GROUP A AND B - ARMAMENT AND PHOTOGRAPHIC

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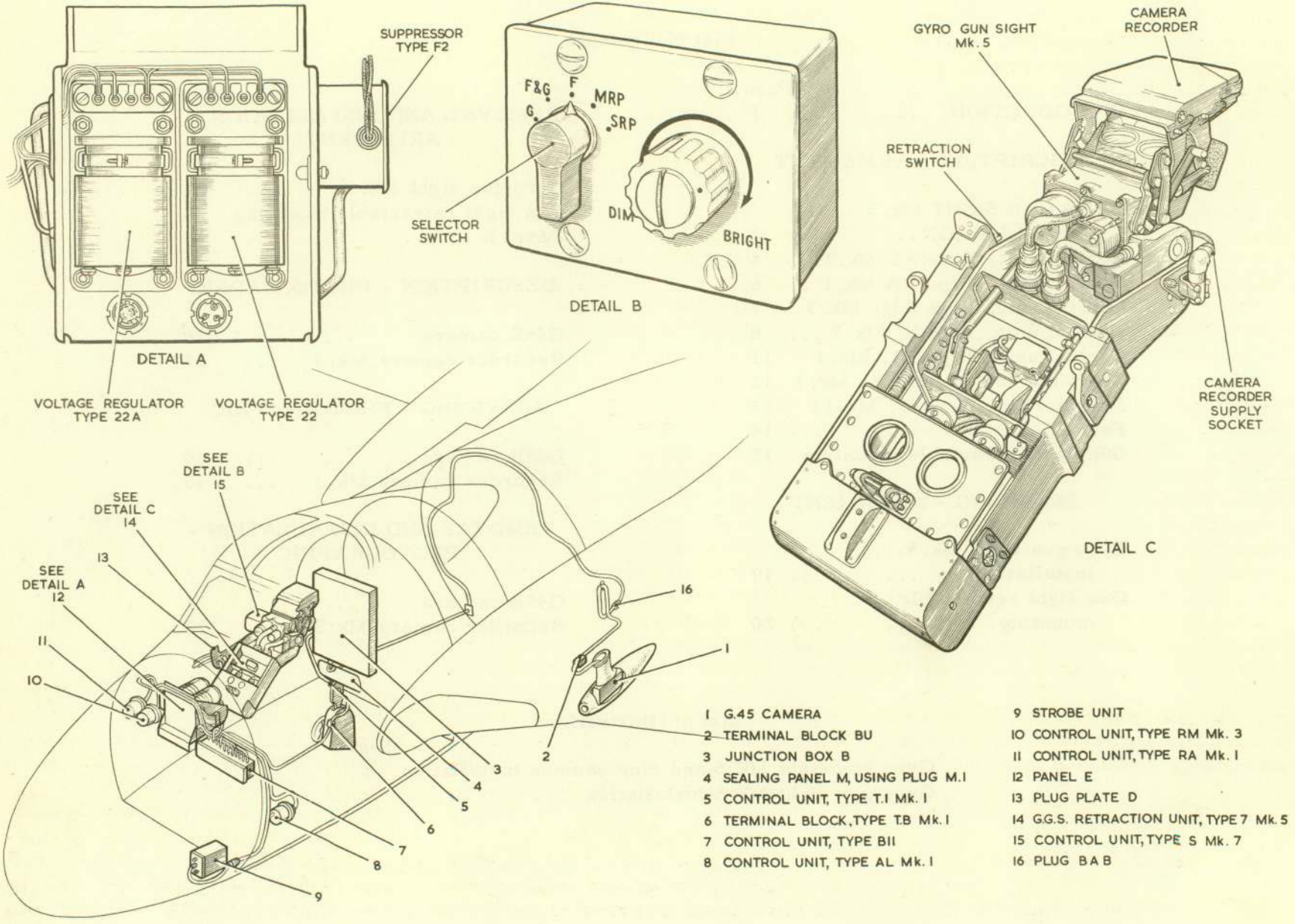

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Fig. 1 Gyro gun sight Mk. 5 and ciné camera installation

RESTRICTED

INTRODUCTION

1. This group describes the armament and photographic equipment installed in the aircraft together with servicing notes and removal instructions for equipment in difficult locations and where extra care is necessary to avoid damage. The information concerning units and components is brief in nature and should be read in conjunction with the specialist Air Publications mentioned in the text.

DESCRIPTION - ARMAMENT

GYRO GUN SIGHT Mk. 5

INSTALLATION

2. The gyro gun sight Mk. 5 is an electrically-operated predictor for use with fixed guns and rocket projectiles. The gun sight is mounted on a retractable mounting Mk. 5, Type 7 and the electrical circuit is arranged for automatic caging and for cameras to operate when sighting rocket projectiles. The gun sight is described at length in A.P. 1275E, Vol. 1, Sect. 5, Chap. 5. The illustration (fig. 1) in this group shows the location of equipment in the aircraft.

3. The gun sight has the following associated equipment listed below and individually described in the text :-

(1) Control unit, Type AL Mk. 1

(2) Control unit, Type BL Mk. 1

(3) Control unit, Type RA Mk. 1

(4) Control unit, Type RM Mk. 3

(5) Control unit, Type S Mk. 7

(6) Control unit, Type T1 Mk. 1

(7) Terminal box, Type TB Mk. 1

(8) Junction box, Type B Mk. 11

Control unit, Type AL Mk. 1

4. This is an electrically-controlled altitude compensation unit coupled into the static line of the A.S.I. system. Atmospheric pressure changes due to change in altitude expands, or contracts a capsule inside the unit which in turn controls the traverse of wipers over the contacts of two sets of resistors.

5. These resistors are connected into the range and gravity circuits of the gyro gun sight, thus modifying the currents in the gyro deflection coils so that aiming-off allowances are compensated for, due to the effect of change in the altitude at which the sight is operated. The ratio between the travel of the capsule and that of the wipers is variable to permit the use of the unit with ammunition of different ballistic co-efficient. The unit is strapped to the port side of the nosewheel tunnel as shown in fig. 1.

Control unit, Type RA Mk. 1

6. The control unit, Type RA Mk. 1, is a relay amplifier and is situated on the rear face of bulkhead 1, starboard side. A full description of the unit is contained in A.P. 1275E, Vol. 1, Sect. 5.

Control unit, Type RM Mk. 3

7. The RM Mk. 3 control unit is mounted adjacent to the RA Mk. 1 unit on the starboard rear face of bulkhead 1. The unit is set-up prior to flight for radar or manual operation of the gun sight.

Control unit, Type S Mk. 7

8. Known as the selector-dimmer, this unit is located on the starboard of the gun sight on panel V under the direct control of the pilot. The unit contains two components; a five-position, selector switch and a dimmer mounted side by side on the box cover.

9. The dimmer knob position is defined by a white dimple on its edge. Turning the knob increases or decreases the brilliance of the graticule illumination according to the direction of rotation.

10. The selector switch has five positions, marked G, F and G, F, M.R.P. and S.R.P., signifying respectively, Gyro, Fixed and Gyro, Fixed, Medium Rocket Projectile and Steep Rocket Projectile. With G.F and G, or F, selected, the sight can be used for aiming the fixed guns. The M.R.P. and S.R.P. positions are selected when rocket projectiles are to be used.

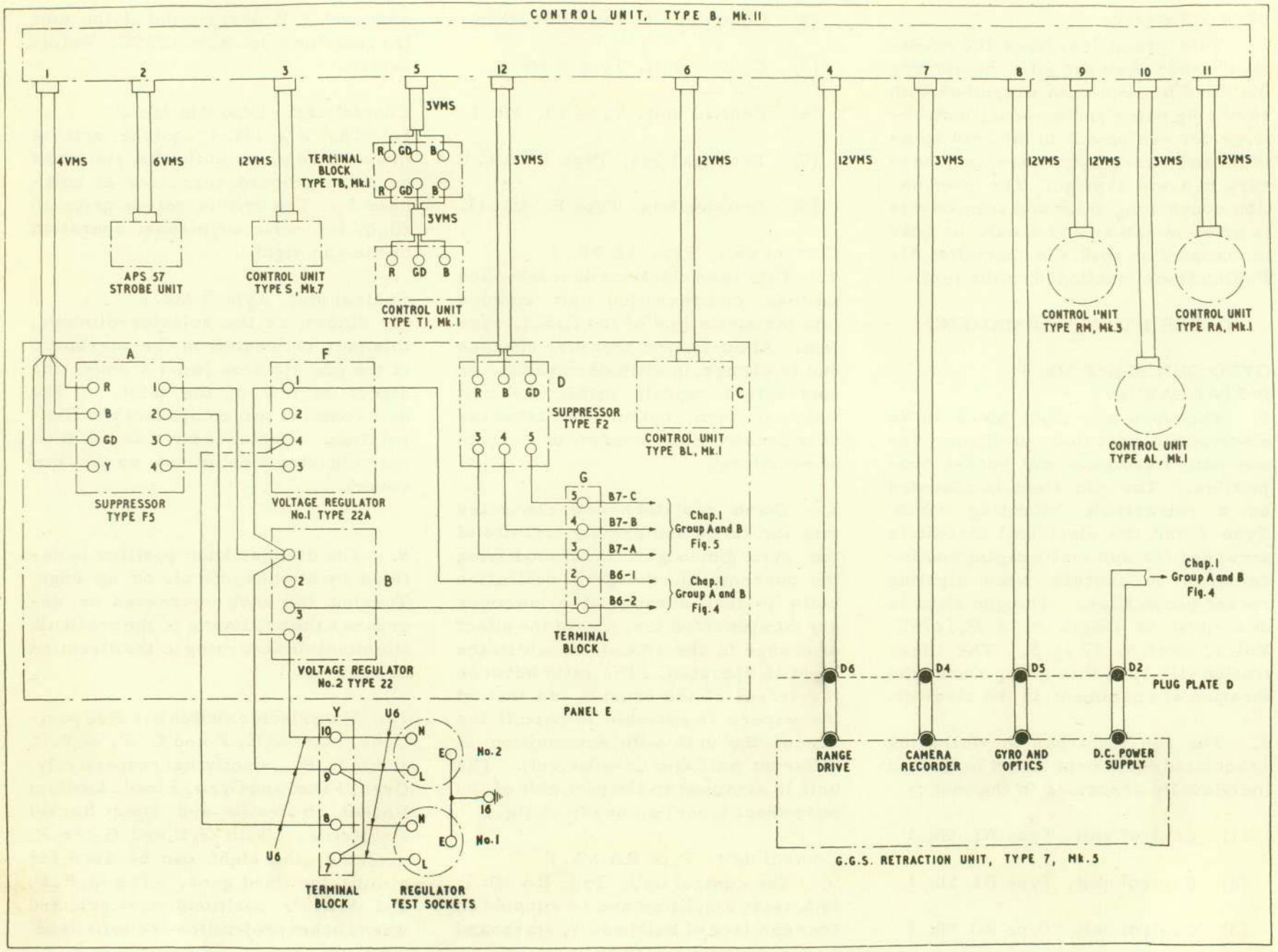

Fig. 2. Gyro gun sight Mk.5 installation

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Control unit, T1 Mk. 1

11. This is the manual control for the gun sight and comprises a potentiometer built into the throttle twist grip which feeds a varying voltage to the relay amplifier unit, via the main junction box, Type B Mk.11, described in para. 13.

Terminal box, Type TB Mk. 1

12. This unit is a three-way terminal block which connects the cable from the twist grip throttle control to a cable from the main junction box for the gun sight installation.

Junction box, Type B Mk. 11

13. Each control unit is connected to this junction box which is mounted on the rear face of bulkhead 1, port side. The cores of each cable passing into the junction box are connected to the screw terminals on the block and a label on the inside of the junction box lid shows the appropriate terminals for each cable entering the box.

Panel E

14. The control panel E is mounted on the rear centre face of bulkhead 1 and it contains the following units :-

(1) Control unit Type BL Mk. 1 - ballistics unit, pre-set according to the type of ammunition used.

(2) Voltage regulators, Type 22 and 22A (described in A.P. 4343B, Vol. 1, Sect. 1).

(3) Suppressor, TypeF5 (described in A.P. 4343C, Vol. 1, Section 5).

(4) Suppressor, Type F2 (described in A.P. 4343C, Vol. 1, Section 5).

Test sockets for each voltage regulator are located on the starboard side of the cabin.

Gun sight retractable mounting

15. A Mk. 5 Type 7 retractable gun sight mounting is fitted, the function of which is to withdraw the gyro gun sight from the extended, or combat position during normal flight. A manual release knob is provided for emergency use, which when struck with the palm of the hand, permits the gun sight and carriage to fall back to the retracted position where it is positively locked by a gravity lock. The release knob must not be used for normal retraction as this involves re-setting the retraction mechanism. Under emergency conditions when using the ejector seat the G.G.S. in the combat position forms an obstruction. When the canopy is jettisoned a micro switch is operated by the canopy jettison mechanism, completing an electrical circuit to automatically retract the G.G.S. mounting.

16. The wiring diagram (fig. 4) is contained in Section 5, Chapter, 1, Group A and B of this publication.

The supply to the retractable mounting is through a 5 amp. circuit breaker located on the starboard console panel.

17. The up and down movement of the retractable mounting is controlled by a two-way, double-pole selector switch on the right of the unit. When UP is selected, a supply is made to the up field of the motor through contacts 2 and 3 of the double-pole selector switch. At the same time, a supply is placed through contacts 5 and 6 of the switch to the G.G.S. voltage regulators, Type 22 and 22A on panel E.

18. When DOWN is selected, a circuit is completed to the down field of the motor via the normally closed contacts 1 and 2 of the emergency switch, and contacts 1 and 2 of the selector switch; the motor operates and the mounting is retracted. As the mounting reaches the limit of its travel, the integral switch contacts in the down field circuit open, and the motor stops. The up limit switch contacts close, ready for the next selection.

SERVICING - ARMAMENT

Gyro gun sight Mk. 5 installation

19. The full servicing procedure and overhaul instructions for this installation are contained in A.P.1275E, Vol. 1, Sect. 5. Should the necessity to dismantle or repair the equipment exceed the instructions given in the Air Publication, the faulty unit must be

returned to the appropriate Maintenance Unit. (Two spare filaments are contained in holders in panel G on the port side of the cabin). The equipment mounted on Panel E is accessible after the following has been carried out :-

(1) Remove the radar console unit as described in Section 6, Chapter 2 of this publication.

(2) Lower the instrument panel as described in the General Information Group of this chapter.

Gyro gun sight retractable mounting

20. All electrical leads and cables should be examined for signs of deterioration of damage and all plugs and sockets must be intact and free from corrosion. The carriage should be extended and retracted several times to ensure that the cables do not foul the adjacent aircraft structure or equipment, whilst the carriage is in motion. The first and second line servicing procedures for the retractable mounting are fully described in A.P.1275E, Vol.1, Sect.6.

REMOVAL AND INSTALLATION - ARMAMENT

Gyro gun sight Mk.5

21. To remove the gyro gun sight from the retractable mounting, adopt the following procedure :-

(1) Operate the selector switch to extend the carriage.

(2) Render the aircraft electrically safe as described under General Information in Chap.1 of this section.

(3) When fitted, disconnect and remove the camera recorder from its mounting above the gun sight and secure the recorder socket in its spring clip on the retractable mounting.

(4) Disconnect the gun sight range control (red plug).

(5) Disconnect the gun sight gyro and optical plug (green).

(6) Give the star nut locking pin on the forward face of the mounting a quarter turn and pull it out slightly.

(7) Unscrew the star nut beneath the sighting head, and remove the gun sight from its mounting.

22. To fit the gun sight to the retractable mounting, proceed as follows :-

(1) Connect the range control plug (red) to the socket (identified by a red spot) on the mounting.

(2) Connect the gun sight gyro and optical (green) to the socket (identified by a green spot) on the mounting.

(3) Engage the gun sight spigot bolt in the hole in the mounting.

(4) Screw on the star nut from below.

(5) Lock the star nut with the locking pin on the front face. The pin requires a quarter turn before it will push in.

(6) Attach the camera recorder to its mounting and connect the supply socket.

(7) Re-harmonize the gun sight according to the instructions laid down in Section 7 of this publication.

Gun sight retractable mounting

23. To remove the gun sight retractable mounting from the aircraft, proceed as follows :-

(1) Render the aircraft electrically safe as described under General Information in Chap.1 of this section.

(2) Remove the gyro gun sight and recorder from the retractable mounting in the manner described in para. 26.

(3) Release the four Oddie fasteners securing the instrument panel and then lower the panel rearwards and downwards on its lower bearing hinges.

(4) Disconnect and remove the GM4F compass indicator.

(5) Disconnect all plugs and sockets passing from the retractable mounting to the diaphragm (Panel D).

(6) Remove the wire locking from the two aft fixing bolts securing the mounting to the aircraft structure. Unscrew and remove the bolts, taking care to support the weight of the mounting.

(7) Unscrew the nut securing the fixing bolt at the base of the mounting and withdraw the bolt.

(8) The retractable mounting may now be removed from the aircraft. When this operation is carried out, ensure that the leads passing down the side of the unit do not foul the adjacent aircraft structure.

24. When refitting the retractable mounting, reverse the removal procedure, at the same time observing the following points :-

(1) Ensure that the jettison handle is wire-locked to the mounting.

(2) After refitting the retractable mounting and replacing the instrument panel, carry out a functional check on the retractable mounting and GM4F compass indicator.

Note...

If the mounting is inadvertently jettisoned, the motor must not be operated in this position. The retractable mounting must be reset according to the instructions laid down in the relevant Air Publication.

Panel E

25. The removal of panel E from this aircraft is not straightforward, but should the occasion arise, adopt the following procedure :-

(1) Lower the instrument panel after releasing the four Oddie fasteners securing it to the mountings.

(2) Remove the radar console unit (see Sect. 6, Chap. 2 of this publication).

(3) Disconnect all the plugs and sockets on panel E and also the connections to the voltage regulators from the test sockets.

(4) Disconnect the leads to terminal block G.

(5) Disconnect and remove the GM4F compass inverter.

(6) Remove the main cable loom in the channel fitted to panel E.

(7) Detach the screws securing panel E to the bulkhead at the same time supporting the weight of the panel.

Refitting is the reverse of removal.

DESCRIPTION - PHOTOGRAPHIC

G45B camera

26. The G45B cine camera is contained in a streamlined housing mounted on the underside of the port wing and is used for either training in air gunnery, or for recording the effects of actual gunfire on a target. The camera is driven from an electrical supply (described in Groups A and B, Chapter 1 of this section) and is coupled to the gun firing control in order that a continuous cinematograph record is obtained while the gun firing switch is pressed. The synchronizing of the camera with the guns is described in Section 7 of this publication. Further information describing the G45B camera will be found in A.P.1355D, Vol. 1, Sect. 1.

Recorder camera Mk. 3

27. The recorder camera is mounted above the gyro gun sight and is electrically-operated to produce a series of photographic records of the target and gun sight graticule without interfering with the normal use of the gun sight. When the gun firing push button on the control column is pressed, pictures are taken to provide an easily assessable record of the ranging and tracking of the guns.

28. The mechanism of the camera can be set to take pictures at the rate of two or sixteen frames per second according to the position of the rate control on the rear left hand side of the casing. The exposure time can be selected at 1/50th, 1/100th or 1/300th of a second by an appropriate movement of the three-position control at the front of the casing. The aperture control, situated on the right hand side of the rear of the casing, can be moved over a range marked F1.9, 2.8, 4, 5.6, 8 and 16. For further information reference should be made to A.P.1355D, Vol.1, Sect.3.

SERVICING - PHOTOGRAPHIC

G45B camera

29. The G45B camera must be treated as a precision instrument and, as such must be maintained in a high degree of cleanliness. This if of importance with parts which come into contact with the sensitive film, if clear steady pictures free from dirt and abrasion are to be obtained. Grit and water, or excess oil are the most probable causes of unsatisfactory results apart from actual mechanical or electrical failure. When the aircraft is not in use, the shutter must be closed, and it is recommended that the lens opening in the streamlined housing be covered by an adhesive patch or other closure. Full servicing information will be found in A.P. 1355D, Vol.1, Sect.1).

Recorder camera Mk. 3

30. Not unlike the G45B cine camera, the recorder is a precision instrument and as such, must be handled carefully during removal, servicing, or refitting. Information appertaining to its servicing and overhaul will be found in A.P.1355D, Vol.1, Sect.3. The recorder camera in position can cause deviation of the E2A compass.

REMOVAL AND INSTALLATION - PHOTOGRAPHIC

G45B camera

31. To remove the camera from its streamlined housing, adopt the following procedure :-

(1) Remove the six 2BA csk/hd. screws securing the rear fairing and then detach the fairing.

(2) Render the aircraft electrically safe (as described in the General Information group of Sect.5, Chap.1 of this book). Then disconnect the 7-pole socket at the rear of the camera.

(3) Unscrew the two hex./hd. bolts securing the rear fixing plate to the camera mounting and remove the fixing plate.

(4) Carefully slide the camera from its mounting. To refit the camera, reverse the removal procedure.

Recorder camera Mk. 3

32. The recorder camera is secured by four side clips fitted to the body of the camera. These clips engage with four brackets on the gyro gun sight case. To remove the camera, diaconnect the camera supply socket and place it in the stowage clip provided at the side of the retractable mounting. The camera then slides backwards and disengages from the side clips. When refitting the camera recorder, reverse the removal procedure.