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**GOGGLES, IMAGE INTENSIFIED,
GENERAL PURPOSE
CASED L1A2**

PURPOSE AND PLANNING INFORMATION

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BY COMMAND OF THE DEFENCE COUNCIL

Ministry of Defence

ARMY TECHNICAL SUPPORT AGENCY
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AMENDMENT RECORD

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PREFACE

Sponsor :

LSOR 1

INTRODUCTION

1 Service users should forward any comments on this publication through the channels prescribed in AESP 0100-P-011-013.

2 The subject matter of this publication may be affected by Defence Council Instructions (DCIs). If possible amendments are issued to correct this publication accordingly. When an instruction contradicts any portion of this publication the instruction is to be taken as the overriding authority.

RELATED PUBLICATIONS

3 The general purpose passive night vision goggle Equipment octad 5855-G-100 consists of the publications shown in the following Table.

CATEGORIES AND INFORMATION LEVELS														
Category	1	2	3	4		5				6	7		8	
Level				1	2	1	2	3	4		1	2	1	2
1	101	201	201	*	*	201	201	*	*	*	711	*	*	*
2	*	*	*	*	*	*	*	*	*	*	*	*	*	*
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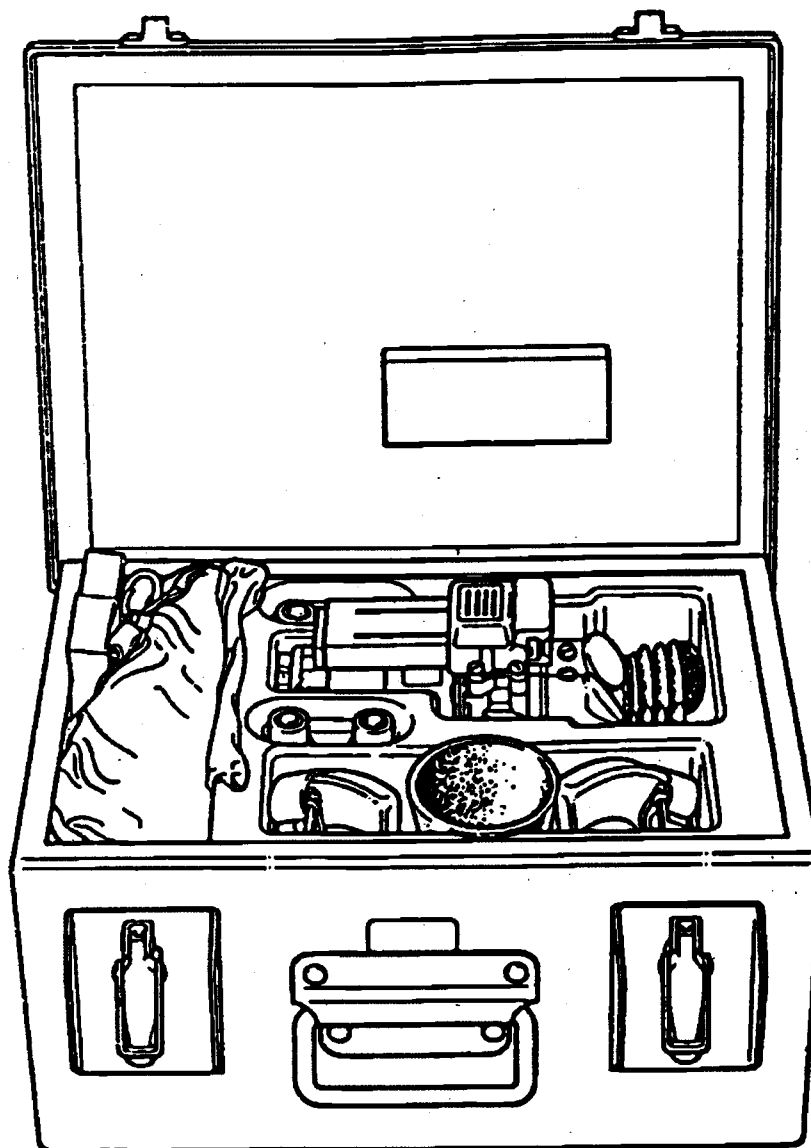
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2.0 Operating Information
3.0 Technical Description
4.1 Installation Instructions
4.2 Prep for Special Environments
5.1 Fault diagnosis
5.2 Repair Instructions

5.3 Inspection Standard
5.4 Calibration Procedures
6.0 Maintenance Schedules
7.1 Illustrated Parts Catalogue
7.2 Commercial Parts List
8.1 Modification Instructions
8.2 General Instructions

* Not published

NOTE

References to AESP 0100-A-001-001 must be made to ensure the availability of the listed publications.



GPG/001

General purpose passive night goggles with transit case

EQUIPMENT IDENTITY

1	Management Code	Z7
	NATO Stock No	5855-99-966-6811
	Item name	Goggles, image intensified, general purpose, cased L1A2

WARNINGS

- 2 (1) **TOXIC GASES.** THESE BATTERIES ARE CAPABLE OF GENERATING TOXIC GASES AT HIGH PRESSURE AND MAY BURST IF THEY ARE SUBJECT TO EXCESSIVE HEAT, SHORT CIRCUIT OR IF DISCHARGED WELL BEYOND THEIR NORMAL WORKING LIFE.
- (2) **DISCHARGED BATTERIES.** BATTERIES WHICH HAVE BEEN DISCHARGED SO THAT THEY WILL NO LONGER OPERATE MUST BE PROMPTLY REMOVED AND RETURNED TO STORES. THEY MUST NOT BE BURIED, BURNED, PLACED ON A FIRE, OR PLACED IN ANY RECEPTACLE SUPPLIED FOR ANY OTHER WASTE.
- (3) **PERSONNEL HAZARD.** LITHIUM BATTERIES MUST NOT BE OPENED.
- (4) **BATTERY DISPOSAL.** UNSERVICEABLE BATTERIES MUST BE RETURNED THROUGH STORES CHANNELS FOR DISPOSAL. THEY MUST BE SO PACKED AS TO PREVENT ACCIDENTAL SHORT CIRCUITING. THE PACKAGE AND ACCOMPANYING CORRESPONDENCE MUST BE CLEARLY MARKED 'UNSERVICEABLE LITHIUM BATTERIES FOR DISPOSAL'.

CAUTIONS

- 3 (1) **SEALED INSTRUMENT.** The user must not tamper with or strip the equipment other than as detailed in Chapter 3 of 5855-G-100-201.
- (2) **CLEANING DAMAGE.** Dirt or moisture entering the instrument will badly affect performance. Great care must be taken, when cleaning, to avoid scratches to the glass surfaces. Never attempt to wipe off mud or grit in a dry condition. Do not use petroleum spirit to clean glass surfaces.

(3) **BRIGHT LIGHT.** The photocathode of the Image Intensifier Tube (IIT) may be damaged if bright light, either natural or artificial is allowed to enter the objective system. In daylight and when the equipment is not in use the Neutral Density (ND) filter must be fitted.

(4) **BATTERY LIFE.** Continuous use of the Infra-red light will reduce the life of the battery.

(5) **LIGHT SOURCE.** Inadvertently switching on of the Infra-red light source could reveal the position of the operator to an enemy.

(6) **EQUIPMENT DAMAGE.** Lithium batteries used in this equipment must not be recharged.

ROLE AND PURPOSE

4 The goggles are designed for general night vision use. They are lightweight and can be hand-held or head mounted.

5 They provide both eyes with night vision capability to see objects clearly in conditions equivalent to quarter moonlight (10^{-2} Lux) when meteorological visibility is not less than 2000 m. They are fitted with an infra-red emitting device to assist in close order tasks.

6 The goggles are compatible with nuclear, biological and chemical attack equipment, including the S10 respirator, military spectacles and service helmets.

BRIEF DESCRIPTION

7 The goggles consist of six parts; the objective, tube housing, collimator, two eyepieces, and headmount interface. The objective can be rotated to adjust the focus; it focuses the image onto the front face of an Image Intensifier Tube (IIT). The IIT produces a bright picture on its back face which is viewed through the two eyepieces.

8 The eyepieces are adjustable, by the User, for different Users' eye separations. An infra-red light is fitted to assist in map reading and other close work, when this is turned on, a red warning light appears in the Users field of view.

9 The goggles may be used fitted to the head mount or hand held or, if not in use, can be hung around the neck or stored in the belt mounted pouch.

10 The goggles are supplied complete with transit case, carrying pouch, headmount, cleaning cloth, anti mist tissues, lens hood, and User instructions and lithium batteries.

PHYSICAL DATA

11	Length	Height	Width	Weight
Goggles	150 mm (5.9 in)	90 mm (3.5 in)	100 mm (3.9 in)	620 g (1.4 lb)
Goggles and headmount	190 mm (7.5 in)	150 mm (5.9 in)	180 mm (7.1 in)	900 g (2.0 lb)
Equipment in transit case	352 mm (13.8 in)	168 mm (6.6 in)	286 mm (11.3 in)	4600 g (10.1 lb)

PERFORMANCE

12 Range: Resolves a battle tank head on at 300 m (1000 ft) in quarter moonlight with 50% contrast.

Magnification: Unity, over full field of view.

Field of vision: 711 mils (40 deg.)

Eyepiece: Preset within the range -1.5 diopetre to -2.1 diopetre.

Focus range: 400 mm to infinity.

ENVIRONMENTAL DATA

13 Operational temperature range: -31 deg C to +44 deg C

Storage temperature range: -33 deg C to +63 deg C stored in transit case in building

Relative humidity: Up to 95%

TRANSPORTATION DATA

14 No limitations are applicable when transporting this equipment.

POWER REQUIREMENTS**15**

- | | | |
|------|---------------------|---|
| 15.1 | Supply voltage | The battery is a 3.0 V lithium battery, eg DSB Special Batteries NSN; Y3/6135-99-774-5711 |
| 15.2 | Battery life | At 23 deg C, using the IIT only, the battery life will be approx 80 hours. Using the infra-red light source for 8% of the operating time, battery life will be approx 50 hours. |
| 15.3 | Current consumption | IIT operating; 15 mA
IIT and infra-red light source operating; 120 mA |

MAINTENANCE

16 The repair policy for User maintenance is fully detailed in AESP 5855-G-100-201 and is limited to:

- Battery replacement
- Exterior cleaning
- Replacement of rubber eye cups
- Replacement of strap assembly
- Replacement of ND filter

17 Maintenance and repair apart from that listed in paragraph 16 will be carried out at Field repair level. Repair policy level is restricted to replacement assemblies and sub assemblies.

PRINTING HISTORY

AESP 5855-G-100-101

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**GOGGLES, IMAGE INTENSIFIED,
GENERAL PURPOSE
CASED L1A2**

OPERATING INFORMATION

This publication contains information covering the requirements of
Categories 2, 3, 5.1 and 5.2 Level 1

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Issued by:

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OPERATING INFORMATION

Chapters

- 1 Description
- 2 Operating instructions
- 3 User maintenance
- 4 Destruction of equipment

PREFACE

Sponsor: LSOR 1

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RELATED PUBLICATIONS

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WARNINGS

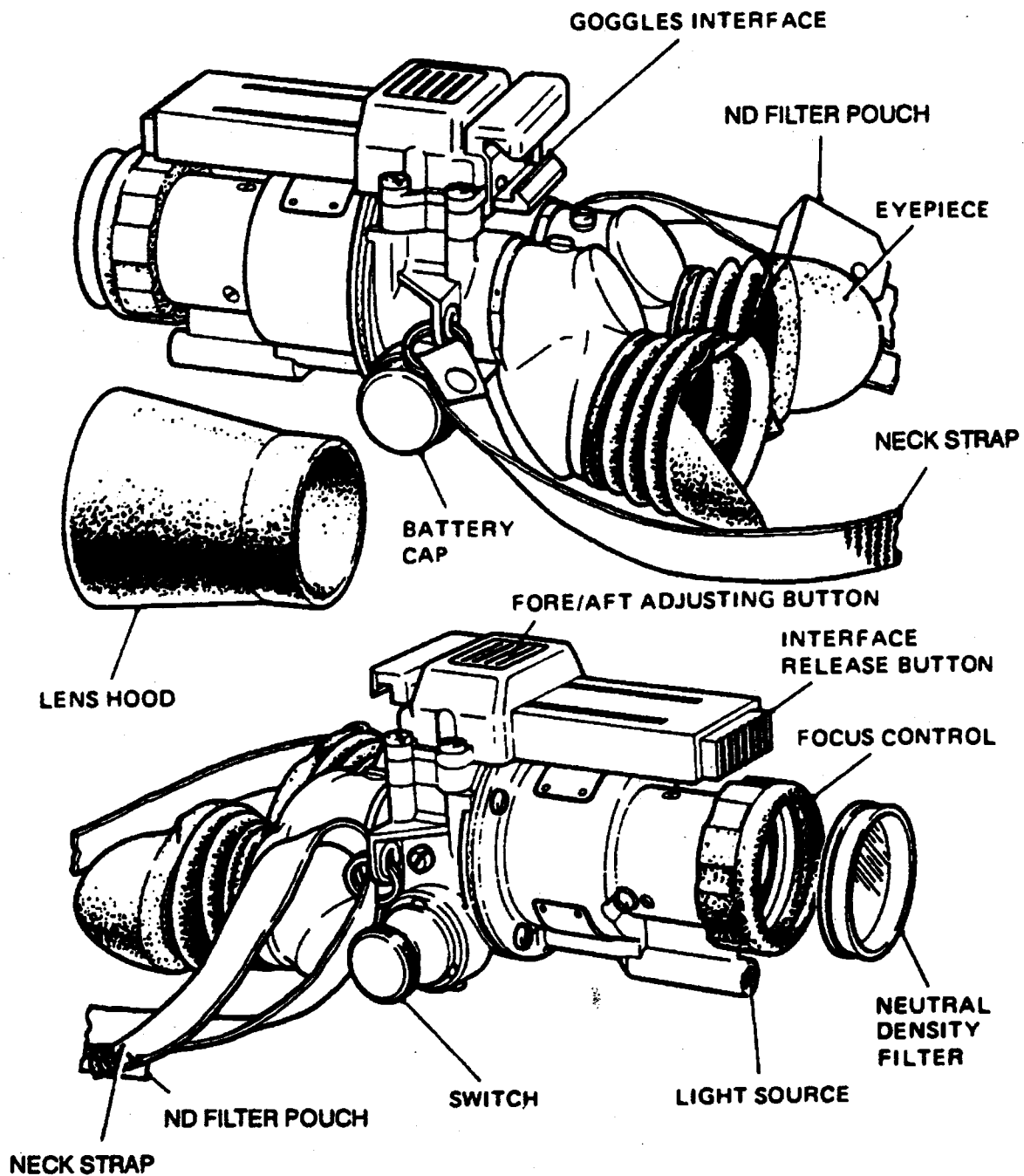
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CAUTIONS

- (1) **SEALED INSTRUMENT.** The user must not tamper with or strip the equipment other than as detailed in Chapter 3.
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- (4) **BATTERY LIFE.** Continuous use of the infra-red light will reduce the life of the battery.
- (5) **LIGHT SOURCE.** Inadvertent switching on of the infra red light source could reveal the position of the operator to an enemy.
- (6) **EQUIPMENT DAMAGE.** Lithium batteries used in this equipment must not be recharged.

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2	Headmount	3
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Fig 1 General purpose passive night vision goggles

DESCRIPTION

GENERAL

1 The equipment consists of two main components, the Goggles (Fig 1) and the Headmount (Fig 2).

2 The headmount has been designed to fit comfortably on the head. The face pad rests on the face and is secured in position by adjusting the five straps between the face pad and the skull cap. The skull cap has provision for the attachment of a counterbalance weight.

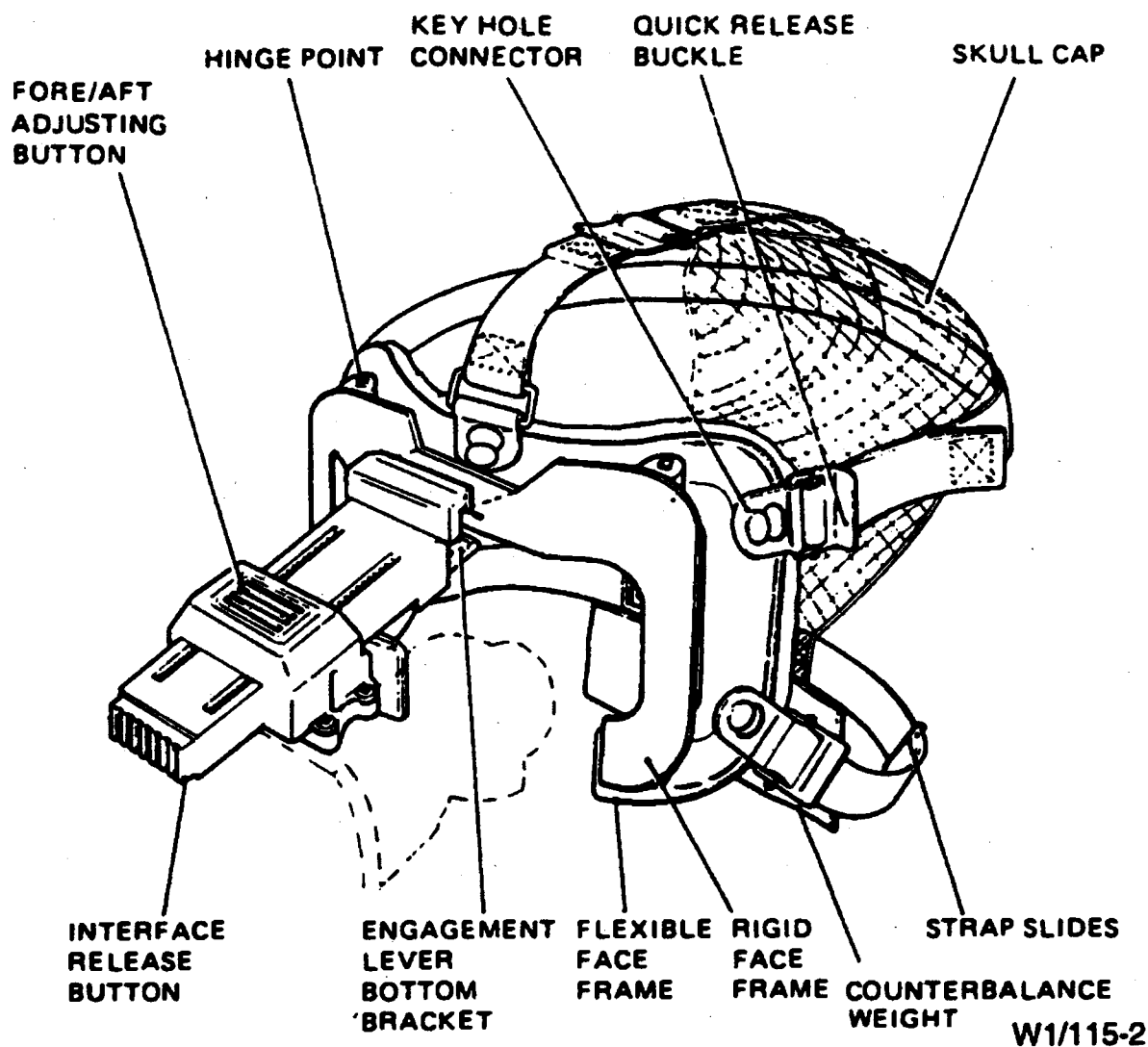
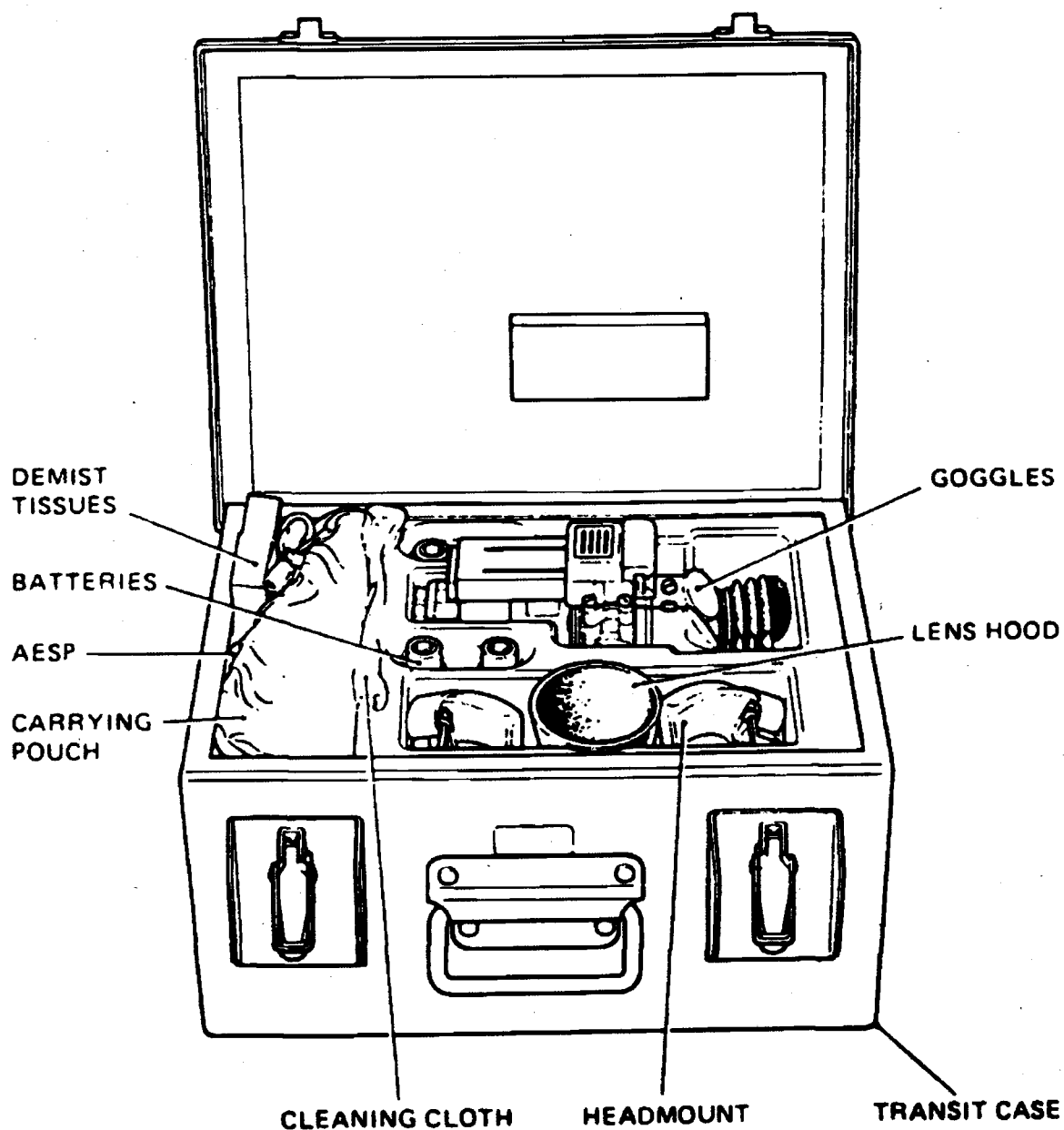


Fig 2 Headmount



W1/115-3

Fig 3 Complete equipment cased

3 The equipment may be used together with the following service equipment:

- 3.1 AFV crewmans helmet.**
- 3.2 General service Mk VI helmet.**
- 3.3 S10 respirator.**
- 3.4 Nuclear, biological and chemical warfare suit.**
- 3.5 Nuclear, biological and chemical warfare facelet mask.**
- 3.6 Military spectacles.**

4 The goggles, together with the headmount, pouch, counterbalance weight, carrying strap and filter pouch, cleaning cloth, batteries, ND filter, AESP Category 2 Level 1, demist tissues and lens hood are packed in a transit case (See Fig 3).

5 The goggles are attached to the headmount using a quick release interface which also contains the fore and aft position adjustment. The goggles may be used with the headmount or hand held. A strap and filter pouch is attached for carrying the goggles when not in use and storing the ND filter when removed from the goggle. The sight carrying pouch can be used for protection in the field.

6 The front lens of the goggles focuses light onto the front face of the Image Intensifier Tube (IIT). The IIT then multiplies the light falling on it and forms a bright visible picture on its rear face. This is then viewed by the user through the two eyepieces.

7 The goggles contain an infra red light source which can be turned on for carrying out close order tasks. A small warning light appears in the operators field of view when this is switched on.

PERFORMANCE

8 The operator should resolve a battle tank head on at 300 m (1000 ft) in quarter light with 50% contrast.

9 The field of view is 711 mils (40 deg) and the magnification is unity over the full field of view.

10 The focus range is 400 mm (15.7 in.) to infinity.

CAUTION

BATTERY LIFE. Continuous use of the infra-red light will reduce the life of the battery.

11 The battery life is approximately 80 hrs using IIT only, the battery life is reduced if using the infra red light source.

CHAPTER 2
OPERATING INFORMATION
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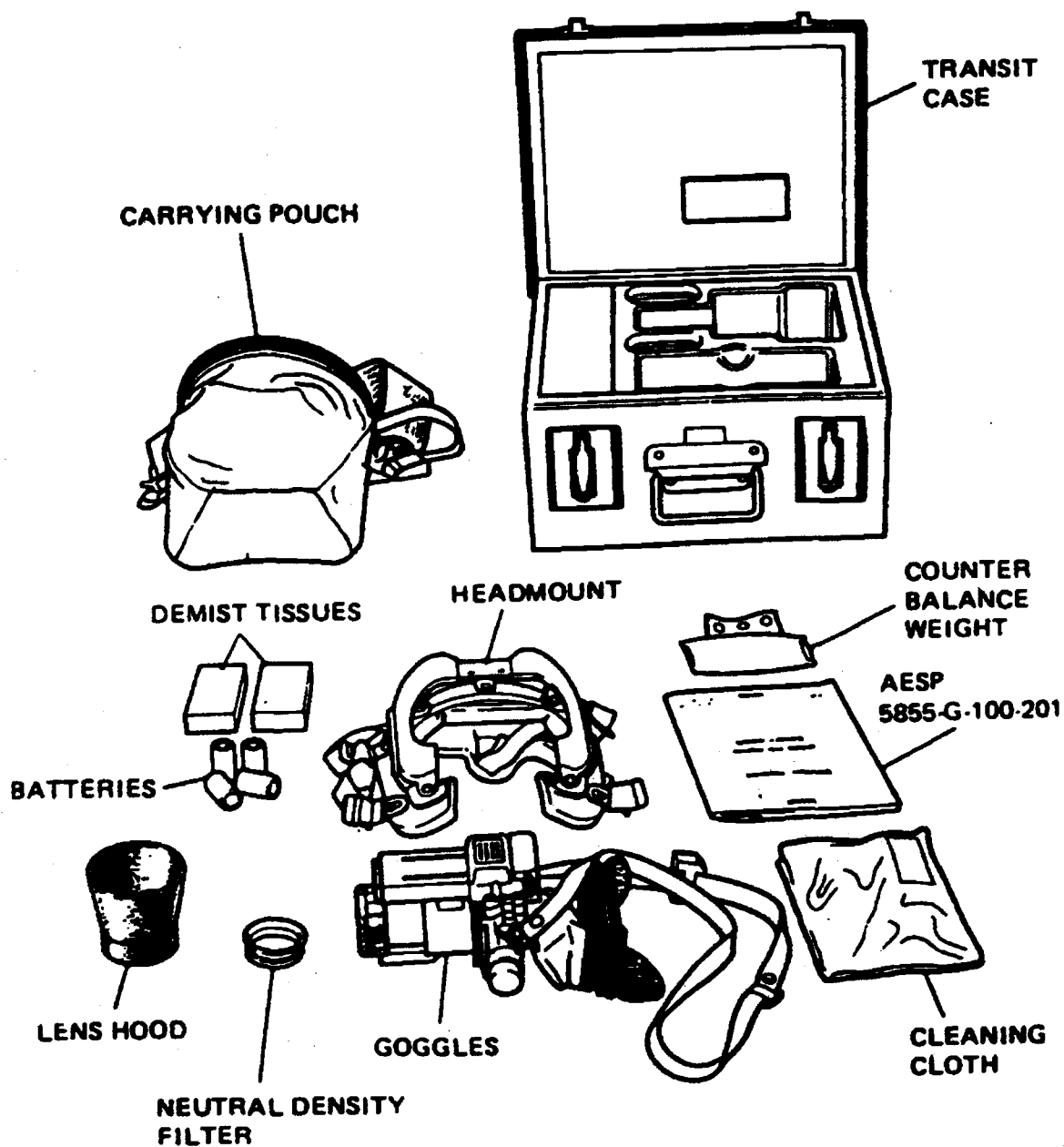
PREPARATION FOR USE AND FUNCTION OF CONTROLS AND INDICATORS

- 1** Initial receipt inspection
- Operation**
- 3** Headmount
- 6** Goggles (WARNINGS) (CAUTION)
- 19** Counterbalance weight
- Repacking of equipment**
- 22** Packing into carrying pouch
- 27** Packing into transit case

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3	Fitting of battery	5
4	Fitting goggles on headmount and switch positions	6
5	Head mounted goggles in use	8



W1/115-4A

Fig 1 Complete equipment

PREPARATION FOR USE AND FUNCTION OF CONTROLS AND INDICATORS

INITIAL RECEIPT INSPECTION

1 Check that the following items are present in the transit case (Fig 1) and that they are free from damage.

Headmount

Goggles

Batteries (x4)

AESP Category 2, Level 1

Cleaning cloth

ND filter

Pouch

Counterbalance weight

Demist tissues (2 packs of 10)

Lens hood

2 Check that the objective lens, the ND filter and the eyepieces are clean; if they are not remove any mud or abrasive dirt by washing with water and cotton wool refer to Chap 3, then clean with Methylated Spirits Industrial 740P H1 6810-99-220-0984, 4oz bottle.

OPERATION

Headmount (Fig 2 Chap 1)

3 Slacken off the five straps and place the skull cap over the head until it rests comfortably over the base of the skull, so that the bottom strap is below the ear. Adjust the top strap until the face pad is resting in its most comfortable position.

4 Tighten the two bottom straps, then tighten the two top side straps.

5 In order to remove the headmount it is only necessary to loosen the two lower straps and slip the headmount up and over the head.

Goggles (Fig 1 Chap 1)**WARNINGS**

(1) **TOXIC GASES.** THESE BATTERIES ARE CAPABLE OF GENERATING TOXIC GASES AT HIGH PRESSURE AND MAY BURST IF THEY ARE SUBJECT TO EXCESSIVE HEAT, SHORT CIRCUIT OR IF DISCHARGED WELL BEYOND THEIR NORMAL WORKING LIFE.

(2) **DISCHARGED BATTERIES.** BATTERIES WHICH HAVE BEEN DISCHARGED SO THAT THEY WILL NO LONGER OPERATE MUST BE PROMPTLY REMOVED AND RETURNED TO STORES. THEY MUST NOT BE BURIED, BURNED, PLACED ON A FIRE, OR PLACED IN ANY RECEPTACLE SUPPLIED FOR ANY OTHER WASTE.

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CAUTIONS

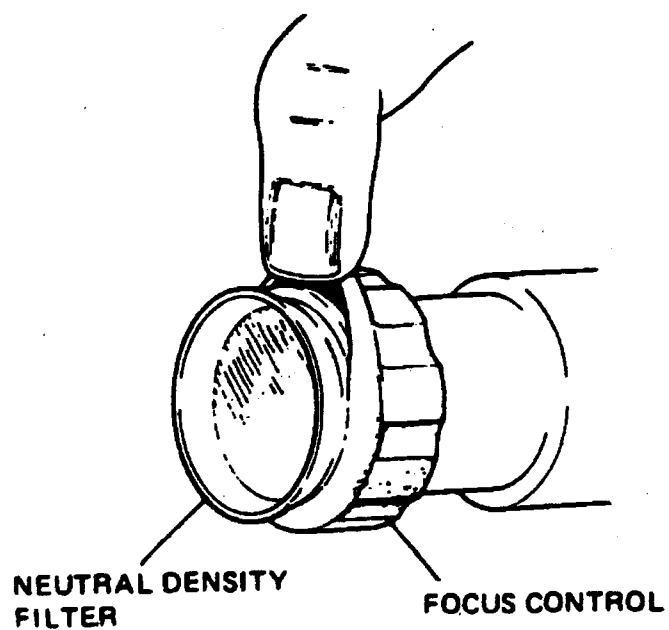
(1) **BRIGHT LIGHT.** The photocathode of the Image Intensifier Tube (IIT) may be damaged if bright light, either natural or artificial is allowed to enter the objective system. In daylight and when the equipment is not in use the Neutral Density (ND) filter must be fitted.

(2) **EQUIPMENT DAMAGE.** Lithium batteries used in this equipment must not be recharged.

6 If the following operation is being carried out in daylight the ND filter must be fitted. If it is being carried out in dark conditions the ND filter must be removed and stowed in the strap pouch. To remove the ND filter, push it forward out of the focus control (Fig 2).

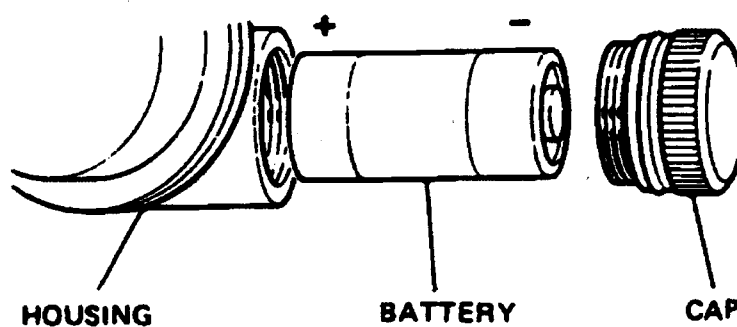
7 Remove the battery cap (Fig 3) and insert a battery with its positive (+) end first into the battery housing; replace the battery cap.

8 Adjust the two eyepieces to obtain the correct eyepiece separation.



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Fig 2 Removal of ND filter



W1/115-6

Fig 3 Fitting of battery

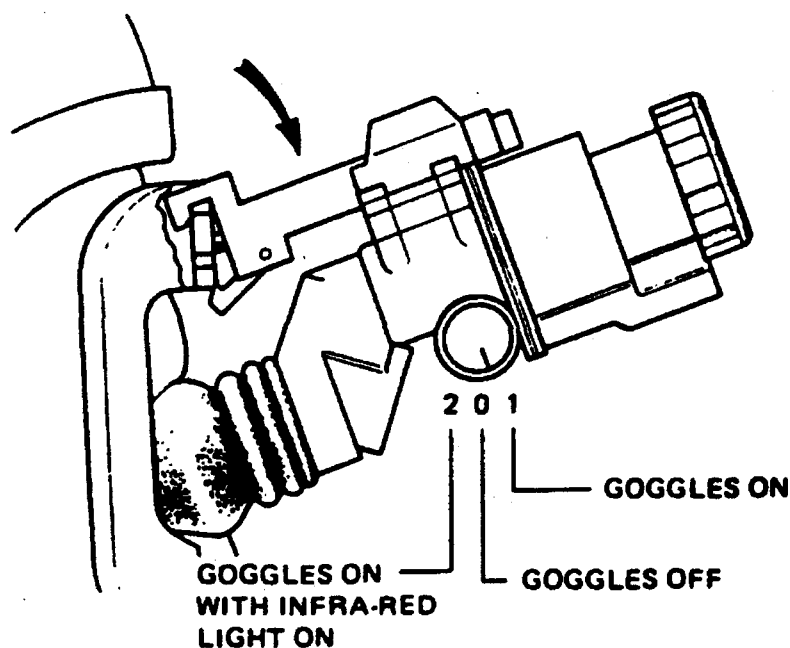
9 Move the goggles to their most forward position on the goggles interface by depressing the fore-aft adjusting button (Fig 1 Chap 1) and moving the goggles forward on the cantilever. Then, holding the goggles at about 30° to the horizontal (Fig 4), clip the hook on the goggles interface over the top of the mounting plate on the front of the headmount interface. Tilt the goggles downwards until the bottom bracket clips securely under the bottom of the headmount interface. Fig 5 shows the goggles mounted on the headmount.

10 It may be necessary to retighten the headmount straps at this stage.

11 Switch on the goggles by turning the switch to Position '1' (Fig 4) this connects the power to the IIT. Adjust the fore and aft adjustment for the best position for comfortable viewing. To bring the scene into focus, rotate the focus control.

12 Certain field conditions may cause the lenses to become misted, this can be cured by wiping the glass surfaces with a demist tissue. The objective lens and the eyepieces should be treated.

13 There is a provision for the attachment of a lens hood. The purpose of this is to reduce the effects of spray, rain etc upon the goggles. The fitting of this is a personal choice depending upon operating conditions, and is a push fit over the objective lens.



W1/115-7

Fig 4 Fitting goggles on headmount and switch position

14 Close order tasks may require additional illumination, to obtain this turn the switch to position '2' (Fig 4) which will connect the power to the image intensifier tube and the infra-red light emitting diode.

15 After use the goggles should be switched off to prolong battery life.

16 The goggles are removed from the headmount by depressing the release button (Fig 4) on the interface and then lifting the front of the goggles so that the hook on top of the interface can clear the headmount. Lift the goggles away from the headmount.

17 The headmount can then be removed as in Para 5.

18 If the goggles are not required for some period of time re-pack them in the carrying pouch.

Counterbalance weight

19 There is a provision at the back of the skull cap for the attachment of a weight. The weight is attached by means of pop-studs.

20 The function of this weight is to act as a counterbalance to the weight of the goggles and hence possibly increase the comfort of using the goggles.

21 The wearing of this weight is a personal choice and if required should be fitted to the skull cap before the cap is fitted onto the User's head.

REPACKING OF EQUIPMENT

Packing Into carrying pouch

22 Remove goggles from the headmount.

23 Remove the lens hood from the goggles, if fitted.

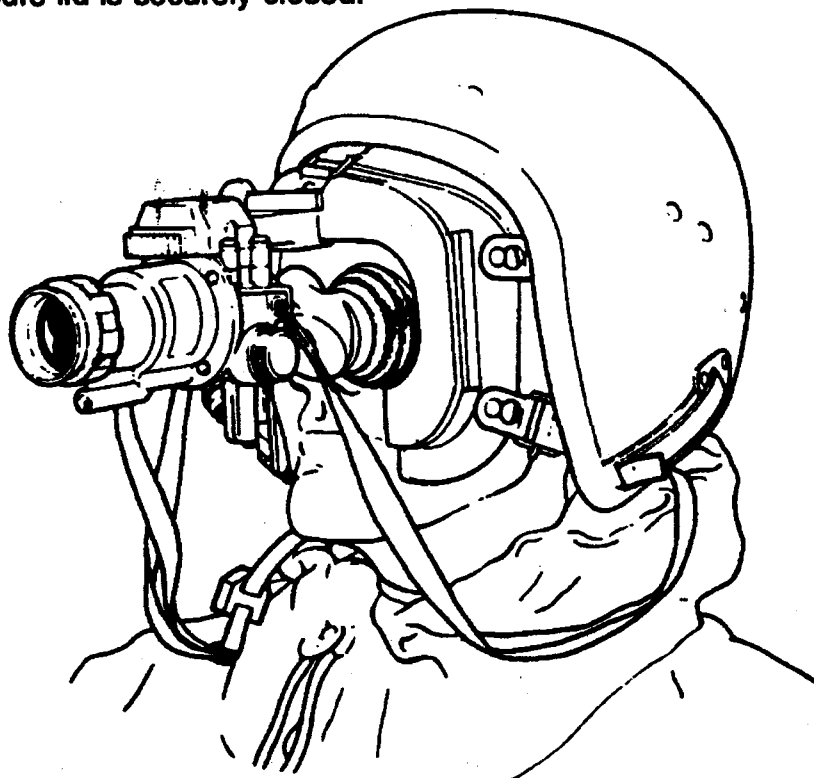
24 Gather the straps and webbing into the face aperture of the face frame and ease into the rear compartment of the pouch, with the face frame towards the back (flat) side of the pouch.

25 Ease the goggles into the front compartment of the pouch, objective lens end first.

26 Put the lens hood into the pouch.

Packing into transit case (Fig 3 Chap 1)

- 27 Remove goggles from the headmount.
- 28 Remove the lens hood from the goggles, if fitted.
- 29 Pack the headmount loosely into the slot, upside down in the transit case.
- 30 Pack the lens hood in the same slot as the headmount in the transit case.
- 31 Remove the battery from the goggles and put the battery into its compartment.
- 32 Put the goggles into the transit case ensuring that the eyepieces are sufficiently far apart so that the goggles will just go into the recess in the case. Press the goggles gently down to the bottom of the recess. Position the strap assembly into the recess around the eyepieces.
- 33 Ease the carrying pouch loosely into its space.
- 34 Put the cleaning cloth and AESP Category 201 in the space next to the pouch. Ensure lid is securely closed.



W1/115-8A

Fig 5 Head mounted goggles in use

CHAPTER 3
USER MAINTENANCE
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- Replacements (WARNINGS)
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- 6 Headmount face pad
- 7 Skull cap
- 9 Strap and filter pouch
- 10 Goggles
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GENERAL**CAUTION**

SEALED INSTRUMENT. The user must not tamper with or strip the equipment other than as detailed in this chapter.

1 The goggles are a sealed instrument and the User must not tamper with nor strip the equipment in excess of the instructions contained in this chapter. Before any user maintenance is carried out refer to Warnings and Cautions in Preliminary pages.

2 User maintenance is limited to the following:

2.1 Cleaning

2.2 Replacement of:

Battery

Headmount face frame

Headmount face pad

Skull cap

Strap and filter pouch

Goggles

ND filter

Carrying pouch

Transit case

Demist tissues

Lens hood

CLEANING

CAUTION

CLEANING DAMAGE. Dirt or moisture entering the instrument will badly affect performance. Great care must be taken, when cleaning, to avoid scratches to the glass surfaces. Never attempt to wipe off mud or grit in a dry condition. Do not use petroleum spirit to clean glass surfaces.

3 Dust on the glass surfaces should be removed with a soft brush. If there is mud or grit on the ND filter or the objective lens it should be removed by rinsing with plenty of clean water until free of dirt. They may then be wiped with a skin, Chamois Leather, dampened or a cleaning cloth, taking care not to trap abrasive matter between the leather and the glass. Soap or detergent may not be used to remove greasy stains or smears. Lightly polish the glass surfaces with a dry cleaning cloth.

REPLACEMENTS

WARNINGS

(1) **DISCHARGED BATTERIES.** BATTERIES WHICH HAVE BEEN DISCHARGED SO THAT THEY WILL NO LONGER OPERATE MUST BE PROMPTLY REMOVED AND RETURNED TO STORES. THEY MUST NOT BE BURIED, BURNED, PLACED ON A FIRE, OR PLACED IN ANY RECEPTACLE SUPPLIED FOR ANY OTHER WASTE.

(2) **BATTERY DISPOSAL.** UNSERVICEABLE BATTERIES MUST BE RETURNED THROUGH STORES CHANNELS FOR DISPOSAL. THEY MUST BE SO PACKED AS TO PREVENT ACCIDENTAL SHORT CIRCUITING. THE PACKAGE AND ACCOMPANYING CORRESPONDENCE MUST BE CLEARLY MARKED 'UNSERVICEABLE LITHIUM BATTERIES FOR DISPOSAL'.

Battery

4 Unscrew the battery cap (Fig 3 Chap 2) and remove the old battery. Insert new battery, positive (+) end first, replace battery cap and screw down fully without using excessive force. Return discharged battery to stores.

Headmount face frame

5 If there is damage to the headmount face frame which causes it to be unserviceable, then the whole headmount face frame assembly must be replaced. This is removed from the skull cap by unclipping the five 'key hole' connectors holding the skull cap to the face frame. The skull cap can be retained and fitted to the new face frame assembly by clipping on the five 'key hole' connectors.

Headmount face pad

6 The face pad can be renewed by prising off the lip of the face pad which wraps around the rear plate of the face frame assembly and pulling the face pad away. The new face pad is fitted by reversing this process.

Skull cap

7 The skull cap is removed from the face frame assembly by unclipping the five 'key hole' connectors from the studs on the face frame assembly.

8 A new skull cap is fitted by clipping the 'key hole' connectors onto the existing face frame assembly.

Strap and pouch assembly

9 The strap and pouch assembly is held onto the goggles by two small key rings. Each end of the strap is removed by opening the gap in the key ring and pushing the strap around the slit in the key ring. The new strap is put on the rings in a similar fashion.

Goggles

10 If there is physical damage to the goggles which causes them to be unserviceable, or any fault develops which cannot be cleared by carrying out the actions in Table 1 then the goggles are to be returned to the repair authority.

ND filter

11 The ND filter is removed by pushing it forward out of the soft rubber focus control (Fig 2 Chap 2). A new filter is installed by pressing it into the groove at the outer end of the focus control.

FAILURE DIAGNOSIS

12 If the following diagnosis, Table 1, is unsuccessful, return the goggles to the repair authority, listing the observed faults.

TABLE 1 FAILURE DIAGNOSIS

Serial (1)	Symptom (2)	Possible Fault (3)	Action (4)
1	Sight fails to produce green glow on rear face of tube.	1 Sight not switched on. 2 Battery not inserted. 3 Battery discharged. 4 Battery inserted wrong way round. 5 Battery terminals dirty.	1 Check. 2 Check. 3 Replace with new battery. 4 Check that the +ve end of the battery is inserted into the goggles first (See Fig 3 Chap 2). 5 Clean terminals.
2	Sight glows green but fails to produce an image	1 ND filter not removed. 2 Optics misted up.	1 Remove if used at night. 2 Wipe front lens surfaces and eyepiece surfaces with demist tissue.
3	Sight fails to focus.	1 Misted up optics.	1 Wipe front lens and eyepiece surfaces with demist tissue.

USER REPLACEABLE ITEMS

13 Items replaceable by the user are tabulated below.

TABLE 2 USER REPLACEABLE ITEMS

Item description	Quantity	Catalogue No.
Battery (Lithium)	1	6135-99-774-5711
Face frame assembly	1	5999-99-966-9350
Pad cushioning	1	5855-99-966-9356
Skull cap	1	5855-99-966-9851
Pouch, filter and strap assembly	1	5855-99-660-2746
ND filter assembly	1	5855-99-966-9849
Carrying pouch	1	5855-99-966-7869
Demist tissues (packs of 10)	2	5855-99-966-9873
Lens hood	1	5855-99-966-9872
Balance weight	1	5855-99-966-9857
Cleaning cloth	1	6640-99-224-7490

**CHAPTER 4
DESTRUCTION OF EQUIPMENT
CONTENTS**

Para

1 Destruction

DESTRUCTION

1 It is essential to deny the enemy the use of equipment which is abandoned in an operational zone or is about to be captured. Methods of destruction should achieve such damage to equipment and essential parts that it would not be possible to restore the equipment to a usable condition at its location either by repair or cannibalisation.

2 Destruction of General Purpose Passive Night Vision Goggles, when subject to capture by the enemy, will be undertaken by the user arms **ONLY WHEN**, in the judgement of the unit commander concerned, such action is necessary in accordance with orders of, or policy established by, the Army or Divisional Commanders.

3 The priority sequence for the destruction of General Purpose Passive Night Vision Goggles equipment is as follows:

3.1 Destruction of the goggles not deployed, are to be carried out by mechanical means eg use of sledge hammer.

3.2 Documentation associated with this equipment should also be destroyed, where possible by burning.



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GOGGLES, IMAGE INTENSIFIED, GENERAL PURPOSE, CAGED L1A2

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4	General
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19	Tube housing
22	Image intensifier tube
23	Collimator assembly
27	Eyepiece
32	Sealing
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WARNINGS

- (1) **TOXIC GASES.** THESE BATTERIES ARE CAPABLE OF GENERATING TOXIC GASES AT HIGH PRESSURE AND MAY BURST IF THEY ARE SUBJECT TO EXCESSIVE HEAT, SHORT CIRCUIT OR IF DISCHARGED WELL BEYOND THEIR NORMAL WORKING LIFE.
- (2) **DISCHARGED BATTERIES.** BATTERIES WHICH HAVE BEEN DISCHARGED SO THAT THEY WILL NO LONGER OPERATE MUST BE PROMPTLY REMOVED AND RETURNED TO STORES. THEY MUST NOT BE BURIED, BURNED, PLACED ON A FIRE, OR PLACED IN ANY RECEPTACLE SUPPLIED FOR ANY OTHER WASTE.
- (3) **PERSONNEL HAZARD.** LITHIUM BATTERIES MUST NOT BE OPENED.
- (4) **BATTERY DISPOSAL.** UNSERVICEABLE BATTERIES MUST BE RETURNED THROUGH STORES CHANNELS FOR DISPOSAL. THEY MUST BE SO PACKED AS TO PREVENT ACCIDENTAL SHORT CIRCUITING. THE PACKAGE AND ACCOMPANYING CORRESPONDENCE MUST BE CLEARLY MARKED 'UNSERVICEABLE LITHIUM BATTERIES FOR DISPOSAL'.
- (5) **HIGH VOLTAGE.** THE IMAGE INTENSIFIER TUBE (IIT) CONTAINED IN THE GOGGLE MAY RETAIN A POTENTIAL OF UP TO 10 KV BETWEEN INPUT AND OUTPUT WINDOWS. THE TUBE ASSEMBLY MUST NOT BE REMOVED UNTIL THE GOGGLES HAVE BEEN SWITCHED OFF FOR AT LEAST 15 MINUTES. WHEN REMOVED THE TUBE ASSEMBLY SHOULD BE HANDLED WITH CARE AND SHOULD NOT BE DISCHARGED BY SHORTING THE TWO TUBE CONTACTS TOGETHER.

CAUTIONS

- (1) **SEALED INSTRUMENT.** The equipment is a sealed instrument and the user must not tamper with, or strip the equipment, in excess of that shown in AESP 5855-G-100-201.
- (2) **CLEANING DAMAGE.** Dirt or moisture entering the equipment will badly affect its performance. Great care must be taken to avoid scratching the glass surfaces during cleaning. No attempt should be made to wipe off mud or grit in a dry state. DO NOT use petroleum spirit to clean glass surfaces.
- (3) **BRIGHT LIGHT.** The photocathode or IIT may be damaged if bright light either natural or artificial, is allowed to enter the objective system. In daylight and when the equipment is not in use the Neutral Density (ND) filter must be fitted.
- (4) **DISCHARGED BATTERIES.** Remove discharged batteries from the equipment and return the batteries to stores. Remove batteries from the equipment before returning to stores; return the batteries to stores.
- (5) **BATTERY LIFE.** Continuous use of the infra-red light source will reduce the life of the battery.
- (6) **LIGHT SOURCE.** Inadvertent switching on of the infra-red light source could reveal the position of an operator to the enemy.
- (7) **EQUIPMENT DAMAGE.** Lithium batteries used in this equipment must not be recharged.

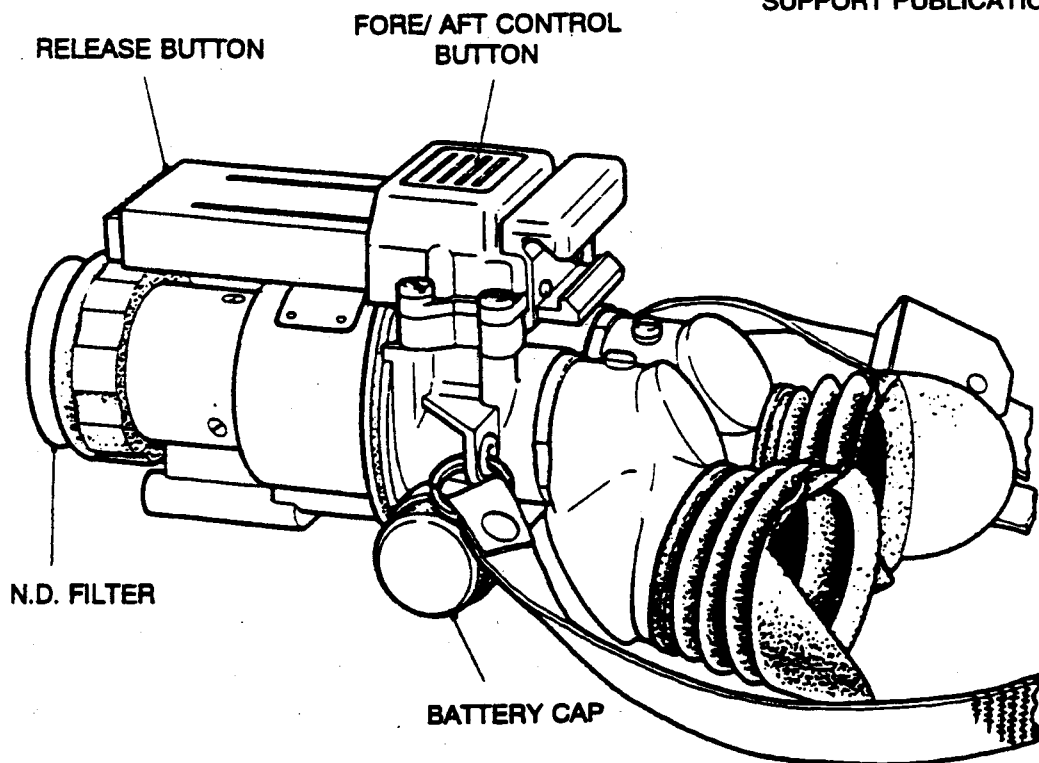
ROLE AND PURPOSE

- 1 The goggles are designed for general night vision use and are a lightweight biocular night vision equipment which can be hand held or head mounted.
- 2 They provide the user with a night vision capability to see clearly in conditions of quarter moonlight, (ambient light level of 10^{-2} Lux). There is a built-in infra red light source to enable the user to carry out close order tasks in total darkness.
- 3 The goggles are compatible with Nuclear, Biological and Chemical (NBC) attack equipment, including the S10 respirator, military spectacles and service helmets.

CONSTRUCTION

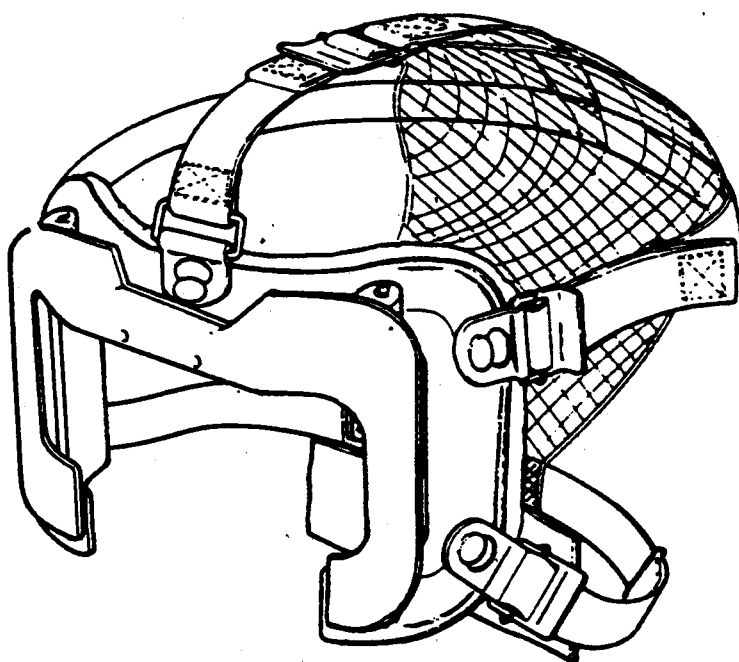
General

- 4 The equipment consists of two main items, the goggles (Fig 1) and the headmount (Fig 2).
- 5 The headmount comprises the face frame, the facepad and the skull cap. The facepad rests on the face and is attached to the skull cap by five straps. There is a provision for the attachment of a counterbalance weight at the rear of the skull cap.
- 6 The goggles are attached to the headmount by a quick-release interface which also contains the fore and aft goggles position adjustment.
- 7 The goggle may be hand held if required and have a neck strap with Neutral Density (ND) filter pouch for carrying when not in use and a belt mounted pouch for stowage.
- 8 The goggles consist of five aluminium alloy housings which form the main sub assemblies (Fig 3); the objective, the tube housing, the collimator and the two eyepieces.
- 9 The objective assembly is mounted in the tube housing. The tube housing is a machined aluminium alloy casting which houses the Image Intensifier Tube (IIT) and the Infra Red Light Emitting Diode (IRLED).
- 10 The tube housing is fixed by screws onto the collimator assembly housing. The collimator housing contains the optical glass elements which allow the two eyepieces to view the rear face of the IIT. In addition to this, the collimator housing contains the battery and switch which power the IIT and Infra Red (IR) light source.
- 11 The two eyepieces, which are machined aluminium alloy castings containing glass lenses, are mounted on the rear of the collimator housing. The eyepieces are mounted in such a way that they can be turned about an offset axis to enable the user to vary the distance between the eyepieces to suit his own eyes.



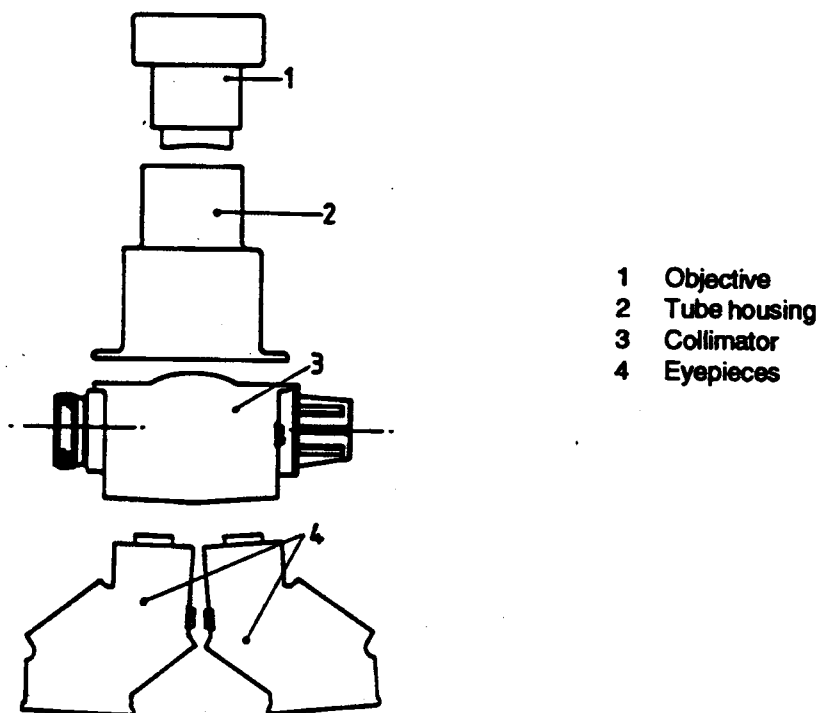
PPE 8304-134E

Fig 1 Goggles with interface



PPE 8304-135I

Fig 2 Headmount



PPE 8209-196

Fig 3 Five main sub assemblies of goggles

Objective assembly

12 The objective assembly (Fig 4) consists of six optical glass elements in a machined aluminium casting which is mounted in the front of the tube housing.

13 Rotation of the objective assembly provides for focusing the goggles from infinity to 400mm from the eye position.

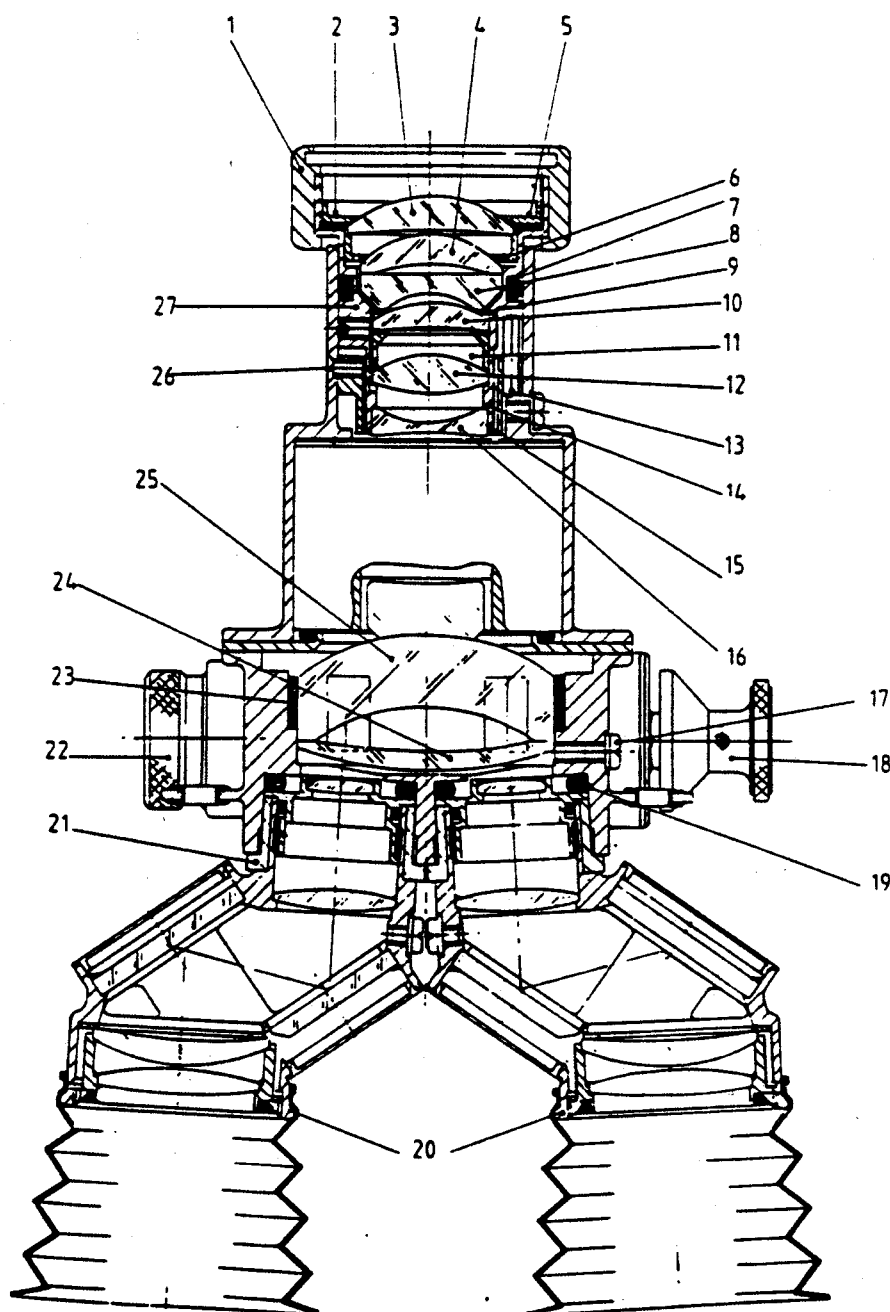
14 Light enters the objective assembly and is refracted by the six glasses to form an image on the IIT photocathode.

15 The No.6 glass (16) is hermetically sealed into the objective housing (27) by a fillet of black silicone rubber (15). The No.5 glass (12) is held against its locating shoulder by spacer No.3 (11). No.4 glass (10) seats against this spacer and is held against it by spacer No.2 (9), glass No.3 (8), glass No.2 (4), spacer No.1 (6), glass No.1 (3). All of these items are held in the housing by clamp ring No.1 (2), and are hermetically sealed by a fillet of black silicone rubber (5).

16 The stop pin (13) prevents the objective being rotated more than the required 320 degrees.

17 The stop ring (14), which carries the stop pin (13) and the thread in which the objective rotates, is secured in the tube housing by three M2.5 countersunk headed screws (26) which are hermetically sealed using Varnish, Red, Antitracking. (HI/8010-99-942-8917).

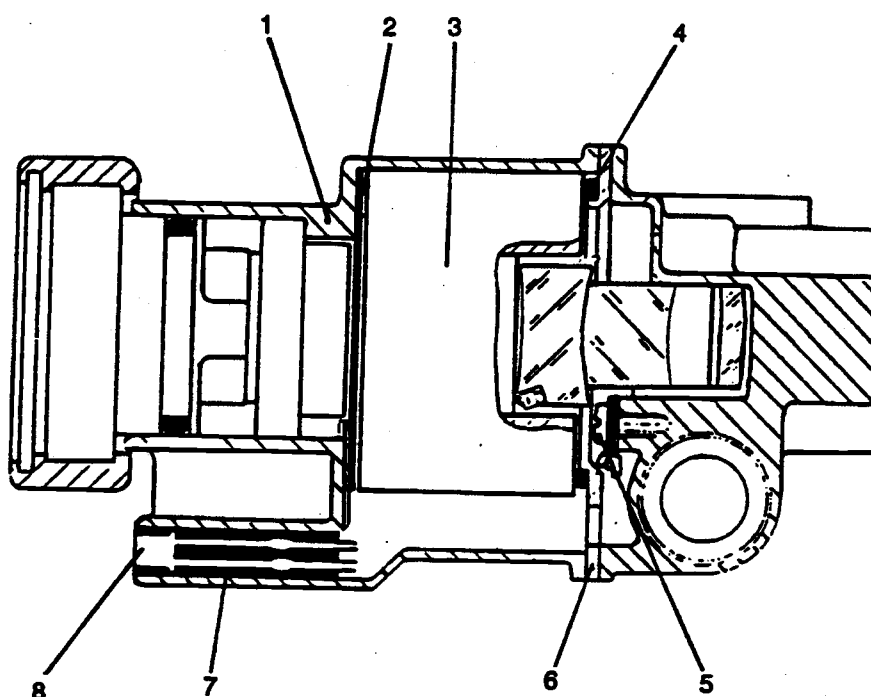
18 The rubber focus grip (1) is adhered to the objective assembly (27) using black silicone rubber. It also provides location for the supplementary neutral density filter when the goggles are used under bright light conditions.



PPE 8209-195

- | | | |
|------------------------|-------------------------|---------------------------|
| 1 Focus grip | 10 Glass No.4 | 19 'O' ring (2 off) |
| 2 Clamp ring No.1 | 11 Spacer No.3 | 20 Eyepieces |
| 3 Glass No.1 | 12 Glass No.5 | 21 Bearing ring, eyepiece |
| 4 Glass No.2 | 13 Stop pin | 22 Battery cap |
| 5 Silicone rubber seal | 14 Stop ring | 23 Silicone rubber |
| 6 Spacer No.1 | 15 Silicone rubber seal | 24 Glass No.8 |
| 7 Roof seal | 16 Glass No.6 | 25 Glass No.7 |
| 8 Glass No.3 | 17 Screw, purging | 26 Screws (3 off) |
| 9 Spacer No.2 | 18 Switch | 27 Objective housing |

Fig 4 Goggles assembly diagram



PPE 8210-131

- | | | | |
|---|--------------|---|----------------------|
| 1 | Tube housing | 5 | Terminal, electrical |
| 2 | Seating ring | 6 | Spacer |
| 3 | IIT | 7 | Silicone rubber |
| 4 | 'O' ring | 8 | IRLED |

Fig 5 Objective and tube housing diagram

Tube housing

19 The tube housing (1) is a light alloy cylindrical casting with a flange to interface with the collimator assembly. It contains the image intensifier tube (3), an IRLED (8) and accommodates the objective assembly at the front and the collimator assembly at the rear.

20 The IIT is located against the seating ring (2) and is held in position against this ring by the 'O' ring (4) as the screws securing the tube housing to the collimator assembly are tightened.

21 The IRLED is potted into the tube housing with black silicone rubber (7).

Image intensifier tube

22 The IIT contains the integral power supply and Automatic Brightness Control (ABC) circuits. Two leads provide connection to the goggles power supply via connectors in the collimator housing.

Collimator assembly

23 The collimator assembly (Fig 4) comprises two optical elements contained in a light alloy housing, a double lens, glass No.7 (25), and a single lens, glass No.8, (24).

24 The glass No.7 (25) and glass No.8 are cemented together and are held in position by the silicone rubber adhesive (23). During production these glasses are accurately located since this affects the quality of the image seen in the eyepieces.

25 The collimator housing also contains the battery housing, (22), the main switch (18) and the electrical terminals for making connection to the IIT set. A purging screw and bonded seal (17) is fitted to the switch side of the collimator housing to permit desiccation of the collimator and tube housing assemblies.

26 The tube housing is fixed to the collimator housing by four screws. The separation between the collimator lens and IIT screen is set by the spacer (Fig 5(6)). On assembly, a measurement is made from the tube housing face, to the IIT face, and by a reference to a table this measurement allows a spacer to be selected from a standard range. Details of this table and the procedure can be found in AESP 5855-G-100-523 Table 2.

Eyepiece

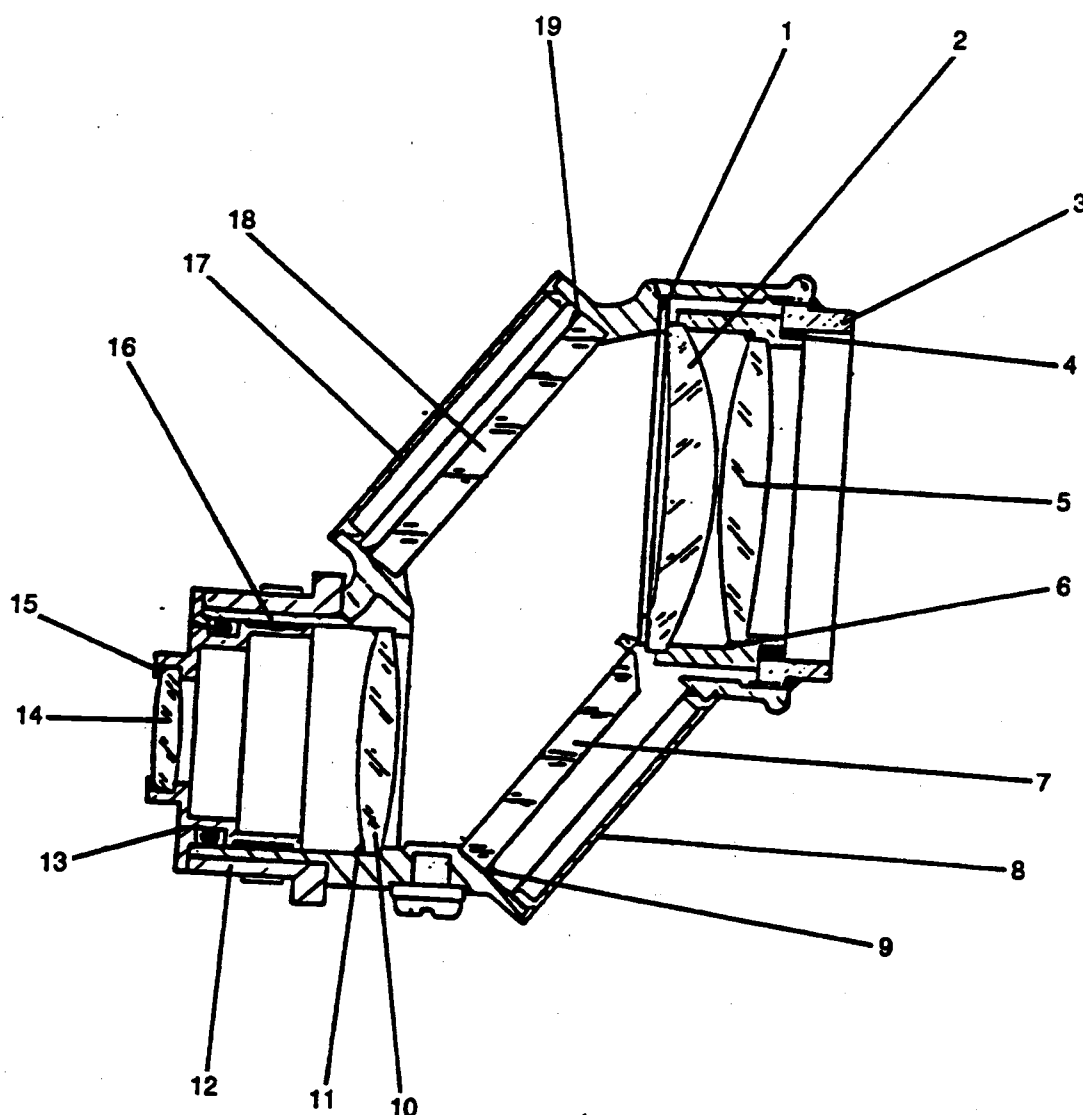
27 Two eyepieces (Fig 4(20)) are located at the rear of the collimator assembly, each is secured in place by the bearing ring (Fig 6(12)). The bearing ring has a threaded portion and is screwed into the eyepiece recess in the collimator housing. The bearing ring retains the eyepiece but allows it to rotate with respect to the collimator.

28 Each eyepiece contains four glass elements and two glass front silvered mirrors.

29 No.9 lens (14) is secured against a shoulder in the No.9 lens cell (13) by a fillet of black silicone rubber. No.10 lens (10) is located against a shoulder in the eyepiece casting and is held in place by a fillet of black silicone rubber (11).

30 After passing through No.10 lens the light is reflected by two front-silvered mirrors (7,18). These mirrors are located against machined shoulders in the eyepiece casting, they are fitted from the outside of the eyepiece and are secured in place by black silicone rubber fillets (9,19). The mirrors are protected by mirror covers (8,17) which are secured in place by black silicone rubber compound.

31 No.11 lens (2) is located against the eyepiece shim (1). This shim is adjusted in thickness during manufacture to achieve the required optical setting of the eyepiece. No.12 lens (5) is secured in its lens cell (6) by a fillet of black silicone rubber. No.12 lens cell is held against No.11 lens by the outer eyepiece ring (3), which is screwed into the eyepiece housing and sealed in place with black silicone rubber (4).



PPE 8210-129

- | | |
|-------------------|--------------------|
| 1 Eyepiece shim | 11 Silicone rubber |
| 2 No.11 Lens | 12 Bearing ring |
| 3 Eyepiece ring | 13 No.9 Lens cell |
| 4 Silicone rubber | 14 No.9 Lens |
| 5 No.12 Lens | 15 Silicone rubber |
| 6 No.12 Lens cell | 16 Adhesive |
| 7 Mirror | 17 Cover, mirror |
| 8 Cover, mirror | 18 Mirror |
| 9 Silicone rubber | 19 Silicone rubber |
| 10 No.10 Lens | |

Fig 6 Eyepiece assembly diagram

SEALING

32 The objective assembly and each of the eyepiece assemblies are sealed by silicone rubber sealing compound during assembly. The sealing of the main goggle housings is accomplished by the two eyepiece 'O' rings (Fig 4(19)) and the roof seal on the objective housing (Fig 4(7)). Desiccation of the main housings is accomplished via the purging screws fitted to the collimator housing and the objective housing.

PRINCIPLES OF OPERATION

Summary

33 The objective lens assembly focuses available light onto the front face of the IIT which then amplifies the light and produces an intensified image on its rear face. This bright image is then viewed via two eyepieces.

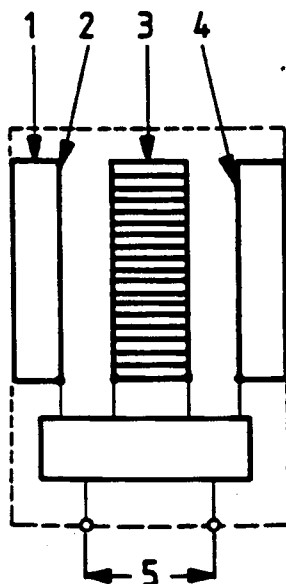
DETAILS OF OPERATION

34 Light enters the objective assembly and is refracted by the six glasses to form an image on the IIT photocathode.

35 Rotation of the objective assembly provides for focusing the goggles from infinity to 400mm from the eye position.

36 The IIT is a single stage electro-optical device which amplifies the light incident upon the input window by approximately 7500 times to form a visible image at the output window.

37 Light falling on the front face of the IIT input window (Fig 7(1)) passes through optical fibres, which form the input window, onto the photocathode (2). Light falling on the photocathode causes the emission of electrons from the surface of the photocathode. These are accelerated to the micro-channel plate (3) by the potential difference between it and the photocathode. The micro-channel plate consists of millions of minute channels through which the electrons pass, and due to secondary emission, increase in number. The plate has the effect of giving an electron gain of approximately 500 times. A useful feature of channel plate amplification is that the saturation of the IIT, due to bright point sources of light, is limited to those channels which are affected without overall reduction of the IIT gain. The electrons, on leaving the micro-channel plate, are accelerated to reach the phosphor screen (4) where they cause the screen to fluoresce and form a visible image.



PPE 8209-202

1 Input window
2 Photocathode

3 Micro-channel plate
4 Phosphor screen

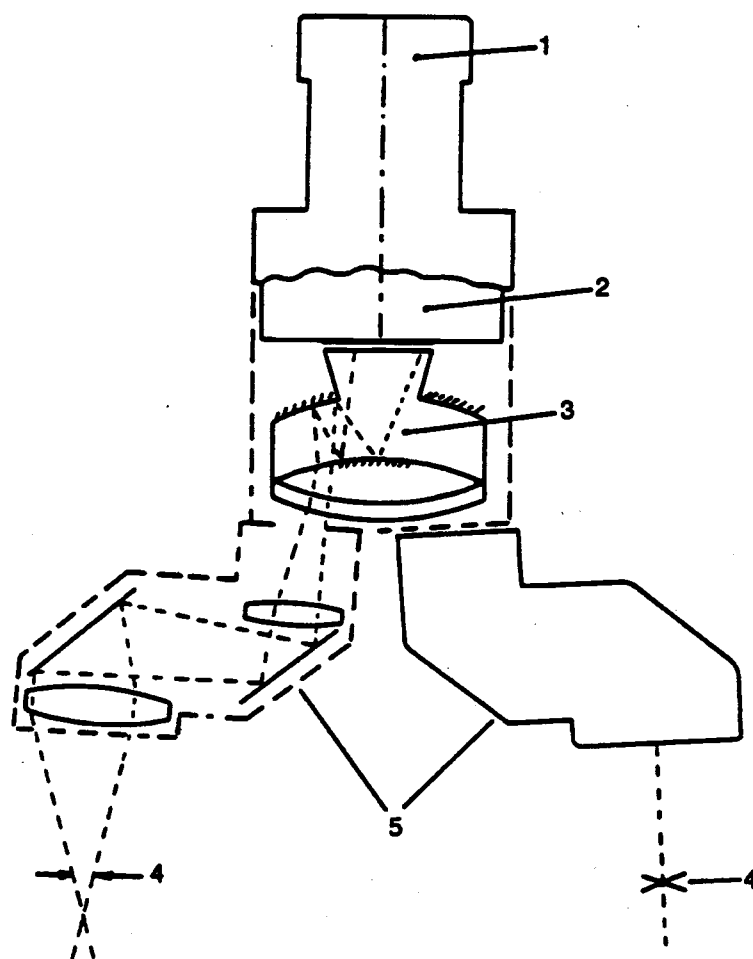
5 Supply terminals

Fig 7 Image Intensifier tube diagram

38 The gain of the IIT is varied by varying the voltage across the micro-channel plate. This is done by the ABC circuit which is encapsulated around the IIT. This circuit senses the photocathode current and varies the voltage applied to the micro-channel plate to maintain an almost constant brightness.

39 The collimator lens assembly collimates the image from the IIT and divides the light into two identical paths.

40 The light then passes into each eyepiece, the optical path of the goggles is illustrated at Fig 8.



PPE 8210-130

- | | | | |
|---|-------------------|---|--------------|
| 1 | Objective | 4 | Eye position |
| 2 | IIT | 5 | Eyepieces |
| 3 | Collimator lenses | | |

Fig 8 Optical path diagram

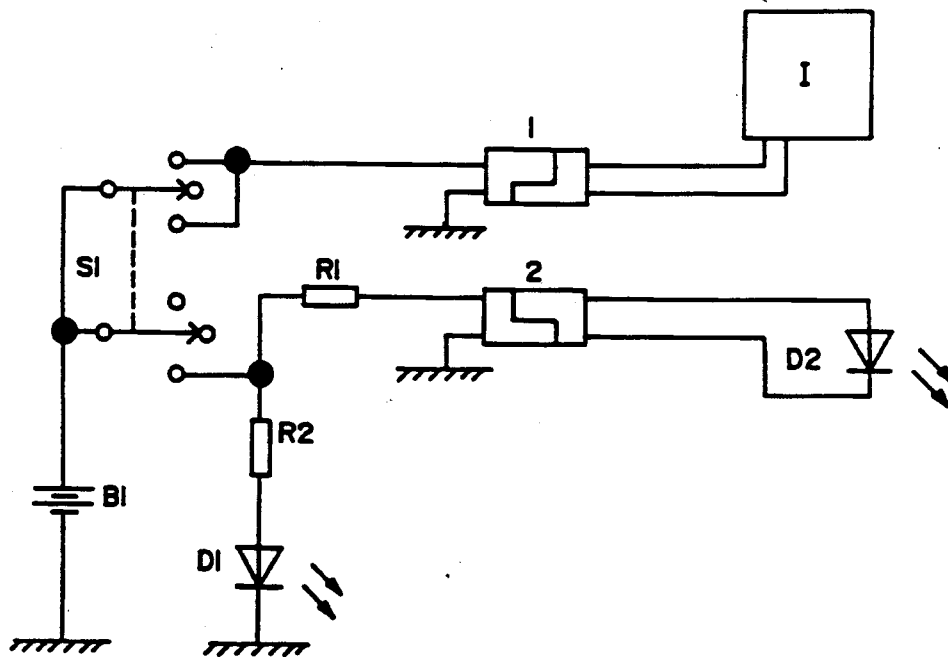
POWER SUPPLIES

41 The goggles are powered from one of two non-rechargeable batteries. The power to the IIT and the IR light source is controlled by the main switch which has three positions:

- 1 Power to IIT only
- 2 OFF
- 3 Power on to IIT and IR source

42 The internal battery is a 3.0V lithium battery type DSB 480010 (NSN 6135-99-774-5711).

43 A wiring diagram of the goggles is shown at Fig 9.



PPE 8308-146

1 IIT connector
2 IRLED connector
B1 Battery
D1 LED
D2 IRLED

S1 Switch
R1 Resistor
R2 Resistor
I IIT

Fig 9 Wiring diagram

MAIN PARAMETERS

44 The main parameters of the goggles are as follows:

- 44.1 Range: The goggles can resolve a main battle tank head-on at a range of 300 m (1000 ft) in conditions of quarter moonlight (10^{-2} Lux), with contrast of 50%.
- 44.2 Magnification: Unity, over the full field of view.
- 44.3 Field of view: 711 mils (40°).
- 44.4 Eyepiece setting: This is pre-set within the range -1.50 -2.10 Dioptré; measured at the centre of the exit pupil.
- 44.5 Focus range: The focus can be varied from infinity down to 400mm from the eye position.

TABLE 1 PHYSICAL DIMENSIONS

Dimension (1)	Goggles (2)	Goggles and headmount (3)	Transit case and equipment (4)
Length	190mm (7.5 in)	190mm (7.5 in)	352mm (13.9 in)
Height	90mm (3.5 in)	150mm (5.9 in)	168mm (6.6 in)
Width	100mm (3.9 in)	180mm (7.1 in)	286mm (11.3 in)
Weight	620gm (1.4 lb)	800g (1.76 lb)	4600g (10 lb)



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WARNINGS

- (1) **TOXIC GASES.** THESE BATTERIES ARE CAPABLE OF GENERATING TOXIC GASES AT HIGH PRESSURE AND MAY BURST IF THEY ARE SUBJECT TO EXCESSIVE HEAT, SHORT CIRCUIT OR IF DISCHARGED WELL BEYOND THEIR NORMAL WORKING LIFE.
- (2) **DISCHARGED BATTERIES.** BATTERIES WHICH HAVE BEEN DISCHARGED SO THAT THEY WILL NO LONGER OPERATE MUST BE PROMPTLY REMOVED AND RETURNED TO STORES. THEY MUST NOT BE BURIED, BURNED, PLACED ON A FIRE, OR PLACED IN ANY RECEPTACLE SUPPLIED FOR ANY OTHER WASTE.
- (3) **PERSONNEL HAZARD.** LITHIUM BATTERIES MUST NOT BE OPENED.
- (4) **BATTERY DISPOSAL.** UNSERVICEABLE BATTERIES MUST BE RETURNED THROUGH STORES CHANNELS FOR DISPOSAL. THEY MUST BE SO PACKED AS TO PREVENT ACCIDENTAL SHORT CIRCUITING. THE PACKAGE AND ACCOMPANYING CORRESPONDENCE MUST BE CLEARLY MARKED 'UNSERVICEABLE LITHIUM BATTERIES FOR DISPOSAL'.
- (5) **HIGH VOLTAGE.** THE IMAGE INTENSIFIER TUBE (IIT) CONTAINED IN THE GOGGLE MAY RETAIN A POTENTIAL OF UP TO 10 KV BETWEEN INPUT AND OUTPUT WINDOWS. THE TUBE ASSEMBLY MUST NOT BE REMOVED UNTIL THE GOGGLE HAS BEEN SWITCHED OFF FOR AT LEAST 15 MINUTES. WHEN REMOVED THE TUBE ASSEMBLY SHOULD BE HANDLED WITH CARE AND SHOULD NOT BE DISCHARGED BY SHORTING THE TWO TUBE CONTACTS TOGETHER.
- (6) **RADIOACTIVE SUBSTANCE.** THE ASSESSOR NIGHT SIGHT CONTAINS A GASEOUS TRITIUM LIGHT SOURCE (NUCLEAR LAMP). NO HAZARD CAN ARISE UNLESS THE LAMP IS BROKEN. DISPOSAL OF NUCLEAR LAMPS IS TO BE IN ACCORDANCE WITH THE RADIOACTIVE SUBSTANCES (LUMINOUS ARTICLES) ORDER 1962.

CAUTIONS

- (1) **SEALED INSTRUMENT.** The equipment is a sealed instrument and the user must not tamper with, or strip the equipment, in excess of that shown in AESP 5855-G-100-201.
- (2) **CLEANING DAMAGE.** Dirt or moisture entering the equipment will badly affect its performance. Great care must be taken to avoid scratching the glass surfaces during cleaning. No attempt should be made to wipe off mud or grit in a dry state. DO NOT use petroleum spirit to clean glass surfaces.
- (3) **BRIGHT LIGHT.** The photocathode or IIT may be damaged, if bright light either natural or artificial, is allowed to enter the objective system. In daylight and when the equipment is not in use the Neutral Density (ND) filter must be fitted.
- (4) **BATTERY MANAGEMENT.** Discharged batteries are to be removed from the equipment and returned to stores for disposal.
When returning equipment to stores, batteries are to be removed and separately returned.
- (5) **BATTERY LIFE.** Continuous use of the infra-red light source will reduce the life of the battery.
- (6) **LIGHT SOURCE.** Inadvertent switching on of the infra-red light source could reveal the position of an operator to the enemy.
- (7) **EQUIPMENT DAMAGE.** Lithium batteries used in this equipment must not be recharged.

SPECIAL TOOLS AND TEST EQUIPMENT

1 The Special Tools and Test Equipment (STTE) required to carry out the tests detailed in this chapter are listed at Table 1.

TABLE 1 SPECIAL TOOLS AND TEST EQUIPMENT

Serial (1)	Catalogue No. (2)	Designation (3)	Qty (4)
1	V7/6650-99-782-4465/66	Collimator, General Purpose, L2A1/L2A2	
2	W5/4910-99-465-3081	Level, Spirit, Precision	
3	Z4/6625-99-520-9571	Multimeter, Set No. 1, Mk 2	
4	V7/4931-99-965-2409	Telescope Dioptre Setting	
5	Z7/5855-99-967-0243	Test Equipment, General Purpose Image Intensified Goggle, comprising the following tools:	
5.1	Z7/5855-99-965-6033	Adaptor, Twin Telescope	
5.2	Z7/5855-99-967-0249	Reticle Attachment, Collimator Adaptor	
5.3	Z7/5855-99-967-0418	Mount, Goggle	
5.4	Z7/5855-99-967-0244	Test Chart Assembly	
5.5	Z7/5855-99-967-0245	Holder and Wedge Assembly, Supplementary Lens	
5.6	Z7/5855-99-967-0248	Adaptor Plate Assembly	
5.7	Z7/5855-99-967-0246	Spanner, Wrench	
5.8	F1/5120-99-122-6463	Wrench Key, Socket Head Screw	
5.9	Z7/5855-99-967-0247	Plane Mirror	
5.10	Z7/5855-99-967-0417	Diode Insertion Tool	
6	V7/6625-99-967-6126	Night Sight Assessor, Cased	

GENERAL

CAUTION

CLEANING DAMAGE. Dirt or moisture entering the equipment will badly affect its performance. Great care must be taken to avoid scratching the glass surfaces during cleaning. No attempt should be made to wipe off mud or grit in a dry state. DO NOT use petroleum spirit to clean glass surfaces.

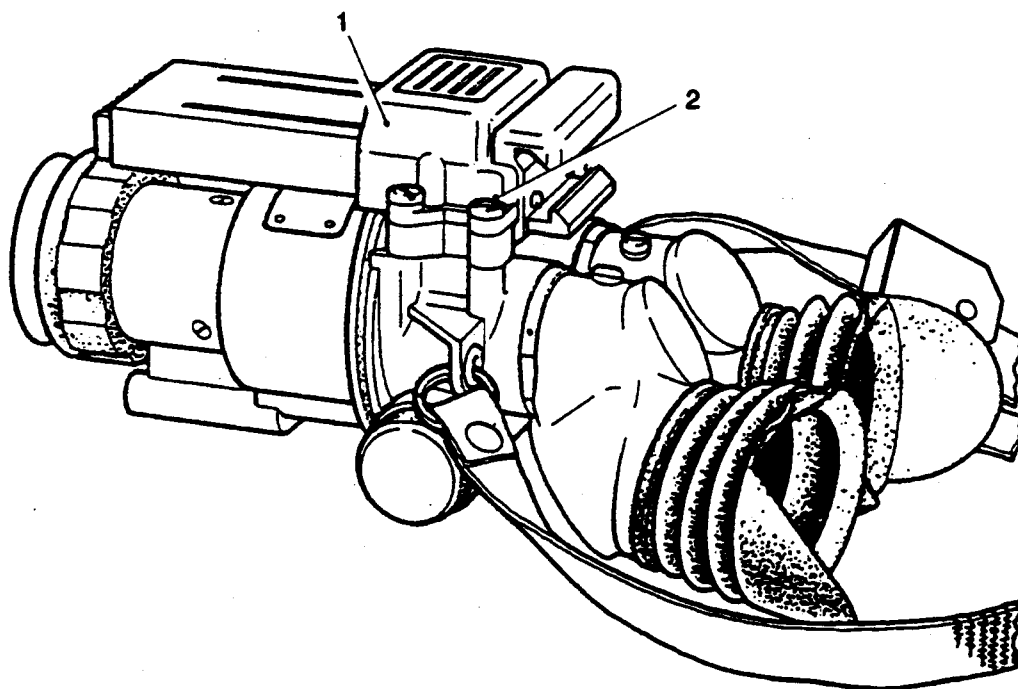
2 Before proceeding with any tests or repairs the goggles are to be examined as follows:

2.1 Ensure that glass surfaces are clean and undamaged.

2.2 Ensure that the goggles are complete as per the Complete Equipment Schedule (CES) (service edition).

2.3 Examine the exterior for evidence of distortion or other damage to the objective, tube housing, collimator or eyepieces.

2.4 Ensure that a serviceable battery is installed in the goggles.



PPE 8304-135H

1 Cantilever assembly

2 Screws (4 off)

Fig 1 Goggles with interface

OPERATION

General

CAUTION

BRIGHT LIGHT. The photocathode or IIT may be damaged, if bright light either natural or artificial, is allowed to enter the objective system. In daylight and when the equipment is not in use the Neutral Density (ND) filter must be fitted.

3 Remove the cantilever assembly (Fig 1(1)) from the goggles, by removing the four fixing screws (2) and lifting away the interface.

4 Remove the rubber eye cups by pulling them off the eyepieces.

5 The tests detailed at Para 6 to 16 can be carried out in normal ambient light provided the ND filter is fitted.

Tube operation

6 Switch on the goggles by moving the switch to position 1, and look into the goggles. The entire field of view should be evenly illuminated with green light. If it is not illuminated, refer to Table 2.

7 The picture should be free from bright or dark spots, or other blemishes outside those permitted by the blemish chart (Fig 2).

CAUTION

BRIGHT LIGHT. The photocathode or IIT may be damaged, if bright light either natural or artificial, is allowed to enter the objective system. In daylight and when the equipment is not in use, the Neutral Density (ND) filter must be fitted.

- 7.1 Place the chart (Fig 2) on a suitable vertical surface.
- 7.2 Switch on the goggles by moving the switch to position 1.
- 7.3 Observe the chart through the goggles and move towards or away from the chart until the outer circle of the chart fills the complete FOV of the goggles.
- 7.4 If the size and quantity of blemishes exceed the permitted amount, (as indicated on the chart) the goggles should be returned to Field Repair.

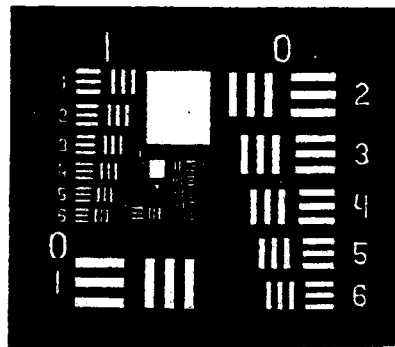
NOTE – Figure 2 is located at the end (page 13/14) of this Cat AESP.

8 Overall performance is to be tested using Assessor, Night Sight, (Table 1 Serial 6), as follows:

WARNING

RADIOACTIVE SUBSTANCE. THE ASSESSOR NIGHT SIGHT CONTAINS A GASEOUS TRITIUM LIGHT SOURCE (NUCLEAR LAMP). NO HAZARD CAN ARISE UNLESS THE LAMP IS BROKEN. DISPOSAL OF NUCLEAR LAMPS IS TO BE IN ACCORDANCE WITH THE RADIOACTIVE SUBSTANCES (LUMINOUS ARTICLES) ORDER 1962.

- 8.1 Switch the goggles off.
- 8.2 Remove the ND filter from the goggles.
- 8.3 Fit the adaptor onto the goggles objective, fit the assessor onto the adaptor. Tighten the clamp screw on the assessor sufficiently to secure.
- 8.4 Switch on the goggles, focus the goggles onto the assessor test chart.
- 8.5 Observe which pattern can be resolved (horizontal and vertical bars). The minimum pattern that should be resolved is 2-6, Fig 3.
- 8.6 Switch the goggles off. Remove the assessor and adaptor. Replace the ND filter.



PPE 8311-127

Fig 3 Resolution chart

Objective focus operation

9 Operation of the objective is achieved by rotating the objective lens assembly. This movement should be smooth and firm. If it is not, the objective lens assembly must be removed to examine the focusing thread, the roof seal and the front of the tube housing for damage or dirt. Refer to AESP 5855-G-100-523 for removal of the objective lens assembly.

10 The angle through which the objective lens assembly can be turned should not be greater than 320°. If it is, the objective lens assembly must be removed to inspect for damage to the stop pin or focus ring and possible damage to the front face of the Image Intensifier Tube (IIT).

Eye-piece operation

11 The movement of each eyepiece should be smooth and firm. If it is not then the eyepiece is to be removed for inspect for damage to the sealing ring, the eyepiece bearing ring or the rear of the collimator. Refer to AESP 5855-G-100-523 for removal of the eyepiece assembly.

Infra-red light source operation

CAUTIONS

(1) **BRIGHT LIGHT.** The photocathode or IIT may be damaged, if bright light either natural or artificial, is allowed to enter the objective system. In daylight and when the equipment is not in use the Neutral Density (ND) filter must be fitted.

(2) **BATTERY LIFE.** Continuous use of the infra-red light source will reduce the life of the battery.

12 Ensure the ND filter is fitted. Turn the switch to position 2. Look into the plane mirror fitted into the lid of the test equipment.

13 Adjust the focus so that the goggles are focused on their own reflection.

14 Looking through the goggles at their reflection in the plane mirror the Infra Red (IR) source should show up as a bright point of light. The visible warning Light Emitting Diode (LED) should also be visible in the field of view.

15 If the visible LED does not light up, refer to AESP 5855-G-100-523 for renewal instructions.

16 If the infra-red light source does not light up refer to AESP 5855-G-100-523 for renewal instructions.

OPTICAL TESTS

General

17 All optical tests must be carried out in a darkened room, with the ND filter removed from the goggles.

Setting up procedure

18 Mount the goggles on the General Purpose Collimator (Table 1 Serial 1), as follows:

18.1 Fix the Base Mounting Adaptor onto the General Purpose Collimator bed, fit the Mounting Adaptor onto the Base Mounting Adaptor, fit the Goggle Mount (Table 1 Serial 5.3) onto the Base Mounting Assembly.

18.2 Remove the cantilever and eye cups from the goggles as detailed in Para 3.

18.3 Fit the goggles to the Goggle Mount using the four captive screws on the Goggle Mount.

18.4 Check that the ND filter is in place on the goggles, ensure the goggles switch is off, fit a new battery.

18.5 Level the mounting adaptor by use of the adjusting screws on the stanag mount and a spirit level (Table 1 Serial 2).

19 Select and fit the Cell Assembly, Optical Instrument. Set the GP Collimator filter bank to position 1. Set the GP Collimator focus to Infinity.

Eyeiece focus**CAUTION**

LIGHT DAMAGE. Ensure that the room is darkened.

- 20 Switch on the goggles and remove the ND filter. Focus the goggles on the Collimator fan pattern.
- 21 Position a Dioptrescope (Table 1 Serial 4) in front of each eyepiece in turn looking at the centre of the exit pupil. Adjust the Dioptrescope for best focus of the fan pattern, the grain of the IIT should be visible. This may appear as a honey comb effect caused by the optical fibres comprising the output window. The Dioptrescope must indicate an eyepiece setting between -1.5 and -2.1 Dioptres.
- 22 Failure to show this correct focus indicates a faulty eyepiece or faulty Collimator, for corrective action to be taken refer to Table 2.

Objective focus range

- 23 The objective focus range of the goggles is 400 mm from the eye to infinity.
- 24 Mount the goggles on the GP Collimator, as detailed in Para 18. Set the GP Collimator filter back to position 1 and filter bank 2 to position B. Switch on the Collimator and goggles. Set Collimator focus to infinity.
- 25 Set the objective lens of the goggles to focus at infinity, by rotating it between its limits, until the best resolution of the test graticule is achieved as seen through the eyepieces. Check that the focus mechanism will go past the position of best focus at infinity. The fan pattern (at Fig 4) A to B should be resolved to a point at halfway from A to B. If it is not resolved, there is a fault condition, but carry out Paras 26 to 29 before referring to Table 2.
- 26 Remove the goggles from the Collimator. Rotate the goggles objective lens to the fully clockwise position (when viewed from the eyepiece end of the goggles). Looking into the eyepieces move the goggles relative to any target until the best focal position is found.
- 27 Measure the distance from the target to the goggles. This should be less than or equal to 400 mm from the target to the eye position.
- 28 If this measurement is not as specified there is an objective lens fault and the objective lens assembly is to be renewed.
- 29 If resolution is so poor that a best focal position is difficult to locate, refer to Table 2.

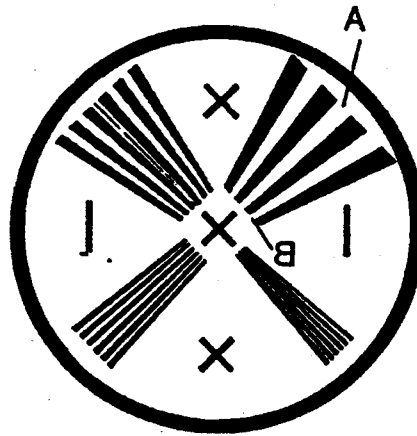


Fig 4 Collimator test graticule

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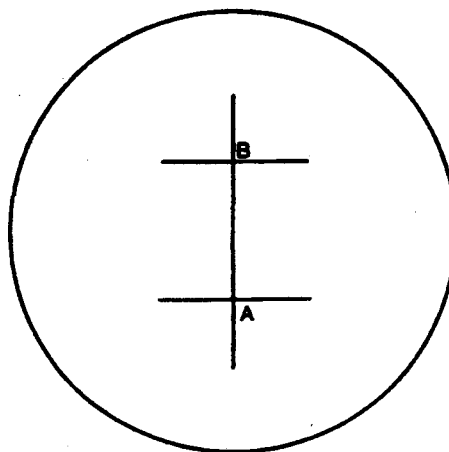


Fig 5 Test graticule

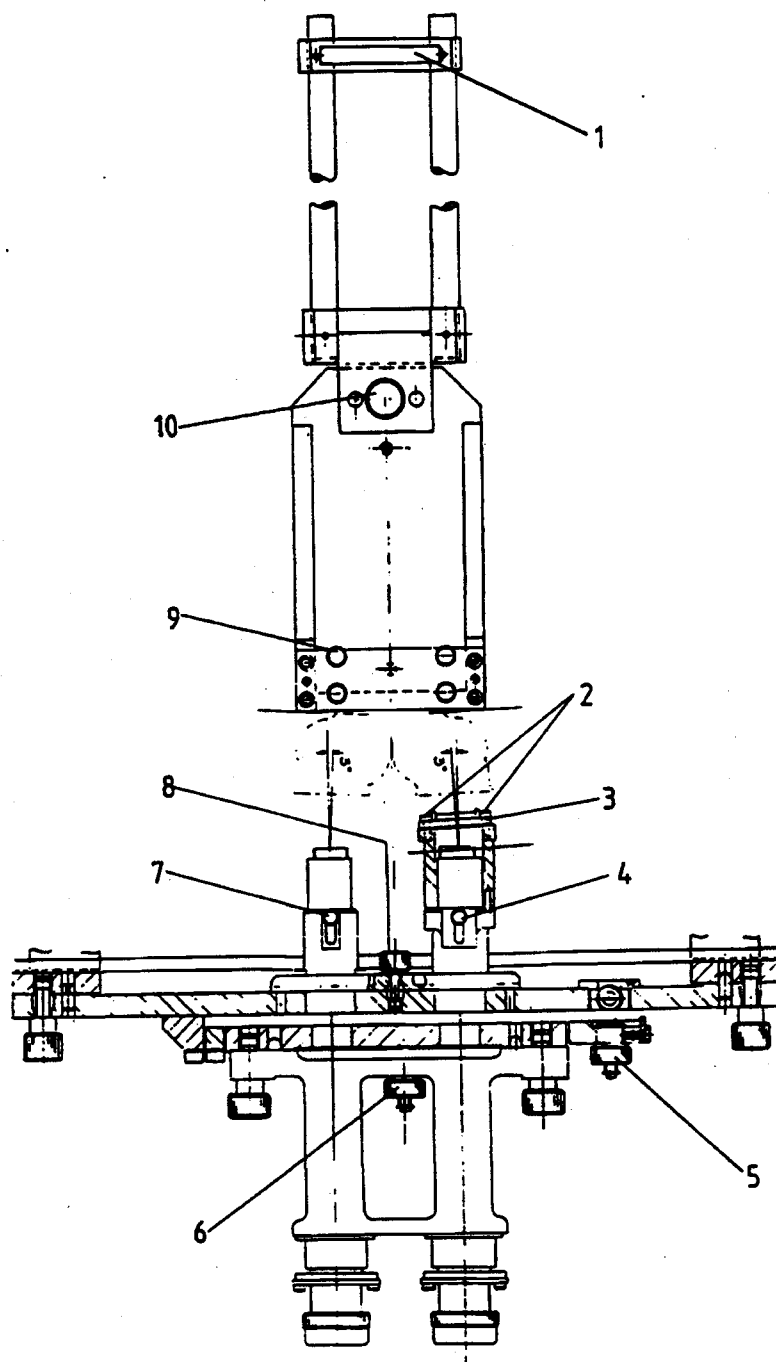
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CONVERGENCE AND SUPRAVERGENCE**NOTE**

Paras 30 to 45 can be carried out at normal illumination levels.

- 30 Turn the GP Collimator to 90° from its central position.
- 31 Fit the Base Mounting Adaptor L11A1 onto the Collimator cradle.
- 32 Fit the Adaptor L17A1 onto the base mounting adaptor.
- 33 Fit the Adaptor Plate Assembly (Table 1 Serial 5.6) onto the Adaptor L11A1.
- 34 Fit the Adaptor, Twin Telescope (Table 1 Serial 5.1) onto the Adaptor Plate Assembly.
- 35 Fit the twin telescopes onto the Adaptor, Twin Telescope.
- 36 Fit the Holder and Wedge Assembly, Supplementary Lens (Table 1 Serial 5.5) onto the Adaptor Twin Telescope.
- 37 Fit the Goggle Mount (Table 1 Serial 5.3) onto the Adaptor L17A1.
- 38 Fit the test chart assembly (Table 1 Serial 5.4). Using the spirit level (Table 1 Serial 2) check that the goggle mount is horizontal to the Adaptor L17A1.
- 39 Look through each channel of the twin telescope, adjust the focus of each channel as necessary to obtain the best image of the test graticule using focusing adjustment (Fig 6(4 and 7)) on the adaptor and twin telescope eyepieces.
- 40 Note the position of the graticule intersection (Fig 5(A)) in each channel. They should both be in the centre of the field of view. If either are not in the centre, the image position must be adjusted using the optical wedges (Fig 6(3)) as follows.
- 41 Using the adjustor screws (5 and 6), adjust the attitude of the twin telescope, until the image in the LH telescope is in the centre of the field of view. Slacken the screws (2) securing the fine adjustment optical wedges on the right hand supplementary lens assembly and rotate the wedges until the image in the RH telescope is at the centre of the field of view. Lock the fine adjustment by retightening the screws (2). Recheck and readjust if necessary.
- 42 Remove the supplementary lens assembly by unscrewing the captive screw (8) and lifting the assembly away. Take care not to disturb the optical wedges and focus adjustment.
- 43 Fit the Reticle Attachment, Collimator Adaptor (Table 1 Serial 5.2) in place of the Supplementary Lens Assembly.
- 44 Fit the goggles onto the goggle mount and secure with the captive screws (9).
- 45 Remove the twin telescopes.
- 46 Darken the room.
- 47 Switch the goggles on and remove the ND filter. Observe the illuminated patches on the graticules.
- 48 Look into one channel of the Graticule Attachment so that the two vertical graticules align with each other. Adjust the position of the goggles eyepiece so that the patch of light falls centrally upon the graticule nearest to the goggles. Repeat this with the other eyepiece.

- 49 Remove the Graticule Attachment from the Twin Telescope Adaptor and refit the Supplementary Lens Assembly.
- 50 Refit the twin telescopes.
- 51 Look through the twin telescopes and observe the image of the test graticule in the goggles eyepieces. Adjust the focus on the goggles, if necessary, to give the best image.
- 52 Note the position of the intersection (Fig 5(B)) in each channel.
- 53 Calculate the difference in position of the two images, in a vertical and horizontal direction.
- 54 The differences should be less than 9 mils vertically and 12 mils horizontally. If they lie outside these limits, the convergence or supravergence is out of specification (refer to Table 2 Serial 9).
- 55 If the image of the intersection of the graticule in either channel is further than 45 mils horizontally or vertically from the optical axis, the collimator assembly should be renewed (refer to AESP 5855-G-100-523).



PPE 8210-128

- | | |
|---------------------------------|-------------------------------|
| 1 Test chart | 6 Adjuster screw |
| 2 Screws (4 off) | 7 Focus adjuster (LH channel) |
| 3 Wedges optical (2 off) | 8 Screw, captive |
| 4 Focus adjustment (RH channel) | 9 Screws, captive (4 off) |
| 5 Adjuster screw | 10 Screw, captive |

Fig 6 Test equipment, mounted

TABLE 2 FAILURE DIAGNOSIS

Serial (1)	Symptom (2)	Probable cause (3)	Remedy (4)
1	Sight fails to produce green glow on rear face.	1.1 Sight not switched on. 1.2 Battery not inserted. 1.3 Battery discharged. 1.4 Battery inserted wrong way round. 1.5 Battery terminals dirty. 1.6 Switch defective. 1.7 IIT defective.	Check. Check. Fit a known good battery. Check that battery is (+) end inwards. Clean terminals. Remove switch and check operation of switching using multimeter set. (Table 1 Serial 3). Replace IIT with known good IIT.
2	Sight has poor resolution when set at infinity, but good resolution at minimum focus distance in both eyepieces.	Faulty objective assembly.	Renew objective assembly.
3	Sight has poor resolution at minimum focus distance but good resolution at infinity in both eyepieces.	Faulty objective assembly.	Renew objective assembly.
4	Sight has poor resolution at minimum focus distance and poor resolution at infinity in both eyepieces. "Grain" on the tube is visible in both eyepieces.	4.1 Misty optics in objective. 4.2 Faulty objective assembly.	Remove objective assembly, repurge and replace assembly. Renew objective assembly.
5	Poor resolution at infinity and at minimum focus distance. "Grain" on the tube is not visible in either eyepiece.	5.1 Misty optics in collimator. 5.2 Misty optics in eyepieces. 5.3 Both eyepieces faulty. 5.4 Collimator assembly faulty.	Repurge collimator assembly. Remove eyepieces repurge replace. Renew left eyepiece; if image in this eyepiece is now corrected, renew the right eyepiece. If image not corrected go to Serial 5.4. Renew collimator and refit old eyepieces if renewed.
6	Resolution is poor at infinity and at minimum focus distance in one eyepiece only.	6.1 Misty optics in eyepiece. 6.2 Faulty eyepiece.	Remove eyepiece, repurge and replace; retest. Renew eyepiece retest.
7	Dioptric setting incorrect in both eyepieces.	7.1 Fault in both eyepieces. 7.2 Check that the correct spacer is fitted as detailed in AESP 5855-G-100-523 7.3 Fault in collimator.	Fit new left eyepiece and retest, if left eyepiece is now correct fit new right eyepiece, if fitting new left eyepiece makes no difference go to Serial 7.2. Fit correct spacer. Renew collimator.
8	Dioptric setting incorrect in one eyepiece only.	Fault in that eyepiece.	Renew or correct eyepiece.
9	Convergence or supravergence out of specification.	9.1 Eyepiece fault. 9.2 Collimator fault.	Adjust left eyepiece as detailed in AESP 5855-G-101-523 para 75. If fault still exists adjust right eyepiece. If fault still exists go to Serial 9.2. Renew collimator.

Sample Blemish size:

- 375 micron
- 300 micron
- 225 micron
- 150 micron

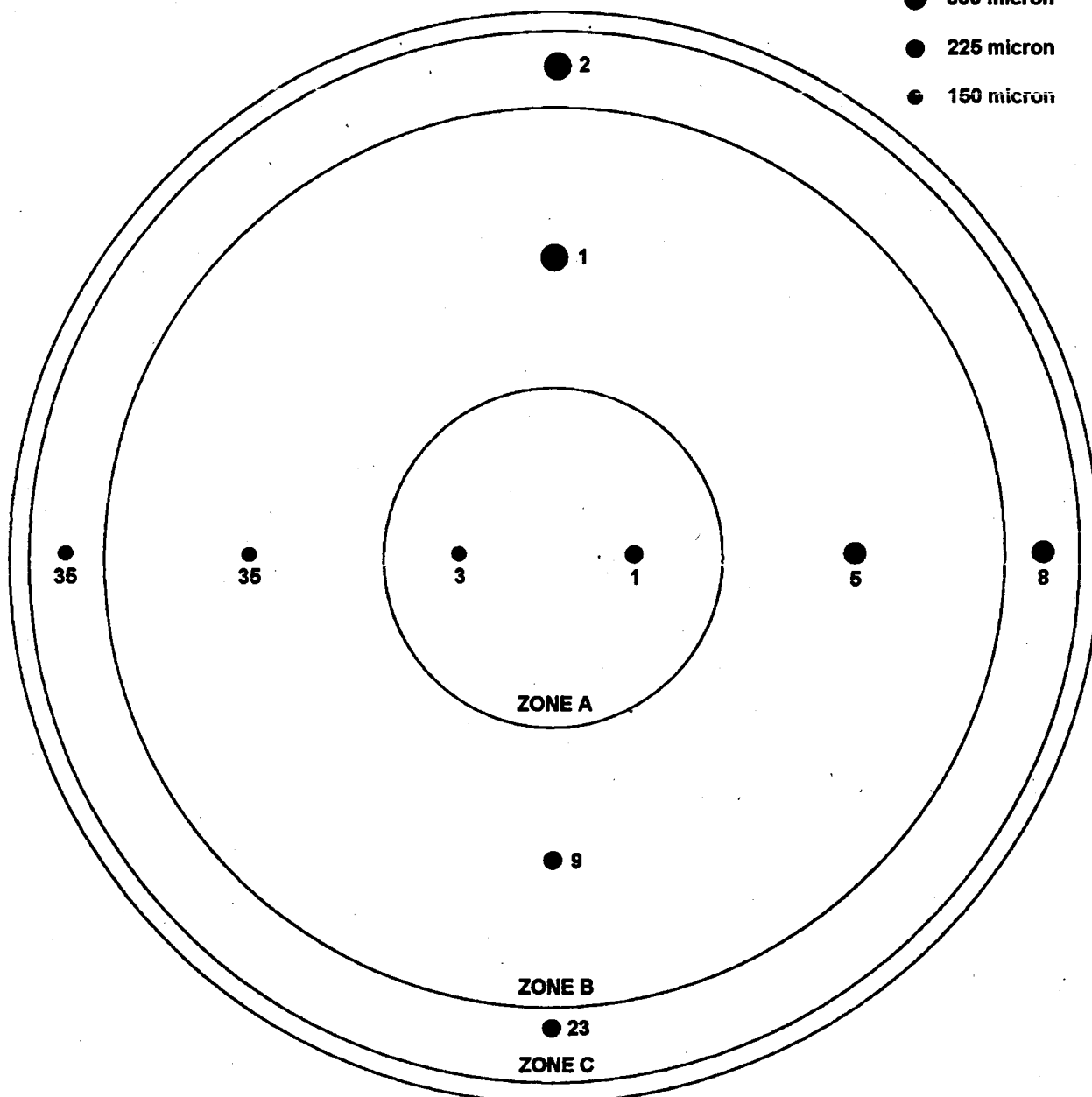


Fig 2 Blemish chart



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GOGGLES, IMAGE INTENSIFIED, GENERAL PURPOSE, CASED L1A2

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Ministry of Defence
Issue by:

**ARMY TECHNICAL SUPPORT AGENCY
Ha Ha Road, Woolwich
LONDON SE18 4QF**

UK-RESTRICTED

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ASSOCIATED PUBLICATIONS

EMER Mgmt 0 028 Inspection Standards, General.

EMER T & M A 028 Chapter 504 Inspection and Testing of Night Viewing Devices.

WARNINGS

- (1) **TOXIC GASES.** THESE BATTERIES ARE CAPABLE OF GENERATING TOXIC GASES AT HIGH PRESSURE AND MAY BURST IF THEY ARE SUBJECT TO EXCESSIVE HEAT, SHORT CIRCUIT OR IF DISCHARGED WELL BEYOND THEIR NORMAL WORKING LIFE.
- (2) **DISCHARGED BATTERIES.** BATTERIES WHICH HAVE BEEN DISCHARGED SO THAT THEY WILL NO LONGER OPERATE MUST BE PROMPTLY REMOVED AND RETURNED TO STORES. THEY MUST NOT BE BURIED, BURNED, PLACED ON A FIRE, OR PLACED IN ANY RECEPTACLE SUPPLIED FOR ANY OTHER WASTE.
- (3) **PERSONNEL HAZARD.** LITHIUM BATTERIES MUST NOT BE OPENED.
- (4) **BATTERY DISPOSAL.** UNSERVICEABLE BATTERIES MUST BE RETURNED THROUGH STORES CHANNELS FOR DISPOSAL. THEY MUST BE SO PACKED AS TO PREVENT ACCIDENTAL SHORT CIRCUITING. THE PACKAGE AND ACCOMPANYING CORRESPONDENCE MUST BE CLEARLY MARKED 'UNSERVICEABLE LITHIUM BATTERIES FOR DISPOSAL'.
- (5) **HIGH VOLTAGE.** THE IMAGE INTENSIFIER TUBE (IIT) CONTAINED IN THE GOGGLE MAY RETAIN A POTENTIAL OF UP TO 10 kV BETWEEN INPUT AND OUTPUT WINDOWS. THE TUBE ASSEMBLY MUST NOT BE REMOVED UNTIL THE GOGGLE HAS BEEN SWITCHED OFF FOR AT LEAST 15 MINUTES. WHEN REMOVED THE TUBE ASSEMBLY SHOULD BE HANDLED WITH CARE AND SHOULD NOT BE DISCHARGED BY SHORTING THE TWO TUBE CONTACTS TOGETHER.

CAUTIONS

- (1) **SEALED INSTRUMENT.** The equipment is a sealed instrument and the user must not tamper with, or strip the equipment, in excess of that shown in AESP 5855-G-100-201.
- (2) **CLEANING DAMAGE.** Dirt or moisture entering the equipment will badly affect its performance. Great care must be taken to avoid scratching the glass surfaces during cleaning. No attempt should be made to wipe off mud or grit in a dry state.
- (3) **BRIGHT LIGHT.** The photocathode or IIT may be damaged, if bright light either natural or artificial, is allowed to enter the objective system. In daylight and when the equipment is not in use the Neutral Density (ND) filter must be fitted.
- (4) **DISCHARGED BATTERIES.** Remove discharged batteries from the equipment and return the batteries to stores. Remove batteries from the equipment before returning to stores; return the batteries to stores.
- (5) **BATTERY LIFE.** Continuous use of the infra-red light source will reduce the life of the battery.
- (6) **LIGHT SOURCE.** Inadvertent switching on of the infra-red light source could reveal the position of an operator to the enemy.
- (7) **EQUIPMENT DAMAGE.** Lithium batteries used in this equipment must not be recharged.

INTRODUCTION

1 This publication details the standard to be applied to the equipment Goggles, Image Intensified, General Purpose, Cased L1A2 during quality assessment and after repair at field and base levels. The following should be noted:

1.1 Equipment is to be sentenced in accordance with EMER T & M A 028 Chapter 006 Material Quality Assessment - Principles and Practices in REME and the latest DCI.

1.2 This standard is to be applied in conjunction with the associated publications listed in the preliminary material to this Category.

TEST EQUIPMENT

2 The specification figures are based on measurements made with the test equipment listed in Table 1.

TABLE 1 TEST EQUIPMENT

Item (1)	Catalogue No. (2)	Designation (3)	Qty (4)
1	V7/6650-99-782-4465/66	Collimator, General Purpose, L2A1/L2A2	1
2	V7/6625-99-967-0126	Night Sight Assessor Cased	1
3	V7/4931-99-965-2409	Telescope Dioptre Setting	1
4	Z7/5855-99-967-0243	Test Equipment, General Purpose Image Intensified Goggle	1
5	V7/6685-99-962-5713	Leak Detector Kit	1

SCHEDULE

3 This schedule is to be reproduced and used as an Inspection Record.

GENERAL PURPOSE NIGHT VISION GOGGLES					Serial No.:
Acceptable Quality Levels (AQLS)					
Serial (1)	Test/operation (2)	Reference (3)	Field (4)	Result (5)	
1	GPNVG Cased for Complete Equipment NOTE When handling batteries attention must be paid to Warnings (1) to (4) contained in the preliminary material to this AESP	CES	1. Case, Transit 2. Goggles, GP and Neck Strap with filter pouch 3. Pouch, Carrying, complete with Strap 4. Face Frame and Pad Cushioning 5. Weight, Counterbalance 6. Skull Cap Assembly 7. Batteries 8. AESP 5855-G-100-201 9. Lens Cloth, Cleaning 10. Tissue, Demist 11. Hood, Lens		

(continued)

SCHEDULE (continued)

Serial (1)	Test/operation (2)	Reference (3)	Field (4)	Result (5)
2	<p>General condition of equipment</p> <p>a. Transit Case</p> <p>b. Pouch, Carrying</p>	EMER T & M A 028 Chap 504	<ol style="list-style-type: none"> 1. Inspect the case for cracks, fractures and dents. 2. Inspect the soundness of paint finish. 3. Inspect case lid hinge and seal. 4. Inspect catches for effectiveness. 5. Inspect the carrying handle for securing burrs or damage. 6. Inspect the designation labels for clarity and completeness. 7. Inspect the rubber feet for damage and security. 8. Inspect the internal rubber cushion for wear, splits and resilience. 1. Inspect carrying strap for frayed material damaged stitching, loose rivets, damaged clips and adjuster. 2. Inspect zip and velcro strips for damage and correct operation and holding. 	

(continued)

SCHEDULE (continued)

Serial (1)	Test/operation (2)	Reference (3)	Field (4)	Result (5)
2 (cont)	b. cont		3. Inspect all stitching for wear or signs of fraying.	
	c. Face Frame		4. Inspect all internal pockets for damage, contamination and security of attachment. 1. Inspect the face frame for cracks, fractures or signs of stress. 2. Inspect the pivot pins and circlips for rust and ensure free pivot movement. 3. Inspect skull cap assembly securing pins and counterbalance fixing for soundness.	
	d. Pad Cushioning		1. Inspect the cushion for splits or cracks and check the pocket material for soundness.	
	e. Counterbalance		2. Check resilience of the cushion. 1. Inspect the counterbalance for frayed material and damaged stitching.	
			2. Inspect the three fasteners for security, rust and effectiveness. 3. Weigh the counterbalance. Weight to be approximately 500 g.	

(continued)

SCHEDULE (continued)

Serial (1)	Test/operation (2)	Reference (3)	Field (4)	Result (5)
2 (cont)	<p>f. Hood, lens</p> <p>g. Goggles, General Purpose Night Vision</p>		<p>1. Inspect the lens hood for splits and tears.</p> <p>2. Fit the lens hood to the goggles objective assembly and check for secure fitting.</p> <p>3. Inspect for stiffness of the hood cone and check for droop or collapse.</p> <p>1. Inspect the goggles for cracks, dents or other physical damage.</p> <p>2. Inspect for soundness of the paint finish.</p> <p>3. Inspect for security and soundness of the focus grip.</p> <p>4. Inspect the cantilever assembly operation, check that the four mounting screws are fitted and tight.</p> <p>5. Inspect both eyecups for splits and tears and ensure a secure fitting to the eyepiece assemblies.</p> <p>6. Remove the battery cap and inspect the cap thread and the thread in the goggles body.</p> <p>7. Inspect the battery cap sealing ring and contact spring.</p>	

(continued)

SCHEDULE (continued)

Serial (1)	Test/operation (2)	Reference (3)	Field (4)	Result (5)
2 (cont)	g. cont		<p>8. Inspect the battery compartment cleanliness and check that no acid attack on the anodising exists.</p> <p>9. Inspect the positive battery contact for cleanliness ensuring no discolouration of the contact surface.</p> <p>10. Inspect the switch knob for security and damage.</p> <p>11. Operate the switch ensuring positive stops and pull and turn for position 2.</p> <p>12. Inspect the designation and modification labels for clarity, completeness and security.</p> <p>13. Inspect the ND filter for a secure fitting in the focus grip.</p> <p>14. Inspect the neck strap and pouch for frayed material, damaged stitching, loose rivets, damaged clips and adjuster.</p>	
3	<p>Optical condition</p> <p>a. ND filter</p>	<p>EMER T & M A 028 Chap 504 Table 2 Serial 1 (e)</p>	<p>1. Remove the ND filter from the focus grip and inspect for surface damage to both sides.</p>	

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SCHEDULE (continued)

Serial (1)	Test/operation (2)	Reference (3)	Field (4)	Result (5)
3 (cont)	a. cont	Table 2 Serial 1(e)	2. Inspect for crazing/blooming. Look through the filter and gauge the loss of transmission due to imperfection. Loss to be minimal.	
	b. Objective assembly	Table 2 Serial 1(a)	1. Inspect the objective assembly for cracks, chips, displacement or loose items.	
		Table 2 Serial 1(c)	2. Inspect bloomed surfaces for scratches, damage or defective blooming.	
		Table 2 Serial 1(d)	3. Inspect all internal components for fogging, filming, fungus, dirt or metal particles.	
	c. Eyepiece assemblies	Table 2 Serial 1(b)	1. Inspect the eyepiece assemblies for cracks, chips, displacement or loose items.	
		Table 2 Serial 1(c)	2. Inspect bloomed surfaces for scratches, damage or defective blooming.	
		Table 2 Serial 1(d)	3. Inspect all internal components for fogging, filming, fungus, dirt or metal particles.	
		AESP-5855-G-100-523 Para 58	4. Using the leak detector kit, item 5 of Table 1, pressure test the eyepieces inspecting for leaks around the eyepiece lens seal. Leak rate to be as in Cat 523 Para 58.	

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SCHEDULE (continued)

Serial (1)	Test/operation (2)	Reference (3)	Field (4)	Result (5)
3 (cont)	d. Collimator assembly NOTE This inspection should be carried out when tests in Serial 5(d) and 5(e) of this schedule indicate a collimator fault.		1. Inspect the collimator for security in its housing and for adhesion of the potting medium. 2. Inspect the collimator for cracks, chips and displacement. 3. Inspect the bloomed surfaces for scratches, cracks or defective blooming. 4. Inspect all components for signs of condensation, filming, fogging, fungus or dirt. 5. Inspect the cemented interface of the collimator for ageing of the cement. Inspect for discolouration, surface ripple and loss of transmission. 6. Inspect the LED for security of adhesion to the collimator. 7. Inspect the solder joints from the LED to the tag board. 8. Inspect all wiring for soundness of insulation, solder joints, connectors. 9. Inspect the two resistors for clarity of markings, damage to surface coating and security of connecting wires.	

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SCHEDULE (continued)

Serial (1)	Test/operation (2)	Reference (3)	Field (4)	Result (5)
4	<p>Functional tests</p> <p>a. Eyepiece operation.</p> <p>b. Objective operation.</p> <p>c. Tube operation. Tests can be carried out in normal ambient light provided that the ND filter is fitted.</p>	AESP 5855-G-100-513 Para 11	<p>1. The movement of each eyepiece shall be smooth and firm. Range of movement shall be $\pm 90^\circ$ minimum from the horizontal position.</p> <p>2. If it is not then eyepiece is to be removed to inspect for damage to the sealing ring, the eyepiece bearing ring or the rear of the collimator.</p>	
		AESP 5855-G-100-523 Para 9	<p>1. Rotate the objective lens assembly between its limits of travel. The angle through which the assembly can be turned should not be greater than 320°. This movement should be smooth and firm.</p>	
		AESP 5855-G-100-523 Para 3	<p>2. If not, remove the objective lens assembly and examine the focusing thread, the roof seal and the front of the tube housing for damage or dirt.</p> <p>3. Ensure that the focus stop pin is secure and undamaged.</p>	
		AESP 5855-G-100-513 Para 6	<p>1. Fit battery and turn switch to position 1 and check that the goggles are operating.</p>	

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SCHEDULE (continued)

Serial (1)	Test/operation (2)	Reference (3)	Field (4)	Result (5)
4 (cont)	c. cont		2. The entire field of view should be evenly illuminated.	
			3. Flashing pinpoint of light and blemishes/blackspots should be less than that defined in the blemish chart given in CAT 513, Fig 2.	
	d. LED/IRE operation.	AESP 5855-G-100-513	1. Turn switch to position 2 and check that the goggles are operating.	
		Para 12	2. Turn switch to 'OFF' position and back to position 2. Ensure that the goggles switch off at the 'OFF' position and back on at position 2.	
		Para 14	3. Look through the goggles at the plane mirror in the lid of the test equipment case and focus the goggles on their own reflection.	
			4. The IRED diode should be visible in the mirror as a bright point of light.	
			5. The LED (red) should be visible in the field of view and in both eyepieces. Switch the goggles off.	

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SCHEDULE (continued)

Serial (1)	Test/operation (2)	Reference (3)	Field (4)	Result (5)
5	<p>Specification tests</p> <p>a. Eyepiece focus. The special to type test equipment should be set up and adjusted as detailed in Cat 513 Para 18 and 19.</p> <p>b. Objective focus (Infinity)</p> <p>c. Resolution.</p>	<p>AESP 5855-G-100-513</p> <p>Para 18 to 20</p> <p>Para 21</p> <p>Para 25</p> <p>Para 25</p>	<p>All tests to be carried out in a darkened room with the ND filter removed and GP Collimator filter bank 1 set to position 1 and filter bank 2 to position B.</p> <p>1. Mount the goggles onto the collimator. Switch to position 1 and adjust the eyepiece inter-ocular distance.</p> <p>2. Looking at the centre of the exit pupil and adjust the dioptrescope for best focus. The eyepieces setting must be between -1.5 and -2.1 dioptres. Differences between eyepieces not to exceed 0.3 dioptres.</p> <p>1. Set the collimator at infinity and focus goggles on the graticule pattern. Ensure that the objective focus passes through infinity.</p> <p>1. Ensure that the collimator is set at infinity and goggles adjusted for best focus.</p> <p>2. The fan pattern should be resolved to a point halfway from A to B. (Cat 513 Fig 4).</p>	

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SCHEDULE (continued)

Serial (1)	Test/operation (2)	Reference (3)	Field (4)	Result (5)
5 (cont)	c. cont			
	d. Convergence	Para 30-55	3. Check that blemishes/black spots and tube noise do not affect resolution. 1. Measure the differences in horizontal position of the grat intersection in the left and right hand channels. Difference shall be less than 12 mils.	
	e. Supravergence	Para 30-55	1. Measure the difference in vertical position of the grat intersection in the left and right hand channels. Difference shall be less than 9 mils.	
	f. Image position	Para 30-55	1. The graticule intersection shall be within ± 45 mils horizontally.	
		Para 30-55	2. The graticule intersection shall be within ± 45 mils vertically.	
	g. Objective focus	Para 26	1. Remove goggles from the collimator and rotate objective lens fully clockwise viewed from eyepiece and move goggles relative to any target for best focus. Measure distance from object to eye position. Distance shall be equal, to or less than, 400 mm.	
			2. Switch off goggles, replace ND filter.	
Date		Signature	Sentence (see Sub para 1.2)	

SCHEDULE
(continued)

Serial (1)	Test/Operation (2)	Reference (3)	Field (4)	Result (5)
5 (cont)	h. Blemishes	Para 7	Check that the blemishes on the tube do not exceed the size and quantity indicated on the Test Chart (fig 2).	
<div style="display: flex; justify-content: space-between;"> <div>Date.....</div> <div>Signature.....</div> <div>Sentence..... (see sub para 1.2)</div> </div>				

