribution when using the DWD.

- a. If the measurement is less than 7cm from edge to edge of the front hip pads (the gap between comfort pads) select a smaller sized MOLLE Belt.
- b. If the measurement is greater than 16cm from edge to edge of the front hip pads select a larger sized MOLLE Belt.

### Protection Levels

1-55 *Explain.* There are nine torso subsystem CPE dress states (see Fig 1-14). These states will be dictated on operations by:

- a. The level of threat determined by the commander for the situation.

Torso Subsystem CPE Dress States	
State 1	Chassis with Load Carriage only, no physical protection. For use in extremes of temperature and permissive Ops environments.
State 2	Plate Carrier fitted with ECBA plates (Front and Back).
State 2a	Plate Carrier fitted with Osprey plates (Front and Back).
State 2b	Plate Carrier fitted with Osprey plates (Front and Back) and ECBA plates (sides).
State 3*	Body Armour Vest fitted with STV SAF to protect against fragmentation threats including integrated collar protection.
State 3a	Dress State 3 plus ECBA ballistic plate protection.
State 3b	Dress State 3 plus OSPREY ballistic plate protection.
State 3c	Dress State 3 plus OSPREY and ECBA ballistic plate protection. ECBA ballistic plates to be used as side plates.
State 4	Dress State 3c with increased protection to extremities; Shoulders and upper arms, Pelvic Protection, Lower Back Protection and Nape Protection.
Pelvic Protection	Pelvic Protection, to be a tiered system depending upon threat levels and specialist role. Pelvic Protection can be worn with Dress States 2, 3 or 4.
*Low Profile	Dress State 3 body armour less Collar Protection reduces bulk and can be worn under jacket.

Fig 1-14. The Torso Subsystem CPE Dress States

- b. Unit SOPs.
- c. Theatre Standing Instructions.

1-56 In all cases it is extremely important that the correct accessories are configured and are worn correctly to ensure the level of protection for the required dress state. On no account should the soldier forsake individual items for comfort or weight reduction if a specific dress state is ordered.

1-57 The STV has 4 configurations:

- a. Low Profile.
- b. Plate Carrier.
- c. Body Armour Vest.
- d. Full up vest including extremities.

1-58 *Confirm by questions.*

## **Scalable Tactical Vest (STV)**

1-59 *Explain and demonstrate:* The Scalable Tactical Vest (STV) can be easily and swiftly customised to address any emerging threat. It can be scaled to suit the environment and mission requirements whilst maintaining the best levels of operational performance. It is lighter than its predecessor and has a reduced profile that allows greater freedom of movement and increases agility.

a. The STV is individually sized for correct coverage and holds the Soft Armour Filler (SAF) and the Ballistic plates. It includes:

- (1) The vest has an OSPREY pocket front and rear that also houses the ECBA plate pockets.
- (2) SAF pocket, front rear and shoulders.
- (3) Vest Quick Release (VQR) mechanism. (Highlight the red tabs on VQR system).
- (4) Side securing buckles and straps and strap stowage pocket.
- (5) Right shoulder closure.
- (6) Drag handles.
- (7) Dynamic Weight Distribution attachments straps.
- (8) Shoulder loops for shoulder extremities protection.
- (9) Elasticated loops for the hydration system.

- (10) Interior side pockets for folding away side panels when in the plate carrier configuration.
- (11) Female velcro inside the nape for attachment of the nape protection.
- (12) Detachable side plate pockets (left and right). Part of the protection levels and not normally worn. Indicate press studs for attachment of side plate pockets.
- (13) Elastic loop for DWD Controller. Located either side at the base of the rear plate pocket.
- (14) Single MOLLE attachment point for Collar Protection attachment.
- (15) Elastic cord to secure the Collar Protection Front Pad.

## Fitting the SAF

1-60 *Explain and demonstrate with the class imitating.* The SAF provides the low velocity and fragmentation protection. To fit the SAF (see Figs 1-15 and 1-16):

a. **Shoulders.**

- (1) Turn the STV over exposing the tan side of the STV.
- (2) Ensure you insert the shoulder SAF into the correct side. The contour of the shoulder SAF corresponds with the contour of the STV cover.
- (3) Insert the SAF into the shoulder pocket, ensuring the label is facing toward the body.
- (4) Manipulate the shoulder SAF so that it fits into the edges and close the Velcro opening, ensuring the Velcro fully overlaps.
- (5) The shoulder SAF remains fitted to the STV only being removed if the STV cover is machine washed (as per care label instructions).

b. **Front and Back.**

- (1) With the STV facing tan side up, open SAF compartment. Fold the side flaps of the SAF (with the label of the SAF facing up) and insert into the compartment (ensure the elastic cord in the front SAF compartment is underneath SAF, away from the body).
- (2) Reach inside the shoulder area to ensure the SAF is fully inserted and aligned to the STV cover. Secure the position by fastening the round Velcro on the SAF with the corresponding Velcro in the STV cover.
- (3) Unfold the SAF side flaps and align with the STV cover edges.



Step 1



Step 2



Step 3



Step 4

Fig 1-15. Fitting the Shoulder SAF to the STV (1)



Step 1



Step 2



Step 3



Step 4

Fig 1-16. Fitting the SAF to the STV (2)

(4) Turn the STV face up and ensure the SAF is positioned under the bottom SAF compartment closure.

(5) Close SAF pocket making sure the Velcro fully overlaps.

## Donning the STV

1-61 *Explain and demonstrate with the students imitating* (see Fig 1-17). The correct method of donning and securing the vest will ensure that protection is evenly distributed across the torso and that a comfortable fit is achieved. To don the vest conduct the following:

- a. Fully loosen the side clips and tightening straps so that the buckles are fully forward.
- b. Place over the head (ensure the VQR is at the front).
- c. Level the vest so the top is level with the top of the sternum bone and the vest front and rear panels are level.
- d. Attach the 4 side buckles ensuring they are all correctly aligned and not twisted.
- e. Slightly tighten one side with one hand while the other hand pushes the front panel under the back panel. Repeat the other side.
- f. Check the side panels have the rear sections overlapping the front and there are no kinks.
- g. Before tightening the left and right straps, inhale to full lung capacity and then firmly tighten the straps, by pulling the pull loops out and round to the front.
- h. Conceal the excess strap by slightly lifting excess strap retention flap and stuffing the excess strap under the flap.

1-62 To remove the STV: Undo the clips and lift over the head. Extend the side clips to prepare for re-donning the STV.

## Alternative Method of Doffing and Donning the STV with a Helmet Fitted

1-63 An alternative method of doffing and donning the STV when wearing a helmet is as follows:

- a. With the STV on, leave the left side of the vest attached.
- b. Release the right side clips and undo the shoulder closure on the right side. The vest will fall away to the left.
- c. To don, loosen the right side clips fully put the left arm through the arm hole.



Fig 1-17. Donning the STV

- d. Attach the right shoulder closure Velcro fully.
- e. As previously, align and attach the side clips, ensure the back panel overlaps the front.
- f. Take a deep breath and tighten, secure loose straps.

1-64 *Confirm by practice leaving the student wearing the STV.*

## **Assessing STV Fit**

1-65 *Explain and demonstrate with the squad imitating:* The soldier should assess the fit of the STV to ensure effective coverage and integration of the VIRTUS system. It is recommended that the assessment be made whilst wearing dress state 3B (SAF and Osprey/NPTP). To assess the fit measure the following points:

- a. **Torso Length.** The STV should be positioned with the top at the base of the suprasternal notch (top of the sternum bone) and the bottom at the top of the belly button. If it is too short you will not have sufficient coverage and too long will hinder integration with the MOLLE Belt.
- b. **Width.** The STV side flaps should overlap by a minimum of 50mm to ensure effective soft armour coverage

## **Vest Quick Release (VQR)**

1-66 *Explain and demonstrate with the students imitating (see Fig 1-18).* The VQR allows the system to be quickly removed in an emergency. It uses a one handed rip cord system which fully opens one side of the STV. The VQR system is to be used as a last resort and not a means to remove the STV for convenience.

- a. To operate the VQR system.
  - (1) Grasp the emergency quick release tab and release from the red Velcro (left or right hand can be used to operate VQR).
  - (2) Pull the tab firmly up in a 45 degree angle to release mechanism.
  - (3) Let go of the VQR safety pin (it is secured to the STV with an elastic cord).
  - (4) Drop the STV to the right.
  - (5) When the STV is dropped the DWD spine (if fitted) automatically disconnects from the MOLLE Belt Lumbar Sheath.
- b. To reassemble the VQR use the following sequence to reduce wear on the system:



Fig 1-18. Vest Quick Release (VQR)

- (1) Align the two webbing loops on the left VQR Side Release Buckle with the corresponding VQR side hinges on the STV front panel. The connecting strap between the VQR Side Release Buckles should be facing down.
- (2) Insert the long VQR safety pin through the corresponding loops downwards until it clicks in place.
- (3) Align VQR two plastic loops on the left shoulder with the corresponding VQR top hinges on the STV front panel.
- (4) Insert the short VQR safety pin through the corresponding loops until it clicks in place.
- (5) Ensure the red Velcro pull strip is properly attached and pull the elastic cord to secure the quick release tab in place.

1-67 *Confirm by practice ensuring the correct sequence is used to reassemble the VQR.*

### **Inserting the Plates**

1-68 *Explain and demonstrate:* The OSPREY and ECBA plates provide high velocity protection. They are shaped to fit the body and are labelled to assist in correct fitting and coverage of the torso. The orange plates are Non-Protective Training Plates (NPTP) and provide no ballistic protection. They are used for training purposes only. Explain and demonstrate with the class imitating.

a. **Inserting the ECBA Plates.** The ECBA plates can be fitted to the STV front and back or used as side plates when OSPREY plates are fitted. To fit the ECBA plates to the front and back in lieu of the OSPREY plate:

- (1) Open the plate pocket and locate the smaller pocket.
- (2) Open the smaller pocket and loosen the Velcro (Velcro is used to reduce the profile and ensure secure fitting throughout the STV).
- (3) Ensure the ECBA plate is facing the correct direction and insert it into the pocket.
- (4) Secure the Velcro pocket firmly so that there is no movement (note: all plate pockets face down the body, this is the same for the side plates later).
- (5) Secure the larger pocket ensuring that all the Velcro is securely fastened.

b. **Removing the ECBA Plates.**

- (1) To remove the plates undo the Velcro and slide the plates out.
- (2) Smooth down the pocket to retain a low profile, ensuring the ECBA and Osprey plate pocket flaps are closed.

1-69 *Confirm by practice.*

1-70 **Inserting the OSPREY Plates** (see Fig 1-19). The OSPREY plates provide ballistic protection to the torso: To fit the OSPREY plates:

- a. Insert OSPREY plate into pocket. Make sure you are using front plate in front panel and back plate in back panel with plate curve facing body. Using your thumbs, push the bottom of the Osprey plate inward until fully inserted into the pocket.
- b. Unfold the bottom flap and insert in-between the plate and corresponding male Velcro on the inner side of the pocket. While using your fingers to separate male and female Velcro, push closure flap inward until male and female Velcro fully overlaps. This will ensure there is no movement of the plate in pocket.

1-71 **Removing the OSPREY Plates.**

- a. To remove the plates undo the Velcro and slide the plates out.
- b. Smooth down the pocket to retain a low profile, ensuring the plate pocket flap is closed.

1-72 *Confirm by practice the different VIRTUS dress states, leaving the vest in 3b (OSPREY plate fitted).*

## **Collar Protection**

1-73 **Collar Protection.** *Explain and demonstrate with the class imitating.* The Collar Protection is worn when in VIRTUS CPE dress state 3 and above. The collar protection consists of two pieces; a large collar piece and a smaller throat piece. To fit the collar, remove the throat piece (if attached):

- a. Thread the rear connection loop through the top central MOLLE row on the STV back panel. Fasten the press stud.
- b. Turn the STV inner side up. Fold the collar in half and fasten the centre collar flap Velcro.
- c. Fasten the remaining collar flaps to the STV.



Step 1



Step 2



Step 3



Step 4

Fig 1-19. Inserting the OSPREY Plates

- d. Turn STV outer side up. Thread the front connection loop through the single MOLLE loop on the STV front panel. The MTP side of the front collar should face outwards. Fasten the press stud.
- e. To wear attach the front collar to the rear collar using the Velcro.
- f. When not using the front collar it can be stowed using the elastic cord on the front of the STV.

1-74 *Confirm by practice.*

### **Side Plates**

1-75 *Explain and demonstrate with the students imitating.* The side plates provide additional ballistic protection to the torso.

1-76 To fit the side plates do the following:

- a. Insert the ECBA plate into the side plate pocket and firmly fasten the Velcro closure so that there is no movement of the plate in the pocket.
- b. Side plate pockets are labelled left and right. Ensure they are assembled to the correct side of the vest. The side plate pocket opening always faces down.
- c. Attach the side plate pocket to the STV by threading the buckle straps under the vertical loop making sure the Velcro opening of the side plate pocket is facing inward and down.
- d. Connect the press studs on the side plate pocket to the corresponding row of fasteners on the side reinforced flap of the STV.
- e. Don the vest and with an assistant adjust the side plate to the correct position (central on side of torso). Record the correct position for later reference.
- f. To remove undo the press studs and slide off.

### **Plate Carrier**

1-77 *Explain and demonstrate with the students imitating.* VIRTUS CPE Dress State 2 is a plate carrier configuration, which is created using the STV. The ballistic plates are worn but the large SAF is removed to reduce bulk, weight and thermal burden. To convert the STV to a plate carrier:

- a. Remove front and back SAF, roll it up (*do not fold as this will over time damage the material*).
- b. Turn the vest on its back and locate the interior side flap pockets.

c. Open the pocket and fold the side flap away the re-secure the Velcro. Repeat for the remaining STV side flaps.

d. Insert the ballistic plates to the required VIRTUS CPE Dress State.

1-78 *Confirm by practice the different dress levels.*

### Dynamic Weight Distribution System

1-79 *Explain:* The DWD, combined with the VIRTUS system has been proven to reduce the cognitive burden experienced by the soldier when operating with heavy loads and combat protective equipment. The DWD allows the user to reduce fatigue on muscle groups enabling the soldier to recover more effectively. The VIRTUS system with the DWD reduces the feeling of load carried by the users shoulders, assists with reducing thermal burden and reduces discomfort. The reduction of these three elements aid to reducing the overall fatigue felt by the soldier, helping to increase the soldiers' cognitive ability (see Fig 1-20).

1-80 *Explain and demonstrate with the squad imitating:*

1-81 The DWD consists of a sheath and spine bar. The sheath is attached by MOLLE straps to the STV, bergen or day sacks. The spine release catch at the opening of the sheath is lifted to remove the spine bar.

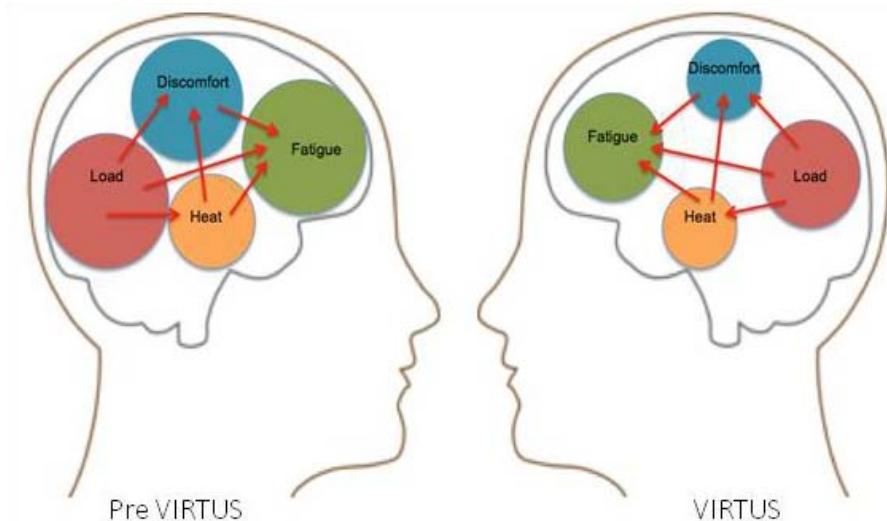


Fig 1-20. The Impact of Fatigue, Discomfort, Load and Heat on a Soldiers Performance and Decision Making

1-82 The DWD system enables the soldier to determine the load distribution between the shoulders and the hips, from 100% on the shoulders to 100% on the hips in increments of approximately 15%. This can be achieved either while standing or on-the-move depending on the mission or terrain.

**1-83 Button Positions.**

- a. **Open.** Button depressed – teeth are disengaged, free movement of the spine bar = 100% load on the shoulders.
- b. **Closed.** Button extended – teeth engaged, spine bar locked.
- c. **Semi-Open.** Button half pressed – used when making adjustments.

1-84 *Practice with the soldiers familiarising themselves with the button positions.*

### **Attaching the Sheath and Spine Bar**

1-85 *Using the STV explain and demonstrate with the squad imitating.*

1-86 The sheath can be quickly attached to and removed from the STV, day sack or bergen (see Fig 1-26). The selection of system to attach the DWD to that the most benefit can be gained from is as follows:

<b>NO OSPREY Plate</b>	<b>NO DWD</b>
OSPREY plate fitted	DWD on STV
OSPREY plate fitted + Day sack weighing LESS than 20 Kg (44 lbs)	DWD on STV
OSPREY plate fitted + Day sack weighing MORE than 20 Kg (44 lbs)	DWD on Day sack
Bergen being used	DWD on Bergen

**1-87 To Fit the Sheath to the STV.**

- a. Separate the DWD sheath from the spine bar by pressing the controller button to open, pulling the spine bar out of sheath whilst lifting the spine bar release catch.
- b. Thread the sheath vertical straps onto the STV back panel MOLLE starting at the 2nd row from the top.
- c. Loop back through MOLLE on sheath horizontal straps.
- d. Continue routing the vertical straps through the STV back panel 3rd, 4th and 5th MOLLE rows, ensuring the MOLLE is weaved.
- e. Thread the lower horizontal Velcro fastenings on the STV through the sheath slots (located either side at base of sheath). Do not fasten yet.

f. Thread the vertical straps under the 6th MOLLE row, tighten downwards and then reverse backwards and insert the strap under the sheath.

g. Fasten the horizontal Velcro fastenings to keep the sheath in position when under load.

**1-88 Spine Bar.**

a. To fit the spine bar press the button on the control unit to open mode. Insert the DWD spine bar into the sheath and all the way in. Ensure the spine bar back face is facing down (curve in towards the users body).

b. Press the button to closed mode.

c. Insert the control unit into the left or right elasticated loop with the press button facing down and away from the stv plate pocket.

**1-89 Confirm by practice, leave attached to the STV.**

**Connecting the DWD to the MOLLE Belt**

**1-90 To connect the DWD to the MOLLE Belt (see Fig 1-21):**

a. Press the DWD button to open position and with the other hand locate the end of the spine bar and DWD pull loop.

b. Insert the bottom of the spine bar into the MOLLE Belt lumbar sheath. Move aside the DWD pull loop.

c. Fasten the Velcro on the DWD pull loop to match the Velcro on the lumbar sheath.

**1-91 Confirm by practice, leave DWD connected to the MOLLE Belt.**

**Assessing DWD Size**

**1-92 Explain and demonstrate:** When using the DWD for the first time check that the spine bar is within its load distribution “working zone”. To check the DWD is correctly sized do the following;

a. Whilst wearing the DWD attached to the STV, set the DWD to open mode (100% weight on the shoulders).

b. There are two horizontal embossed marks on the spine bar (this is your operating range). The base of the sheath should sit between the two marks.

c. Dependent on whether you have an M or L spine bar the following adjustments can be made:

(1) If the top mark is visible replace the DWD spine bar from M to L



Step 1



Step 2



Step 3



Step 4

Fig 1-21. Connecting the DWD to the MOLLE Belt

(2) If the bottom mark is not visible replace the DWD spine bar from L to M.

(3) If on replacing the spine bar with a M, the bottom mark is still not visible you need to reassemble the DWD sheath on your STV back panel one MOLLE row higher (1st row from top), securing with the upper horizontal Velcro fastening.

1-93 *Confirm by practice.*

## Using the DWD

1-94 *Explain and demonstrate with the soldiers in VIRTUS dress state 3B:* Constantly shifting the load and adjusting the amount from hips to shoulders will reduce the onset of fatigue.

1-95 **To Shift the Load.**

- a. Press the button half way down to the semi open position with one hand.
- b. Lean forward to extend the spine bar while pulling the DWD pull loop with the other hand. The clicks will mark the extension of the bar.
- c. Once extended release the button to the closed position (button fully extended on controller) locking the spine bar and stand upright.
- d. You will feel the distribution of the weight between the shoulders and the hips.
- e. Repeat the process leaning further forward to alter the amount of weight distributed.
- f. To reduce the load on the hips follow the same procedure but lean forward initially to release the pressure on the spine bar.
- g. If excessive pressure or discomfort is felt in the lower back ensure the MOLLE Belt is firmly secured around the waist. A tight MOLLE Belt is good, providing support for the lower back and distributing the load to the hips more effectively.

1-96 **DWD Use Modes.** The DWD can be used in two modes to maximise the performance of the soldier. These modes are:

- a. **Assault Mode.** Entire load is carried on the shoulders in order to avoid any restriction when running and to maintain maximum agility. This is achieved by depressing the button fully to open mode.
- b. **March/Patrol Mode.** The load is distributed between the shoulders and the hips. This can be done dynamically whilst moving to rest muscle groups. 100% transfer of load to the hips for long periods of activity is not recommended.

1-97 **Air Flow.** The DWD can be used to circulate air around the torso without removing the STV, to do so raise the STV to its maximum height and lock it (you could also loosen the side straps). You can also release the right shoulder strap.

1-98 **Sitting.** When sitting in a vehicle you can lower the weight on to the hips which will distribute the load to the seat rather than the shoulders

1-99 *Confirm with questions and practice.*

1-100 **Operating the VQR with the DWD attached to the STV.**

a. Operate the VQR as previously instructed.

b. The DWD will automatically disconnect from MOLLE Belt lumbar sheath, allowing the STV to fall away from the body.

1-101 *Confirm with practice.*

1-102 **To Remove the DWD.**

a. Undo the horizontal securing fasteners and unthread the sheath vertical straps.

b. Firmly pull the sheath vertical straps upward, pulling them from the top part of the sheath. The MOLLE straps will unthread.

c. Turn the sheath 90 degrees and lift up to unthread and separate the sheath from the back panel.

## Conclusion

1-103 **End of Lesson Drill.**

a. *Questions from the squad on the entire lesson.*

b. *Confirm by questions and practice.*

c. *Pack up leaving STV in VIRTUS Dress State 3b.*

1-104 - 1-109. Reserved.

## Lesson 3. The Pouches and Load Carriage Subsystems

1-110 **Aim.** To teach:

- a. *The fitting and features of the VIRTUS pouches.*
- b. *The Bergen and day sack features.*
- c. *Fitting and adjusting the Bergen and day sack.*
- d. *Use of the DWD system with the Bergen and day sack.*

1-111 **Method.** 2 x 40 min basic instructional period.

1-112 **Stores.**

*VIRTUS User Assembly, Care and Maintenance Instruction manual, AESP 8470-B-010-201, one per soldier*

*PowerPoint Lesson 3 (optional)*

*VIRTUS:*

*STV configured to Dress State 3b*

*Pouch Subsystem*

*Chassis Subsystem complete (including DWD)*

*Load Carriage Subsystem complete*

*Webbing contents in accordance with unit SOPs*

*Day sack/Bergen load in accordance with unit SOPs*

*200rd Belt of 7.62 Drill Link Ammunition*

*10rds of Drill 40mm UGL*

*PRC 354/355 for demonstrating how to fit in PRC 354 pouch and day sack*

1-113 **Preparation.** Pair off soldiers.

### Preliminaries

1-114 **Safety Precautions.** Ensure all ammunition is drill.

1-115 Lay out the classroom with enough space between each soldier.

### Introduction

1-116 **Explain:** Load carriage is an enduring task for all infantry. A soldier must carry enough equipment to survive, fight and win on the battlefield, a task made all the harder when they are physically and mentally tired. VIRTUS improves on the tried and tested hip and shoulder carriage system using research and trials conducted into human performance to develop an integrated Dynamic Weight Distribution system that reduces the effects of fatigue. Correct use of the DWD will improve a soldiers' physical performance when carrying weight, be it the STV, day sack or bergen, and ensure that the onset and the effects of fatigue will be reduced.

## VIRTUS Pouch Subsystem

1-117 *Explain and demonstrate with the squad imitating.* All the VIRTUS pouches have universal design features. These are:

- a. **MOLLE Design.** The MOLLE design has been enhanced by using longer straps to enable easier routing and fastening is done with Velcro (no studs) for easier assembly and disassembly.
- b. **Method of Closure.** The pouches have two forms of closure, Velcro and either press studs or buckles, depending on the pouch.
- c. **Pouch Design.** The majority of the pouches are manufactured from one piece of material making them stronger due to less stitching and seams. This design also allows the pouch to fold flat when not in use, further reducing the profile and bulk of the soldier.
- d. **Labelling.** All pouches are individually labelled, either between the two vertical MOLLE straps or behind single vertical MOLLE strap.

## Positioning the Pouches

1-118 *Explain and demonstrate with the squad imitating.* The MOLLE Belt has 3 rows of MOLLE. It is important to attach the pouches to the correct MOLLE row to ensure access and prevent discomfort.

1-119 Don the STV and identify how many rows are visible on the MOLLE Belt. If you can see all 3 rows then you can attach the pouches from the top or middle row. If only two rows are visible then you must attach from the middle row (you must ensure that 2 rows are exposed for secure fitting of the pouches).

1-120 For better access to pouches the MOLLE Belt can be positioned lower on the waist, however this will sacrifice proper load distribution to the hips.

1-121 *Check all soldiers to ensure they select the correct row. If not enough rows are exposed lower the belt.*

## Attaching MOLLE

1-122 The pouch straps are attached by feeding them alternatively through the MOLLE on the belt and the MOLLE on the pouch (see Fig 1-22).

1-123 Once threaded through the MOLLE reverse fold the vertical strap edge back under the pouch horizontal strap and fasten the Velcro.



Step 1



Step 2



Step 3



Step 4

Fig 1-22. Attaching MOLLE

## Attaching Pouches

1-124 Pouches can be placed as directed by unit SOPs anywhere on the system. The VIRTUS pouches can also be attached to the STV, day sack or Bergen depending on user preference and unit SOPs. Final adjustment of the yoke straps can only be achieved with the correct load, ensure the Y of the yoke remains between the shoulder blades.

1-125 *Confirmation. Allow the soldiers to attach pouches as required.*

## VIRTUS Pouch Features

1-126 *Explain and demonstrate using the relevant pouches:* There are a number of design features on the pouches that allow for easier use and carriage of specific items.

- a. **Water Bottle Pouch.** The water bottle pouch has an internal strap to aid with removing the water bottle from the pouch. To use detach the Velcro fastening and pull up, lifting the water bottle. Behind the strap is a stowage pocket for the 24hr ORP spork.
- b. **Magazine Drop Pouch.** Can be attached directly to the MOLLE Belt using the MOLLE strap or attached beneath the Magazine pouch using the clip. The Magazine Drop pouch can be folded and stowed using the Velcro strap when not in use.
- c. **PRC 354 Pouch.** The pouch can be fitted to the left or right side of the MOLLE Belt and will fit the KDU either side of the pouch in the KDU pocket.  
To fit:
  - (1) Select the MOLLE loops either 2/4 or 3/5 from the back centre of the MOLLE Belt and using the MOLLE attach the pouch.
  - (2) Thread the top stabiliser anchoring strap into the buckle on the inside of the MOLLE Belt.
  - (3) Route the KDU cables through the side cable slots.
  - (4) Insert the radio into the main compartment and connect the cable to the radio.
  - (5) Pull the drawstring on the top sleeve to tighten around the antenna and cable.
  - (6) Thread the top stabiliser strap over the radio and connect the buckle. Firmly tighten the strap to ensure radio stability on the MOLLE Belt.

- d. **PRR Pouch.** The PRR pouch can be fitted to the STV front panel or the shoulder straps of the day sack and Bergen. The PRR pouch can be rotated up to 45 degrees to angle the antenna away from the neck/face.
- e. **UGL Pouch and Bandolier.** The UGL Pouch will hold 10rds of UGL ammunition in an elasticated strip located within the pouch. To use open pouch, fold top flap and secure using Velcro and partially pull out the elasticated strip and connect to the Velcro on the front of the pouch. The UGL bandolier is worn over the head and can be rotated around the waist to enable better access.
- f. **Link Ammunition Pouch.** The link ammunition pouch can hold 200rds of 5.56mm or 7.62mm linked ammunition, enabling the soldier to use the ammunition directly from the pouch onto the feed tray of the machine gun. To use:
- (1) Open the top flap of the link ammunition pouch and with a hand hold the pouch up by the top flap.
  - (2) Ensuring the ammunition is correctly orientated (to allow it to feed directly from the pouch to the machine gun) drop the link ammunition into the pouch allowing it to naturally fill the pouch from the bottom.
  - (3) Secure the first 1 or 2 rds in the Velcro pocket.
  - (4) Close the top flap.
  - (5) The link ammunition pouch can be carried as a bandolier or folded in half (secure using stowage strap) and stowed in a day sack.

## **VIRTUS Bergen**

1-127 *Explain and demonstrate using the Bergen:* There are many similarities between the Bergen and day sack. Indicate the following parts:

- a. Bergen rear exterior:
  - (1) Side compression straps.
  - (2) Large top flap with padded pocket containing the adjustable sternum strap.
  - (3) MOLLE webbing for attaching pouches and equipment to rear and sides.
  - (4) Name badge holder.
  - (5) MOLLE webbing for attaching pouches and equipment.
  - (6) Excess strap elastic retention loop.

- (7) Side zips compatible with 7.5L Side Pouch.
  - (8) External fixing straps.
  - (9) Bottom access opening to main compartment.
  - (10) Side pockets for long items.
- b. Bergen front exterior:
- (1) DWD sheath connection.
  - (2) Sternum strap.
  - (3) Top stabiliser straps.
  - (4) Top carrying handle.
  - (5) Equipment securing carabiner.
  - (6) Shoulder strap MOLLE.
  - (7) Hydration tube/cable routing strap.
  - (8) Elastic loops for DWD control unit.
  - (9) 2L External Padded Compartment for HMNVS or LUCIE
- c. Bergen Removable Waist Belt:
- (1) Waist stabiliser buckle.
  - (2) Waist belt buckle.
  - (3) Waist belt adjuster.
  - (4) MOLLE for pouch attachment.

## VIRTUS Day Sack

1-128 *Explain and demonstrate using the day sack:* The 40L General Users day sack features both a top and clamshell opening to the main compartment. Indicate the additional following parts:

- a. 40L Day Sack Rear Exterior Features:
- (1) Side Compression Straps.
  - (2) 2L Padded Top Compartment.
  - (3) 1.5L Top Lid Pocket.
  - (4) Bottom flap for the attachment of external load.
  - (5) Excess strap elastic retention loop.

- (6) Side Zips Compatible with 7.5L Side Pouch.
  - (7) MOLLE webbing for attaching pouches and equipment.
  - (8) Name badge holder.
  - (9) Side pockets for longer items.
- b. 40L Day Sack Internal Features:
- (1) 10L Expandable Pull String Storage Space.
  - (2) 22L Main Cargo Compartment.
  - (3) Zipped Internal Storage pocket.
  - (4) Equipment securing carabiner.
  - (5) Zipped internal lid storage pocket.
- c. 40L Day Sack Front Exterior Features:
- (1) DWD Sheath Connection.
  - (2) Sternum Strap.
  - (3) Top Stabiliser Straps.
  - (4) Hydration Tube or Cable Routing Strap.
  - (5) Top Carrying Handle.
  - (6) Excess strap retention loop.
  - (7) Elastic loop for DWD Control Unit (one on each side).

## **VIRTUS 17L Assault Pack**

1-129 *Explain and demonstrate using the 17L assault pack:* The 17L Assault Pack features a 12L main compartment and can be worn using the shoulder straps or attached to either the Yoke or Bergen using the vertical attachment zips. Indicate the additional following parts:

- a. 17L Assault Pack Back Exterior Features:
- (1) Full length frontal storage pocket.
  - (2) Side compression straps
  - (3) Name badge holder.
  - (4) MOLLE webbing for attaching pouches and equipment.
  - (5) Side Pocket for Longer items.

- (6) 12L Main Cargo Compartment.
  - (7) Top Stabiliser Straps.
  - (8) Top Padded Compartment for HMNVS or LUCIE.
  - (9) Hydration Bladder compartment.
- b. 17L Assault Pack Front Exterior Features:
- (1) Sternum strap.
  - (2) Top stabiliser straps.
  - (3) Top carrying handle.
  - (4) Vertical attachment zips.
  - (5) Shoulder strap attachment point.
  - (6) Hydration pocket.

## Using the VIRTUS 17L Assault Pack

1-130 *Explain and demonstrate: (see Fig 1-23)*

- a. The 17L Assault Pack can be attached to the Bergen side zips for carriage. Care should be taken not to overload the Assault pack as the bergen will become off balanced.
- b. The issued Hydration Bladder can be inserted in to the 17L Assault Pack hydration pocket and the drinking tube routed through the slot between the shoulder straps.
- c. The PRC 354/355 can be fitted into the 17L Assault Pack. Route the Antenna and Cables through the Antenna Port and Cable Routing Slots. The PRC 354/355 is then secured using the internal vertical and horizontal straps.
- d. The 17L Assault Pack can be worn independently using the integral shoulder straps or attached to the rear of the Yoke using the integrated zips.



Fig 1-23. VIRTUS 17L Assault Pack

## Load Carriage Design Features

1-131 *Explain and demonstrate using a day sack:* There are number of design features on the load carriage system that, when used correctly will provide benefit to the user. Incorrect use of the design features will have a detrimental effect and increase the onset of fatigue.

- a. **Posture.** Carrying a load on the back of a human being changes the centre of gravity through the line of gravity, altering the balance of a person. This alteration of balance requires stress and strain on the muscles to compensate which in time result in a change to the ideal posture (i.e. leaning forward).
- b. **Stability.** Moving forward changes the line of gravity and to compensate for the change of balance we step forward (see Fig 1-24). With no load over even terrain the ideal gait is achieved. Carrying a load that is not stable causes a pendulum effect and the line of gravity moves much further requiring more physical effort.
- c. **Sternum Strap.**
  - (1) The sternum strap provides stability for the load and relieves strain and pressure caused by the shoulder straps pulling back on the pectoral and shoulder muscles. The pressure eventually leads to the shoulders being pulled backwards that can compress the chest cavity against the OSPREY plate inhibiting breathing and moves the centre of gravity rearwards which in turn requires more energy to achieve forward motion.
  - (2) The sternum strap has 2 mounting positions. The top position offers more stability of the load. The lower position pulls the shoulder straps closer together allowing for a greater range of movement by the arms. There is an adjustable sternum strap for outsized soldiers.
- d. **Shoulder Straps and Adjusters.** The width of the shoulder straps spreads and evens out the load over the shoulders. The strap adjusters are used for stability and for adjusting the height of the pack in relation to the head. Loosening the straps will lower the pack.
- e. **Top Stabilisers.** The top stabilisers bring the load closer to the body moving the natural centre of gravity and increases stability. They also provide additional stability to prevent movement of the load, further reducing the burden.

1-132 *Confirm by questions.*

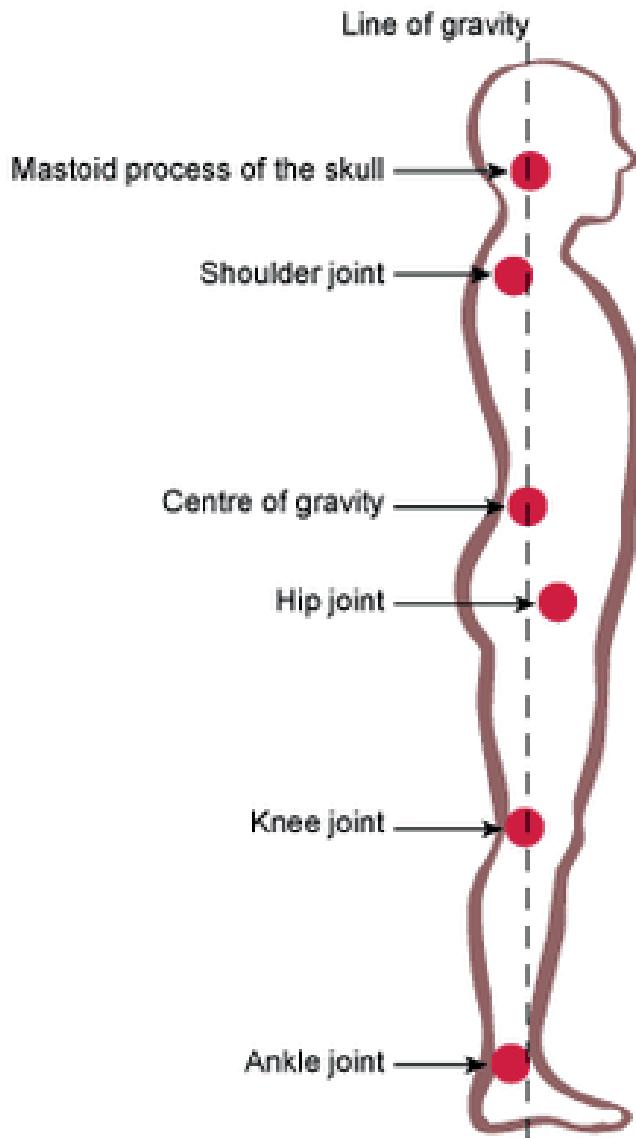


Fig 1-24. Stability and Posture

## Donning Day Sack and Bergen

1-133 *Explain and demonstrate with the students imitating:* The procedure for donning the day sack and bergen is identical and should be followed each time a load is carried (see Fig 1-25).

- a. Before donning loosen the four harness straps about halfway; the top stabilisers and the shoulder straps.
- b. Lift the pack from the side and thread one hand through the shoulder strap and then thread the other hand.
- c. Lean forward and with the load on your back and not on the shoulder straps, connect the sternum strap.
- d. Shrug the pack up and forward while pulling the shoulder strap adjusters firmly downward.
- e. Stand up straight and pull the top stabiliser straps forward to bring the pack mass as close as possible to your back.
- f. Ensure shoulder straps and sternum strap are level; vertically and horizontally.

## Levelling Day Sack and Bergen

1-134 *Explain and demonstrate with the students imitating:* The procedure for levelling the day sack and bergen is identical and should be followed each time a load is carried. For best performance and free head movement when in the prone position, level the pack so the stabiliser buckle is level or slightly above the shoulder (see Fig 1-26).

- a. To lower the pack:
  - (1) Release the top stabilisers.
  - (2) Gently release the shoulder strap adjusters to let the pack slide downward by gravity.
  - (3) When the pack is at the correct level tighten the top stabilisers.
- b. To raise the pack:
  - (1) Release the top stabilisers.
  - (2) Shrug the pack up and forward while pulling the shoulder straps adjusters firmly downward.
  - (3) When the pack is at the correct level tighten the top stabilisers.



Step 1



Step 2



Step 3



Step 4



Step 5



Step 6

Fig 1-25. Donning Day Sack and Bergen



Fig 1-26. Levelling Day Sack and Bergen

- c. The sternum buckle should be located on the sternum bone. If there is a feeling of tightness caused by the sternum strap slightly release the top stabilisers. This will help reduce pressure on the chest.

1-135 *Confirm by practice donning and doffing.*

### **VIRTUS Bergen Mk3 Removable Waist Belt**

1-136 *Explain and demonstrate:* The Bergen comes fitted with a removable waist belt. To detach the waist belt (see Fig 1-27):

- a. Detach The waist stabilizer buckles.
- b. Separate the Velcro from the back of the Bergen and waist belt.
- c. Pull the belt clear of the padded back panels.

1-137 *Explain and demonstrate:* To attach the removable waist belt (see Fig 1-28):

- a. Insert the waist belt ensuring the tan side is uppermost and the belt is correctly orientated.
- b. Centre the belt and Velcro into place.
- c. Attach the waist stabiliser buckles.



Fig 1-27. VIRTUS Bergen Mk3 Detachment of Removable Waist Belt (1)



Fig 1-28. VIRTUS Bergen Mk3 Attachment of Removable Waist Belt (2)

## Fitting the DWD to the Day Sack and Bergen

1-138 *Explain and demonstrate:* The DWD is fitted to the day sack using MOLLE (see Fig 1-29):

- a. Remove the DWD spine bar as previously taught.
- b. MOLLE the sheath on as previously taught, starting from the 2nd row from the top between the two shoulder pads of the pack.
- c. Fasten the horizontal securing fastener to keep the sheath in position when under load.
- d. Press the button on the control unit to open mode and insert the DWD spine bar through the back panel routing loop. Ensure the spine bar back face is facing up (towards the soldier's body).
- e. Insert the control unit into the elastic loop with the press button facing down and towards the spine bar.
- f. To remove the DWD use the method as taught for removal from the STV.

1-139 *Confirm by practice.*



Fig 1-29. Fitting the DWD to the Day Sack

## Fitting the DWD to the VIRTUS Bergen Mk3

1-140 *Explain and demonstrate:* The DWD is fitted to the Bergen using the Integrated DWD Sheath (see Fig 1-30).

- a. Ensure the DWD is orientated with the Horizontal MOLLE straps facing uppermost.
- b. Pull the Vertical MOLLE straps through the DWD Sheath so approximately half the strap sits either side of the DWD Sheath.
- c. Open the DWD pocket by removing the large Velcro flap and securing straps.
- d. Keeping the Spine bar and Sheath connected, insert the Sheath into the DWD pocket.
- e. Fasten the Securing straps and Velcro flap tightly.
- f. Insert the control unit into the elastic loop with the press button facing down.
- g. To remove the DWD reverse the steps.



Fig 1-30. Fitting the DWD to the Bergen

## Using the DWD with the Day Sack and Bergen

1-141 *Explain and demonstrate:* Use of the DWD is the same when attached to the day sack or Bergen as when used with the STV. The DWD can still be used attached to the day sacks or Bergen with or without the STV being worn. The DWD will sit in the recess in the day sack or Bergen and will not be felt by the user. To use the DWD when fitted to the day sack or Bergen:

- a. Don the day sack or Bergen as previously taught.
- b. Adjust the pack to ensure it is correctly fitted and leveled.
- c. Connect the DWD spine bar to the MOLLE Belt Lumbar Sheath as previously taught.

1-142 *Attach the sheath and spine bar to the day sack and practice using the DWD.*

## Donning Day Sack and Bergen When Wearing the STV

1-143 *Explain and demonstrate with the students imitating:* The donning of the day sack and Bergen whilst wearing the STV is to be done as previously taught. A couple of additional points to note:

- a. Before donning loosen the four harness straps about halfway; the top stabilisers and the shoulder straps. The straps will need to be longer to achieve a comfortable fit.
- b. The sternum strap should be positioned around the 2nd row of top MOLLE on the STV front. If it is not, level the pack to achieve optimum fit and comfort.
- c. To lower the sternum strap, raise the pack.
- d. The daysack can still be worn with the DWD fitted to the STV. The DWD will sit in the recess in the day sack.

## Dry Sacks and Side Pouches

1-144 *Explain and demonstrate:* 2 dry sacks are provided in 65L and 22L sizes. To use a dry sack correctly, the top must be rolled 3 or 4 times before the buckle is closed.

1-145 The side pouch can be zipped to the either day sack or the Bergen. To attach the side pouch:

- a. Zip Both side of the pouch to either side to the Pack
- b. Tighten the side compression straps ensuring they are routed through the side pouch vertical strap.

1-146 *Confirm by practice.*

## Attaching STV to the Bergen

1-147 *Explain and demonstrate:* The STV can be attached to the bergen for transport and stowage. To attach:

a. **STV.**

- (1) Undo the Bergen top flap buckles and place the STV on the front of the Bergen with front panel facing down and top aligned with the top of the Bergen.).
- (2) Secure the Bergen and STV with the top flap straps. 'Do not fold the STV side flaps when securing the STV to the Bergen. This will damage the SAF.'

## Conclusion

1-148 **End of Lesson Drills.**

- a. *Questions from the squad on the entire lesson.*
- b. *Confirm by questions and practice.*
- c. *Pack up leaving STV in Dress Level 3b.*
- d. *Summary. To include:*
  - (1) The importance of the correct donning of the day sack and Bergen.
  - (2) Encouraging the soldiers to constantly distribute the weight.

1-149 - 1-159. Reserved.

## Lesson 4. The Head Subsystem

1-160 **Aim.** To teach:

- a. *Fitting and adjusting of the helmet.*
- b. *Fitting and adjusting of the visor and mandible.*
- c. *The head subsystem accessories.*

1-161 **Method.** 1 x 40 min basic instructional period.

1-162 **Stores.**

*VIRTUS User Assembly, Care and Maintenance Instruction manual, AESP 8470-B-010-201, one per soldier*

*PowerPoint Lesson 4 (optional)*

*Head subsystem complete*

*Combination tool, one per soldier*

1-163 **Preparation.** Pair off soldiers.

### Preliminaries

1-164 Layout the classroom with enough space between each soldier.

### Introduction

1-165 **Explain:** The helmet is lightweight and comfortable, it maximises the levels of visual and audio sensory awareness whilst providing ballistic coverage. It has been designed to operate with your bergen and day sack to minimise head interference. It can be fitted with a visor, HMNVS or LUCIE 2 which work in conjunction with a counterweight on the rear of the helmet. The visor and mandible can be quickly fitted to increase ballistic protection for top cover sentries or in static locations. The goggles and eye wear integrate with the helmet subsystem and can be fitted with prescription lenses.

### Helmet

1-166 **Explain and demonstrate:** The Head subsystem is designed to provide fragmentation coverage, bump protection and comfort. The shape is designed to enhance integration with the other VIRTUS subsystems.

- a. Helmet shell and cover with elasticated straps for fitting of scrim and local camouflage.
- b. Front mount.
- c. Accessory mini rails (dependent on issue).
- d. Mandible mounting slot.

- e. Screw heads/mandible back strap anchors.
- f. Adjustable Modular Suspension system and chin strap.
- g. Fit band and adjuster.
- h. Velcro for helmet counterweight.
- i. D ring.
- j. Comfort pads.
- k. Harness net and Velcro tab adjusters.
- l. Impact Pad Liner (Do NOT remove or adjust – position is set to ensure effective bump protection).**

### **Helmet (Fitting And Adjusting)**

1-167 **Fitting the Helmet.** *Explain and demonstrate.* Place the helmet on the soldier and conduct the following:

- a. Loosen the helmet retention harness by pulling out the centre tabs on each of the tensioners. Loosen the fit band (turn anti clockwise). Place the helmet on the head and ensure it is level.
- b. Do up the chin strap.
- c. Adjust the two back tensioners by sliding them forward to tighten and press the centre tab to lock. The chin piece is to be fitted snugly on the chin with no slack in the straps.
- d. Adjust the two side tensioners by sliding them downward to tighten and press the centre tab to lock. There should be no slack in the straps.
- e. On the rear of the fit band, turn the dial clockwise to tighten the fit band around the head.

1-168 **Assessing the Helmet Fit.** Assess the fit of the helmet by checking the following (see Fig 1-31):

- a. Move the head up and down and make sure there is minimal movement and the helmet feel secure.
- b. Front brim should sit a finger width above the eyebrows (approx. 12mm).
- c. The side of the helmet should be level with the ear canal opening (place fingers in the ears to check the level).

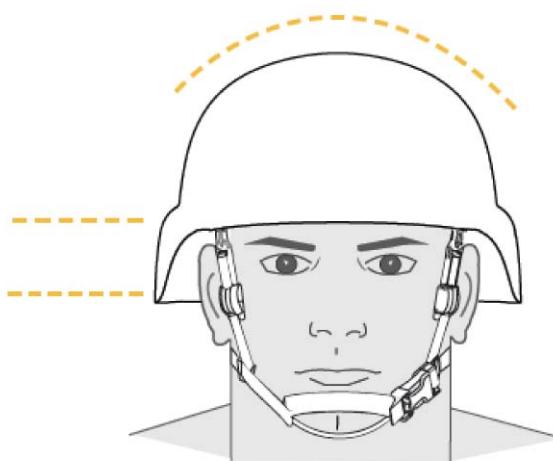


Fig 1-31. Assessing the Helmet Fit

1-169 **Adjusting the Helmet.** **Do not remove any of the impact pads. These are essential to reducing brain injuries following shock and blast.** If after fitting and checking the fit it is not correct then you can make the following adjustments:

- a. Too high or too low - adjust the Velcro straps in the helmet net to raise or lower the helmet.
- b. Too loose – tighten the fit band, tighten the straps (may need smaller retention system).
- c. Too tight – loosen the fit band, loosen the straps (may need larger retention system).

1-170 If none of the above results in the correct fit then replace the helmet with the next size of smaller or larger version. If a smaller or larger retention system (chin strap) is required a qualified VIRTUS Maintainer can exchange the retention system on the helmet for the alternate size. **Users MUST NOT disassemble the VIRTUS Helmet.**

### **Helmet Cover Replacement**

1-171 *Explain and demonstrate:* The VIRTUS Helmet now comes with a removable cover that can be fitted to helmets with or without mini rails. To fit the cover (see Fig 1-32):

- a. Identify if the VIRTUS helmet is fitted with or without Mini rails. If the helmet has Mini rails ensure the internal flap covering the Mini rail access is folded back and secured using the internal Velcro.
- b. Locate the front of the helmet cover (large square opening) and position over the Helmet Front Mount. If Mini rails are installed fit the helmet cover from the rear to ensure Mini rail access holes locate around the Mini rail correctly.
- c. Pull the helmet cover over the helmet shell ensuring all Mandible Mounting Slots and rear bolt access holes are correctly aligned.
- d. Ensure all wrinkles are removed and helmet cover is correctly positioned on the helmet shell.
- e. To secure the helmet cover to the helmet shell attach the Velcro tabs to the Velcro dots inside the helmet shell.



Fig 1-32. Helmet Cover Replacement

## Fitting the Mandible

1-172 *Explain and demonstrate:* The mandible provides additional facial protection and is sized to match the helmet size. It comprises of:

- a. Mandible guard.
- b. Rivet heads.
- c. Back strap.
- d. Screw clips.
- e. Back buckle.
- f. Tri-glide buckle.
- g. Thumb screws.
- h. Adjustment bolts.

1-173 **Fitting.** To fit the mandible (see Fig 1-33):

- a. Locate the rivet heads into the mandible mounting slots located on the sides of the helmet front mount.
- b. Slide the screw clips onto the screw heads located at the rear of the helmet.
- c. Fasten the back buckle.
- d. If the back strap is loose (even slightly) release the back buckle and shorten the back strap by sliding the two tri-glide buckles inward toward the helmet rear and centre. If the back strap is too short and the buckle cannot be connected, lengthen the back strap by sliding the tri-glide buckles outward. Repeat until the back strap is tight when you fasten the back buckle.
- e. To remove, undo back buckle, slide screw clips off the rear screw heads and lift the mandible up and out of the mandible mounting slots on the helmet.



Step 1



Step 2



Step 3



Step 4

Fig 1-33. Fitting the Mandible

## The Visor (with the mandible fitted)

1-174 The visor provides debris protection. It can be combined with the mandible to provide maximum facial coverage. It comprises of:

- a. Clear visor.
- b. Visor arm.
- c. Visor arm release catch.
- d. Visor mount locking catch.
- e. Gasket.

1-175 **Mechanism.** Fully raise the visor arm release catch so that it is locked in position and observe the position of the visor arm release catch in the centre of the visor arm, it is above the recess in the visor arm. By pushing the visor arm release catch down one click the visor arm locks into a second position, the tip of the catch is below the recess of the visor arm. Pushing it down a further time exposes the locking lug and permits free movement of the visor arm (open position).

1-176 **Fitting.** *Explain and demonstrate (see Fig 1-34).*

- a. Remove and retain the front mount cover.
- b. Push the visor release catch down and move the visor into the open position.
- c. Ensure the visor mount locking catch (which slides to the left and right) is fully to the right when looking at the visor from the front. Locate the protrusion on the top of the plate into the recess in the mount, push the plate downwards and move the visor mount locking catch to the left.
- d. To remove the visor slide the visor mount locking catch to the right and the mount is released.

1-177 **Operating.** *Explain and demonstrate with the students imitating:*

- a. The visor can be placed in 3 positions:
  - (1) **Open.** Visor up.
  - (2) **Vented.** One click, note the air gap between the visor and mandible.
  - (3) **Closed.** Visor is down. Pressure is required to ensure the gasket is fully sealed to ensure maximum protection.

1-178 *Confirm by practice.*



Fig 1-34. Fitting the Visor and Counter Weight

## Adjusting the Mandible

1-179 *Explain and demonstrate:* The mandible can be adjusted to ensure correct fit with the visor. The bottom edge of the visor should overlap with the mandible guard, leaving no visible gap when looking from the front. A combination tool or similar is required to adjust the mandible screws.

- a. **Mandible Stability.** For full stability of the mandible guard on the helmet, loosen or tighten the inner thumb screws on either side of the mandible guard to that the helmet trim is sitting on the side rests.
- b. **Visor Seal.** For a proper seal with the visor, mount the visor and secure it in the closed position. If there is a restriction or no overlap, loosen the two adjustment bolts on both sides of the mandible guard. Adjust the mandible guard to the correct position and retighten the screws.

## Counterweight

1-180 The counterweight allows you to compensate and balance the weight from the front of the helmet when wearing HMNVS or LUCIE 2. The counterweight consists of a small pack of weights (each weighing 150g), with a material flap on the front with the label and a smooth side of Velcro on the back.

1-181 To prepare it for use, fully open the large Velcro panel from the back (this will expose a material T bar), lift up the flap at the front and secure the large Velcro panel under the flap. The counterweight can now be fitted to the back of the helmet and the T bar fitted to the helmet loop for extra security (see Fig 1-34). When not using the counterweight fasten the back closure on the pouch back to reduce wear and to prevent snagging when stowed.

## CBRN Extender Strap

1-182 When wearing the helmet with the General Service Respirator (GSR) the CBRN extender strap can be fitted to the helmet chin strap to lengthen the retention system straps.

## Eye Protection

1-183 *Explain and demonstrate:* The VIRTUS system includes low impact spectacles and medium impact goggles. Both can be fitted with Rx OLC to allow fitting of corrective lenses.

- a. **Low Impact Spectacles.**
  - (1) Available in 3 sizes – small, regular and large.
  - (2) Consists 3 interchangeable lenses – clear, yellow and dark.
  - (3) Slim line frame with adjustable arms and head strap.

(4) To remove the lens from the frame, hold the lens above the nose piece and pull the centre of the frame to detach. Finally remove the two ends. To replace the lens reverse the process.

b. **Medium Impact Goggles:**

(1) Consists 3 interchangeable lenses – clear, yellow and dark.

(2) Adjustable head strap.

(3) Anti-reflective sleeve.

(4) To remove the lens from the frame, pull the frame from the top and bottom centre, peeling it away from the lens. To replace the lens fit the lens into the frame slot ensuring the keyhole notches are securely fitted over the posts. Ensure there are no gaps between the lens and frame.

(5) To remove the anti-reflective sleeve hold the frame and pull the side clip forward to detach from the frame. The sleeve can then be removed from the strap. To replace reverse the process.

c. **Rx OLC:**

(1) Consists of the Rx carrier and nose bridge.

(2) The Rx carrier fits directly onto the nose piece of the low impact spectacle. The nose bridge is not required. Insert the Rx carrier and push onto rectangular post until it clicks into place.

(3) To fit to the medium impact goggle first fit the nose bridge with the bumper pad facing towards the lens, away from the face. Insert the Rx carrier and push onto rectangular post until it clicks into place.

## **Inspection, Care and Maintenance of the Helmet**

1-184 The helmet will be refurbished by a qualified VIRTUS Maintainer between issues and should be inspected for damage and loose parts routinely and when first received. Visually check for cracks or deformations in the shell and ensure the harness screws and bolts are secure.

1-185 The visor arm should be oiled approximately every 2 months and in wet and damp conditions every month.

1-186 Lenses are only to be cleaned using mild soap and water or eye wear cleaning solution, rinse and dry with a soft cloth. Do not use any other product to clean the lens or abrasive materials to wipe the lens. After cleaning lenses retreat with anti-fog wipes.

## Conclusion

### 1-187 End of Lesson Drills.

- a. *Questions from the squad on the entire lesson.*
- b. *Confirm by questions and practice.*
- c. *Pack up.*
- d. *Summary. To include:*
  - (1) The importance of a correctly fitted helmet.
  - (2) Adjusting the mandible to provide correct coverage.

1-188 - 1-199. Reserved.

## Lesson 5. Extremities, Hydration and VIRTUS Care and Maintenance

1-200 **Aim.** To teach:

- a. *Fitting of the extremities subsystem.*
- b. *The hydration subsystem.*
- c. *Care and maintenance of the VIRTUS system and ballistic plates.*

1-201 **Method.** 2 x 40 min basic instructional period.

1-202 **Stores.**

*VIRTUS User Assembly, Care and Maintenance Instruction manual, AESP 8470-B-010-201, one per soldier*

*PowerPoint Lesson 5 (optional)*

*VIRTUS System complete*

*STV configured to Dress State 3b (with Collar protection fitted)*

1-203 **Preparation.** Pair off soldiers.

### Preliminaries

1-204 *Layout the classroom with enough space between each soldier.*

### Introduction

1-205 *Explain:* The VIRTUS system allows the soldier to add additional protection that will enhance the protection afforded by the STV. The extremities subsystem is designed to integrate effectively with all other components of the VIRTUS system, improving coverage, fit and comfort when worn by the soldier.

### Extremities Subsystem

1-206 *Explain and demonstrate with students imitating:* The fitting of the Collar protection has been covered in scaling the STV and the VIRTUS CPE Dress States. The remaining extremities protection is fitted in the following way:

1-207 **Lower Back Protection.** This can be worn depending on the threat in any Dress State when the MOLLE Belt is worn. Lower Back Protection is installed behind the lumbar pad of the MOLLE Belt providing protection to the lower back. To attach and use the protection:

- a. Access the lumbar pad closure by separating the Velcro at the bottom of the MOLLE Belt.
- b. Open the lumbar pad closure by pulling the closure tab outwards.
- c. Insert the Lower Back Protection panel with its cut corners facing up into the MOLLE Belt left and right hip pads.

- d. Firmly pull the lumbar pad downward over the Lower Back Protection and reverse fold over the bottom of the MOLLE Belt and fasten the Velcro closure.

1-208 *Confirm by practice.*

1-209 **Tier 2 Pelvic Protection.** This can be worn depending on the threat in Dress States 2, 3 and 4. To attach and use the protection (see Fig 1-35 and Fig 1-36):

1-210 **Folding the Tier 2 Pelvic Protection.**

- a. (If not folded away correctly or on first issue) Open the Tier 2 Pelvic Protection fully.
- b. Turn it over so that the camouflage is facing you.
- c. Fold the front panel towards the mid panel.
- d. Fold the mid and front panels against the back panel.
- e. Fold 1/3 of the mud panel so the Velcro flap is adjacent to the securing flap and fasten the securing flap.
- f. Connect the buckles to avoid excess loose straps hanging.

1-211 **Attaching And Deploying The Tier 2 Pelvic Protection.**

- a. Ensure the label of the Tier 2 is facing the inside of the MOLLE Belt and thread the square loop buckle onto the anchoring straps on the inside of the MOLLE Belt.
- b. The elasticated straps with poppers allow the protection to be fitted to a trouser belt when the MOLLE Belt is not worn.
- c. To use the Tier 2 Pelvic Protection when the MOLLE Belt is worn release the buckles on both sides and release the securing flap to allow the Tier 2 Pelvic Protection to drop down.
- d. Bring the pelvic protection forward under the groin and to the front.
- e. Fasten the two buckles located on both sides of the hips.
- f. Pull the reverse pull tabs forward until fully tightened, tucking the excess strap under the pelvic protection front panel.
- g. Secure the elasticated loops around the MOLLE Belt and fasten the press studs.
- h. To re-stow reverse the process.

1-212 *Confirm by practice.*



Step 1



Step 2



Step 3



Step 4

Fig 1-35. Attaching and Deploying the Tier 2 Pelvic Protection (1)



Step 5



Step 6



Step 7

Fig 1-36. Attaching and Deploying the Tier 2 Pelvic Protection (2)

1-213 **Shoulder and Upper Arm Protection (SUAP).** The shoulder protection is labelled left and right and must be fitted to the correct sides of the STV to ensure proper ballistic coverage. Fitting can be done individually or with assistance. To attach:

- a. Thread the 2 closure straps through the corresponding loop on the STV shoulder strap until fold on closure is aligned with the loop on the STV shoulder. Fasten the closure using the Velcro.
- b. Secure the arm fastener strap to achieve the desired shoulder protection circumference.
- c. Without threading arms into the SUAP, don and adjust the STV.
- d. Thread arms upright through the sleeves on the SUAP.
- e. Adjust the SUAP arm strap to achieve optimum fit. Use assistant if necessary.

1-214 *Confirm by practice.*

1-215 **Nape Protection.** The Nape Protection can be added to the Helmet to increase the fragmentation protection coverage afforded by the helmet. To attach:

- a. Remove the nape comfort pad from the rear of the helmet fit band.
- b. Attach the Nape Protection to the corresponding Velcro on the rear of the helmet.

1-216 *Confirm by practice.*

1-217 **Knee Pads.** The Knee Pads offer improved comfort to the soldier. To use:

- a. When fitting the Knee Pads ensure the fastenings are on the outside of the knee with the ground grippers facing down.
- b. Wrap the rear fastening straps around the back of the knee and connect the anchoring loops onto the corresponding anchoring rivets.
- c. Adjust the Knee Pad straps to firmly secure the knee pad and connect the Velcro to secure the loose ends.
- d. To improve comfort the soldier can loosen the upper strap, allowing the lower strap to hold the knee pad in position.

1-218 *Confirm by practice and finish with the student in VIRTUS Dress State 4 (including Helmet with Visor and Mandible fitted).*



Fig 1-37. VIRTUS Dress State 4

## Hydration Subsystem

1-219 *Explain and demonstrate:* The Hydration subsystem provides 2 x 3L hydration systems, both offering a wide opening, glass like interior finish that gives taste free water with no plastic aftertaste. The hydration reservoir and drinking tube consists of the following parts:

- a. Helix Bite Valve with Dirt-shield.
- b. QMT tube connector with shut-off allows quick and no drip removal of the reservoir for filling.
- c. Weave covered drinking tube, interchangeable between the side pack and Rider hydration systems – offering 2 different length tubes.

1-220 **Rider Hydration Pack.** *Explain and demonstrate:* The Rider Hydration Pack can be used independently or attached to the STV, day sack or Bergen. It consists of the following parts:

- a. Insulated textile cover designed to keep water cooler.
- b. Adjustable shoulder straps with tuck-away pockets.
- c. Quick Connect Attachment system (QCA) for easy mounting to STV or Pack.
- d. Top and side, left and right tube routing slots for top tube routing (over the shoulder) and side tube routing (under the arm).

1-221 **Hydration Subsystem Maintenance.** *Explain and demonstrate:*

- a. Rinse the reservoir and drinking tube with water. Allow to dry prior to storing.
- b. Do not scrub inside the reservoir; this has a glass like finish to prevent bacteria from growing. Scrubbing the reservoir will destroy the glass like finish.

## Carry Bag

1-222 *Explain and demonstrate:*

- a. Knee Pad Carry Bag.
- b. Non-Protective Plates Carry Bag.

## VIRTUS System Care and Maintenance

1-223 *Explain and demonstrate:* Routinely conduct a visual inspection of all system components to identify the following:

- a. Wear and tear of main fabric material and sewn components.
- b. Cracks and other breakage of plastic parts like buckles, VQR or DWD.
- c. Cracks or deformation of rigid armour like ballistic plates, face protection and helmet.
- d. Visible damage or excessive wear to the SAF inserts.
- e. Damaged items should be replaced.

1-224 **Spare Parts.** *Explain and demonstrate:* A number of components can be replaced to maintain the VIRTUS system. These include:

- a. Side Release Buckle. The buckle can be threaded onto webbing that was holding the original buckle.
- b. Vest Quick Release Safety Pin.
- c. Hydration Valve Kit.
- d. Hydration system for Rider and Side Pack Hydration Systems.

1-225 **Cleaning.** *Explain:* Clean the VIRTUS system on a regular basis from dust and dirt. Use a soft brush to clean delicate parts. Textile components can be laundered as per label instructions, ensuring to remove all SAF inserts prior to machine washing. Before storage, allow the system to fully dry.

1-226 **Equipment Failure Reports.** *Explain:* Any equipment failures should be reported using the Equipment Failure Report form, detailing the failure and how it occurred.

## Ballistic Plate Care and Maintenance

1-227 *Explain and demonstrate:* The ECBA and Osprey Ballistic Plates should be routinely inspected to ensure they are serviceable. Unserviceable plates should be returned for refurbishment or destruction. The ballistic plate inspection routine is:

- a. Conducted by the user every time a ballistic plate is used.
- b. Conducted by the QMs when a ballistic plate is issued or received.
- c. Conducted on an annual basis for stock that has not been used or has remained stationary.

1-228 *Explain and demonstrate:* ECBA Plate Inspection is to be conducted using the following process:

- a. **Stage 1 – Flex Test.** Hold the plate firmly at each end and apply a twisting force. If flexing or grinding can be felt or heard then the plate is unserviceable and must not be used. The item is to be marked on both sides in black permanent marker U/S and returned to DSDC Bicester for disposal. If there is no grinding or flex continue to stage 2.
- b. **Stage 2 – Ceramic Cracking.** Visually and physically inspect the front and back of the plate. If bumps or cracks are found the plate is unserviceable and must not be used. The item is to be marked on both sides in black permanent marker U/S and returned to DSDC Bicester for disposal. If there are no bumps or cracks continue to stage 3.
- c. **Stage 3 – Visual Imperfections.** If imperfections are found (see Fig 1-38) the plate is to be returned as E0 stock for refurbishment. If there are no imperfections and stages 1 and 2 have been passed the plate can be returned as A1 stock or issued for use. Inspection complete.

1-229 *Explain and demonstrate:* Osprey Plate Inspection is to be conducted using the following process:

- a. Feel the front of the plate for debris and/or damage.
- b. Visually check the outer green fabric for rips and tears.
- c. Visually check the faces of the plate for cracks or damage.
- d. Cracks will be highlighted by a definite white line. Impacts will be visible as a white indentation and radiating fractures.
- e. Damaged or cracked plates MUST be replaced.
- f. Minor blemishes or air pockets do not pose any risk

## Conclusion

1-230 **End of Lesson Drills.**

1-231 *Questions from the squad on the entire lesson.*

1-232 *Confirm by questions and practice configuring the STV to VIRTUS Dress State 4.*

1-233 *Summary. To include:*

- (1) Correct use of the Extremities Protection to enhance protection if the threat level increases.
- (2) How to use the Hydration Subsystem.
- (3) How to maintain the VIRTUS system and inspection of ballistic plates.



Fig 1-38. Examples of ECBA Plate Damage

## Chapter 2

### Practice Periods

#### Introduction

##### General

2-01 All training must be progressive; unnecessary repetition is poor instructional practice. Soldiers learn skills and facts in the basic lessons which should be taught only once during their service. Soldiers then need lots of practice in which to speed up their actions and establish the facts firmly in the mind.

2-02 The proposed sequence for each stage of a practice period is:

- a. REMIND — By explanation.
- b. ASSESS WEAKNESSES — By practice or test.
- c. IMPROVE ON WEAKNESSES — By practice.
- d. PROGRESSIVE PRACTICE — By competitions.

2-03 The practice periods in this pamphlet are intended as a guide to the best way of exercising soldiers during their basic training. The instructor should plan the period on an assessment of the soldiers' weak points.

2-04 Faults should be immediately brought to the notice of the soldiers and corrected, otherwise they will go on making the same mistakes.

2-05 It may become obvious during a practice period that the soldiers have failed to grasp a particular skill or fact. The instructor will, therefore, have to teach that part of the basic lesson again.

##### Competition

2-06 The incentive of competition will always help to make practice more interesting. The whole of a practice period can be based on competitions if the instructor so wishes. Some points on framing competitions are:

- a. They may be on an individual or on a team basis.
- b. If run on a team basis the instructor must ensure that the selected teams are all fairly equal as regards performance. The more advanced members of the team will help bring along the weaker members.
- c. Marks can be awarded up to a given total, or a total started with and marks deducted for mistakes as the competition progresses.
- d. A chart drawn on a chalkboard or a sheet of paper on which to mark up results should always be used.

- e. Further interest can always be attained by making one team or individual watch another, criticising and awarding or deducting marks.
- f. Above all the instructor must make certain that competitions are simple and realistic, i.e. that they exercise the soldiers in the facts and skills concerning their training.

## **Master and Pupil**

2-07 The master and pupil method of practice in its simplest form is for one soldier (the pupil) to work under the supervision of another (the master); the instructor supervises both.

2-08 It stimulates interest, keenness and attention to detail at all stages of training. It is particularly useful with large squads and in competitions. Used regularly, it also develops initiative and leadership and potential leaders may well be discovered by watching the masters at work.

## **Night and CBRN Training**

2-09 Practice periods may be repeated at night or in darkness. They may also be carried out by trained soldiers in CBRN Conditions.

2-10 – 2-19. Reserved.

## Practice 1. Scaling of CPE Dress States

2-20 **Aim.** To practice:

- a. The soldiers understanding of the different dress states.
- b. Practice the soldiers ability to scale the STV to the appropriate dress state.

2-21 **Method.** 1 x 40 minute period.

2-22 **Stores.**

VIRTUS system complete with NPTP and ECBA plates, SAF and Extremities subsystem complete

2-23 **Preparation.** Begin with the system laid out in front of the soldier.

### Preliminaries

2-24 Use power point or have a reference card for the CPE dress states.

### Introduction

2-25 The threat from HE, small arms and IEDs will be a constant threat on the battlefield. The nature of the threat will vary and as a result the level of CPE is likely to change throughout the duration of a deployment or operation. Soldiers will need to understand the different dress states and be able to switch between them to ensure that they adhere to the correct levels of ballistic protection to maximise the balance between protection and manoeuvrability.

### Suggested Practices

2-26 **Scaling CPE Dress State 2 - 2B.** Practice the students in scaling the STV into the plate carrier configuration and fitting the NPTP and ECBA plates.

2-27 **Scaling CPE Dress State 3 – 3C.** Practice the students in scaling the STV into a body armour vest and the fitting of NPTP and ECBA plates.

2-28 **Scaling CPE Dress State 4 and use of Pelvic Protection.** Practice the students in dress state 4 and the attachment of pelvic protection.

### Final Practice

2-29 **As a Competition.** As a final practice allocate different dress states to individuals then ask the students to identify the level of protection and identify any mistakes.

## Conclusion

### 2-30 End of Lesson Drill.

- a. *Questions from the squad on the entire lesson.*
- b. *Pack kit.*
- c. *Summary. To include:*
  - (1) The importance of understanding and dressing to the correct levels of CPE.

2-31 - 2-39. Reserved.

## Practice 2. Use Of DWD and Load Carriage

2-40 **Aim.** *To practice:*

- a. *The donning and adjustment of day sacks and bergens.*
- b. *Operation of the DWD.*
- c. *Distributing load between shoulders and hips.*

2-41 **Method.** *A physical demonstration and practice in the form of a relatively short physical exertion (1.5 or 2 mile run or series of military exercises wearing the STV) to significantly increase the body temperature and cardio vascular effort. Followed by a march with load over 3 miles in distance over difficult or steep terrain to practice distributing the load.*

2-42 **Stores.**

*VIRTUS MOLLE Belt and pouches complete  
VIRTUS day sack loaded  
STV Dress State 3b  
Vehicle and medical cover*

2-43 **Preparation.**

- a. *Load and check the weight of each soldier.*
- b. *Start with the STV worn with DWD attached.*

2-44 **Preliminaries**

2-45 *This is only a suggested method of practice and confirmation. Units are strongly advised to identify and conduct their own practice periods to familiarise a soldiers in the benefits and the use of the STV and VIRTUS system. This could include section attacks or obstacle crossings for the first phase and may include longer marches than suggested.*

2-46 *Soldiers are likely to be sceptical and not appreciate the benefits provided by VIRTUS until they understand and feel the benefits for themselves. Therefore the following physical activities should not to be conducted as a test but rather used to practice. The pace of the physical activities should be enforced but at the same time soldiers should be encouraged to (if necessary) stop and ventilate the system and practice distribution of the load with the DWD.*

## Introduction

2-47 Use of the VIRTUS design features will help ensure that the operational performance of the soldier is maximised whilst undergoing intense physical activity. This can only be achieved if day sacks and bergens are worn correctly, the DWD is utilised and the load constantly distributed. This is a culture change and will require practice and require supervision and encouragement by commanders at all levels to realise.

## Suggested Practices

2-48 Short Physical Exertion. In VIRTUS dress state 3b conduct an intense physical activity or exercise (1.5 or 2 mile run or series of military exercises) to significantly increase the body temperature and cardio vascular effort. Followed by a march with load over 3 miles in distance navigating difficult or steep terrain to practice distributing the load.

## Conclusion

2-49 **End of Lesson Drill.**

- a. *Questions from the squad on the entire lesson.*
- b. *Pack kit.*
- c. *Summary. To include:*
  - (1) The importance of practicing using the DWD and regularly distributing the load.

## Chapter 3

# Additional Information for Use of the VIRTUS System

### Section 1. VIRTUS Dress States and Use Guidance

#### General

3-01 Concept of Use (CONUSE) advises the ODH or commanders of the different Dress States depending on threat levels. The tables below show the various different dress states and informs the level of protection:

Dress State	Equipment Worn	Protection Afforded	Use Guidance
State 1	Chassis with Load Carriage only	No physical protection	For use in extremes of temperature and permissive Ops environments
State 2	Plate Carrier with ECBA plates front back	Ballistic protection of heart but not from the sides	Low IED and ballistic threat. Useful in warm environments where the tempo of operations is high
State 2a	Plate Carrier with OSPREY plates front and back	Ballistic protection front and back of vital organs but not from the sides.	Low IED and High Ballistic threat. Useful in warm environments where the tempo of operations is high
State 2b	Plate Carrier with OSPREY plates front and back, and sides plates fitted	Ballistic protection from the front and back of vital organs and some protection from the sides	Low IED and High Ballistic threat. Useful in warm environments where the tempo of operations is high
State 3	Body Armour with full coverage SAF including integrated neck protection.	Fragmentation protection around full Body Armour covered area. No ballistic protection.	High IED threat with no ballistic threat. (ie. A low intensity Peace Support Operation with a UXO threat).
State 3a	Body Armour with full coverage SAF and ECBA Plates fitted.	Fragmentation protection around full Body Armour covered area and ballistic protection of the heart.	High IED threat and low ballistic threat.

<b>Dress State</b>	<b>Equipment Worn</b>	<b>Protection Afforded</b>	<b>Use Guidance</b>
State 3b	Body Armour with full coverage SAF and OSPREY Plates fitted	Fragmentation protection around full Body Armour covered area and ballistic protection of vital organs	High IED and High Ballistic threat
State 3c	Body Armour with full coverage SAF and OSPREY Plates fitted front and rear and side plates fitted	Fragmentation protection around full Body Armour covered area and ballistic protection of vital organs including some side protection	High IED and High Ballistic threat with a risk attack from the flanks. This may include top cover in vehicles or in sangars
State 4	Body Armour with full coverage SAF and OSPREY Plates fitted front and rear, side plates fitted and extremity protection	Fragmentation protection around full Body Armour covered area, shoulders, upper arms and neck, and ballistic protection of vital organs including some side protection	Very high IED and High Ballistic threat with a risk attack from the flanks. This may include top cover in vehicles or in sangars
Pelvic Protection	Three tiers of protection that are interoperable with any of the above Dress States	Fragmentation protection of the groin and inner thigh areas. No ballistic protection	Very High ground/underground based IED threat

Table 1. Torso Subsystem CPE Dress States

<b>Dress State</b>	<b>Equipment Worn</b>	<b>Protection Afforded</b>	<b>Use Guidance</b>
State 1	Regimental Headdress, Soft headwear (Jungle hats etc) only, Helmet protection to be accessible.	No physical protection	For use in extremes of temperature and permissive Ops environments.
State 2	Helmet Only	Fragmentation and bump protection of the head only.	No IED or frag threat but some risk of head impact (ie. low threat urban environment).
State 2a	Helmet plus Low Impact Eyewear Spectacles	Fragmentation protection of the head, low protection of the eyes and bump protection of the head.	Low IED/ frag threat
State 2b	Helmet plus Medium Impact Eyewear Goggles	Fragmentation protection of the head, medium protection of the eyes and bump protection of the head.	Medium IED/ frag threat, excessive dust or sandstorm.
State 3	Helmet plus Visor and Mandible Guard	Fragmentation and bump protection of the head, eyes and face.	High IED/ frag threat. Useful for sedentary tasks (ie. Top Cover, LTMP Dvr, Sanger Duty).

Table 2. Head Subsystem CPE States

## Section 2. DCC Load Carriage

### General

3-02 The following tables detail the equipment carried and the weights to enable commanders to estimate accurately the soldiers' load and burden as per fight light doctrine.

3-03 On the man (Able to survive against the elements, CBRN and HE & SA).

Ser	Equipment	Category	Weight (kg)
1	Helmet (VIRTUS) 2.32		1.42
2	VIRTUS Torso subsystem (inc ECBA Plates @1.16kg ea) (4.987) + Load Carriage (ex-day sack & bergen) (2.262)		7.249
3	Ballistic Eye Protection		0.048
4	THPS		0.1
5	Combat gloves		0.082
6	Knee pads		0.296
7	Respirator & carrier		1.22
8	Spare canister		0.225
9	DKP No 1 Mk 1		0.105
10	3 x Autoject (combopen)		0.1
11	CBRN Suit (inc boots and gloves)		3.06
12	Underwear and socks		0.075
13	MTP jacket, trousers, smock,		2.4
14	Boots		1.089
15	Headover		0.036
16	Clasp Knife/Multi-tool		0.315
17	FFD/CAT/Morphine		0.192
18	Matches	Sust	0.01
19	ID discs	Sust	0.02
20	Snack pack	Sust	0.5
21	Compass (Silva)	CBM	0.038
22	Notebook & pencil/permanent pen		0.15
23	Watch		0.039
24	Whistle		0.2
25	Map		0.17
Total weight			14.429 (CBRN 4.71 extra) (OSPREY Plates 4.88 extra)

3-04 **Assault Order.** (Able to operate in close proximity to the enemy that may involve dismounted close combat).

Ser	Equipment	Category	Weight (kg)
1	Personal weapon (SA80 A2) & sling	Leth	4.628
2	Laser Light Module (LLM)		0.208
3	4 x Magazines (SA80)		2.44
4	Grenades (1 x HE + 1 x Phos)		0.83
5	Bayonet & scabbard (where it can be fitted to the weapon)		0.3
6	Speed loader		0.028
7	Combination tool, pull through, oil bottle & flannelette		0.15
8	HMNVS	STA	0.45
9	CWS / FTS (weight based on FTS 1)	STA	1.27
10	Water Bottle/hydration system	Sust	1.299
11	Sandbag	Sust	0.43
12	PRR	CBM	0.519
Total additional weight			12.552

**3-05 Patrol Order.** (Able to sustain dismounted operations for 24-hrs without routine resupply).

Ser	Equipment	Category	Weight (kg)
1	Waterproof suit	Surv/PPE	0.98
2	Thermal Trousers (Softie)		1.2
3	Thermal Jacket (Softie)		0.8
4	Hat ECW	Leth	0.116
5	Bandolier (150 x 5.56mm)		2.065
6	50 x 7.62mm Link		1.383
7	Remainder of Weapon Maintenance Kit	STA	0.315
8	CWS / FTS (if not on wpn) – weight captured in Asslt Order		0
9	HMNVs (if not worn) – weight captured in Asslt Oder		0
10	2 <sup>nd</sup> Water Bottle	Sust	1.299
11	24-hr ration		2.100
12	Metal mug		0.131
13	Spoon		0.050
14	Hexamine cooker		0.386
15	Cyalume		0.022
16	ETH		1.34
17	Torch		0.096
18	Insect repellent	CBM	0.75
19	Day sack		2.63
20	AATAM /Report & orders cards		0.360
21	Protractor		0.036
22	30m Paracord		0.2
<b>Total additional weight</b>			<b>16.259</b>

**3-06 Marching Order.** (Able to conduct sustained dismounted operations for periods greater than 24-hours with routine resupply).

Ser	Equipment	Category	Weight (kg)
1	Sleeping Bag		3.500
2	Roll Mat		0.600
3	Bivvie bag		0.860
4	Shelter (sheet, pegs, bungees)		1.171
5	Thermal underwear		0.6
6	Spare trousers		0.450
7	Spare shirt		0.476
8	Spare socks		0.431
9	Foot powder		0.250
10	Washing and shaving kit		0.565
11	Housewife		0.032
12	Boot cleaning kit		0.165
13	Towel		0.411
14	2 <sup>nd</sup> x 24 hr ration pack		2.1
15	Mess tin		0.396
16	Trainers		0.725
19	Bergen		3.44
<b>Total additional weight</b>			<b>16.172</b>

Load	Total Weight (kg)	
On the Man	14.429kg (19.139 with CBRN)	19.309 with Osprey plates (24.019 with CBRN)
Assault Order	026.981kg (31.691 with CBRN)	31.861 with Osprey plates (36.571 with CBRN)
Patrol Order	0(47.94 with CBRN)	48.12 with Osprey plates (52.83 with CBRN)
Marching Order	59.412kg (64.122 with CBRN)	64.292 with Osprey plates (69.002 with CBRN)



## **Destruction Drills**

1. If on active service it is necessary to destroy weapons to prevent them being used by the enemy the following actions will prove effective:
  - a. Plug the barrel near the chamber or bury the muzzle in the ground; load and fire the weapon, by using string tied to the trigger, from behind cover.
  - b. Strip the weapon as far as possible; bury parts or scatter over as wide an area as possible.
  - c. Retain essential parts of the mechanism, such as usable firing pins, etc.
  - d. All spare parts should be disposed of.
2. Should the foregoing destruction drills not be possible, other methods must be devised, e.g, destroying by explosive charges or by fire; running over by vehicles; scattering components in rivers and undergrowth.
3. Unfired ammunition can be destroyed by explosives using improvised demolition charges made with grenades, bombs, etc.

Handling Instructions: For MOD Use Only

© Crown Copyright

The sponsor of this publication is:

Combat Publications

HQ Infantry

Waterloo Lines

WARMINSTER

Wiltshire

BA12 0DJ



BAeBB Online

Civ: 01985 222325

Mil: 94381 2325

Email: ArmyCap-GM-Cbt-Pubs-Mailbox@mod.gov.uk

AC: 72064