

## Group 4.A

## GYRO GUN SIGHT AND CAMERA RECORDER

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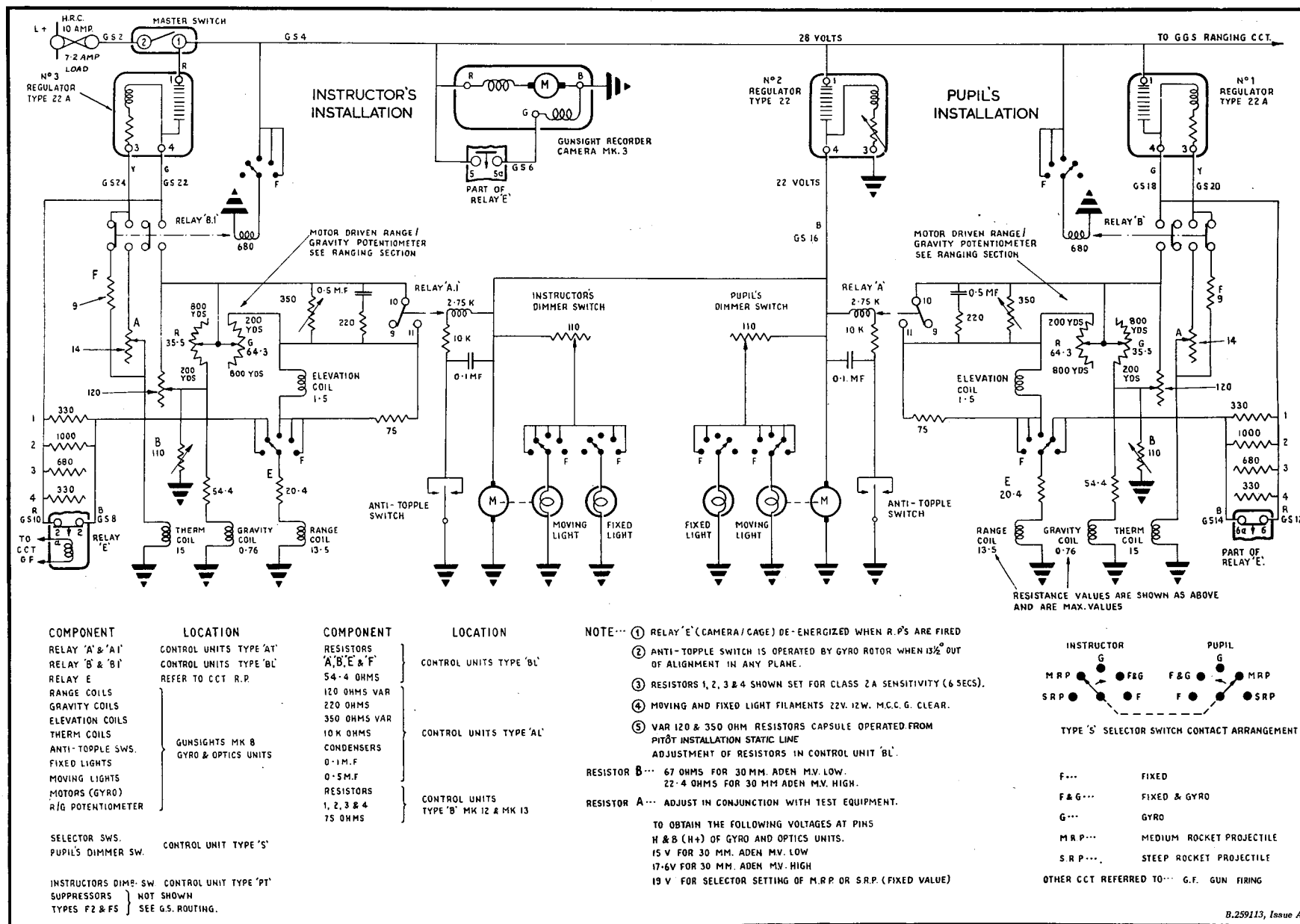


Fig.1. Gyro gun sight and camera recorder (gyro and optics theoretical)

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**Introduction**

1. This group contains a description of the gyro gun sights and camera recorder installed in this aircraft, together with details of the gun sight mounting structure. Routeing and theoretical diagrams of the installations are also included. For a general description of the aircraft's instrument installation as a whole, reference should be made to Group 1.A. The location and access to all the instruments and their associated equipment is given in Group 1.C. Detailed information on the standard components used, together with the servicing information necessary to maintain them in an efficient condition, will be found in the appropriate Air Publications quoted in Table 1.

**DESCRIPTION****Gyro gun sights***General*

2. A dual gun sight installation, which is designed to give the pupil training under flight conditions in the correct handling of the gun sight, is installed in this aircraft. The sights are carried on fixed mountings as described in para. 11 and provision is made for the fitment of a camera recorder on to the instructor's sight. When not in use this recorder may be placed in a stowage on the starboard side of the cabin. The sights are both switched on by an ON/OFF master switch located at the top of the centre instrument panel adjacent to the pupil's sight.

3. The two sights are electrically connected and the graticule displays are identical. The instructor, therefore, can observe in the reflector of his own sight whether the pupil has set the controls appropriately and is "ranging" and "tracking" correctly, or the pupil can observe in his sight the graticule display produced when the instructor is operating the controls.

4. The installation contains several control units, some of which are pre-set prior to combat and others which are adjusted during combat. The gun sights, camera recorder and control units are all interconnected by suitable cables to a pair of junction boxes, which are mounted on the aft face of frame 7 one on each side of the cabin.

◀ **Note ...**

*The gyro gun sights, their associated mountings and the cables marked in Fig.3 are removed from the aircraft when Mod.1372 (IFF/SSR) is incorporated.* ▶

**TABLE 1****Equipment type and Air Publication reference**

Equipment Type	Air Publication
◀ Gyro gun sight, Mk.8 ( <i>pre Mod.1372 only</i> ) ▶	
Gyro gun sight junction boxes, Type B, Mk.12 and 13	
Instructor's selector/dimmer, Type PT, Mk.2	
Pupil's selector/dimmer, Type S, Mk.6	
Ballistics unit, Type BL, Mk.1	
Anti-topple units, Type AT, Mk.1	
Radar/manual units, Type RM, Mk.3 or Mk.3A ( <i>Mod.1339</i> )	
Manual ranging controls, Type T.1, Mk.2 (incorporating Ferranti Mod.149F.E.) and Mk. 6	
Altitude units, Type AL, Mk.1	
Relay amplifier units, Type RA, Mk.1	
Suppressors, Type F.2 and F.5 ... ..	◀ A.P.112E-0001-1 ▶
Voltage regulators, Type 22 and 22A ... ..	◀ A.P.113D-1902-1 A.P.113D-07122-1 ▶
Gyro gun sight master switch, Rotax Type D.5404 ... ..	A.P.4343C, Vol.1, Book 1, Sect. 1
Camera recorder Mk.3 ... ..	A.P.1355D, Vol.1, Sect.3

*Combat controls*

5. The selector-dimmer, used by the pupil to control the degree of illumination and the type of graticule display of his own sight is mounted on the forward end of the cabin port shelf. To enable the instructor to take over the ranging control of the sights, an instructor/pupil selector-dimmer control unit is provided in the corresponding position on the cabin starboard shelf. This control unit also carries the control for the illumination of the instructor's sight.

6. When the instructor/pupil selector-dimmer control unit is set to the PUPIL position, manual ranging control of both

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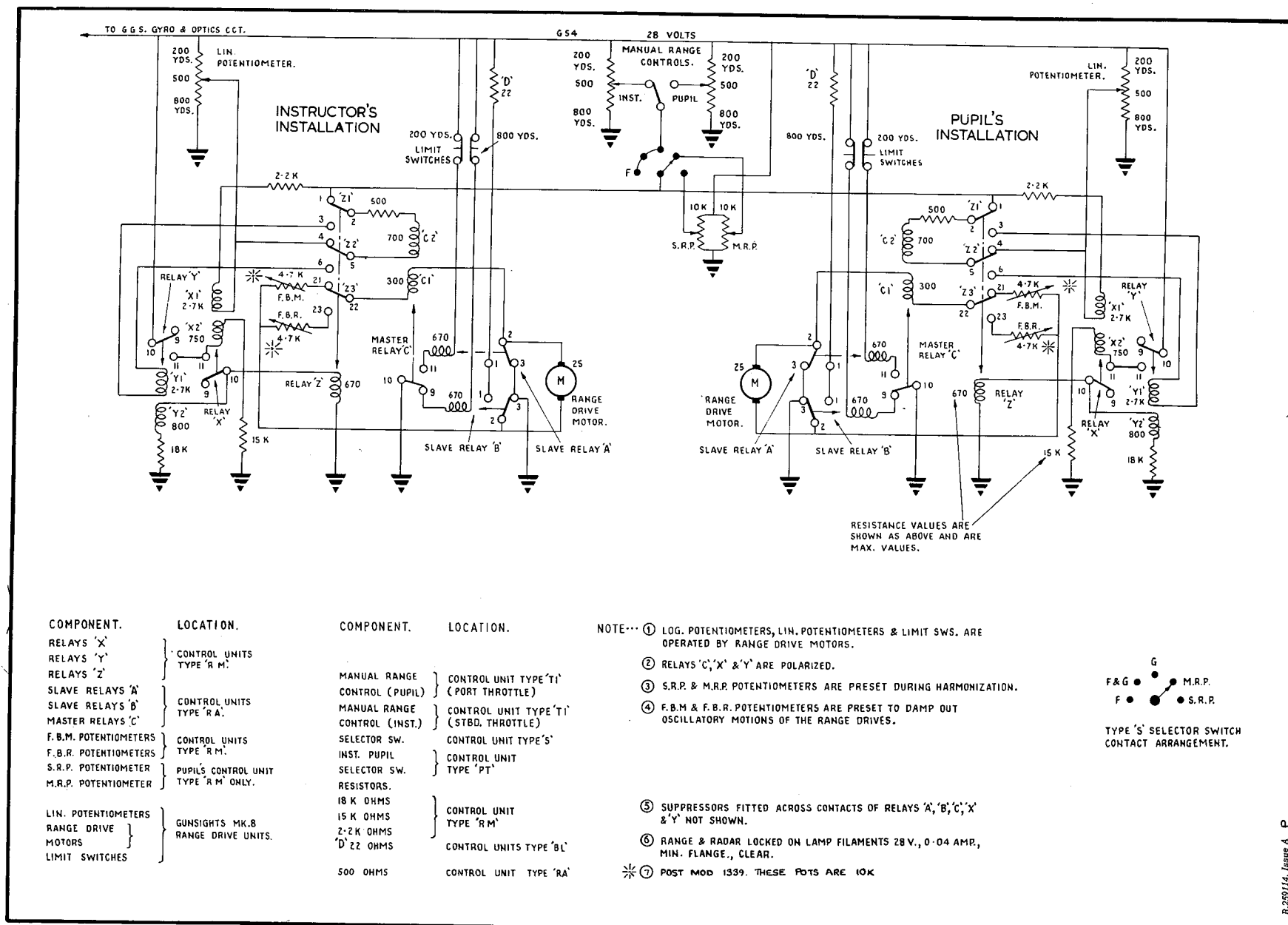


Fig. 2 Gyro gun sight and camera recorder (ranging theoretical)

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sights is effected by a control unit which forms the twist grip at the top of the pupil's throttle lever, but when the control is in the INSTRUCTOR position, manual ranging of both sights is accomplished by a further control unit forming the twist grip of the instructor's throttle lever. A radar/manual control unit for each sight is fitted to a platform between frames 12 and 13 on each side of the cabin. These control units carry various potentiometers necessary to the circuit, but do not fulfil their true function as no radar ranging is fitted to the aircraft.

**Note . . .**

*Mod.1339 alters the feed back resistor in the radar/manual control unit from 4.7 kilohms to 10 kilohms. This makes the radar/manual control unit Type R.M. a Mk.3A.*

**Pre-set controls**

7. To compensate for the effect of changes in altitude at which the installation is operated and to cover the aiming allowances required due to the different types of ammunition used, each gun sight is provided with an altitude unit and a ballistics unit. The altitude units are located on the aft face of frame 6 forward of the junction boxes and the ballistics units are situated below the cabin port and starboard shelves. The altitude units are connected to the pressure head installation, which is described in Group 3.A. The altitude and ballistics units are both pre-set before flight according to the type of

ammunition carried. The installation incorporates a pair of relay amplifiers, one for each sight, which control the range drive motors according to the ranging system selected by the control units. These amplifiers are located on mounting platforms attached to the cabin floor below each altitude unit. A pair of anti-topple units, one for each sight, which automatically re-erect the gyro units should they topple due to aircraft manoeuvres, are also provided and these are mounted together on a platform attached to the cabin floor aft of the pupil's ejection seat.

**Power supplies**

8. The power supply is obtained from a fuse in J.B.2, which feeds the gyro gun sight master switch. To ensure that a constant voltage, on which the performance of the whole computing system depends, is supplied to the sights and control units, this main supply is fed through one Type 22 and two Type 22A voltage regulators. The three regulators are located together behind the pupil's ejector seat, two being carried one above the other in a mounting attached to the cabin floor, while the third is attached to a mounting on the floor just inboard of the others. The Type 22 regulator is provided with a pre-set voltage control, but the output of the Type 22A regulators is set by a control within the ballistics units. To eliminate radio interference, these regulated supplies are taken through three suppressors, which are carried one above the other two, in a mounting attached to the cabin floor between frames 7 and 8

on the starboard side of the aircraft.

**Camera recorder**

9. The camera recorder, which is fitted only to the instructor's gun sight, is controlled by the gyro caging and camera relay in the camera gun circuit (*Sect.5, Chap.1, Group G.1*). When energized this relay will, if the gun sight installation is switched on, complete the supply to the solenoid of the camera recorder claw mechanism. The claw mechanism will then draw the film across the lens so recording the target and graticule display on the gun sight reflector.

10. Theoretical and routeing diagrams of the gun sight and camera recorder installations are given in fig.1, 2 and 3 of this group. A routeing diagram of the electrical power supplies is given in fig.4 and wiring diagrams of the gun sight junction boxes will be found in fig.5. Reference should be made to the Air Publications quoted in Table 1 for a full description of the gun sights, control units and camera recorder, together with the method of operation.

**Gyro gun sight mountings**

11. The mountings for the gyro gun sights consist of two large castings, which project aft, one on each side of the centre instrument panel. Each casting is bolted at its forward end to the cross beam of frame 7 and is anchored at its centre to the instru-

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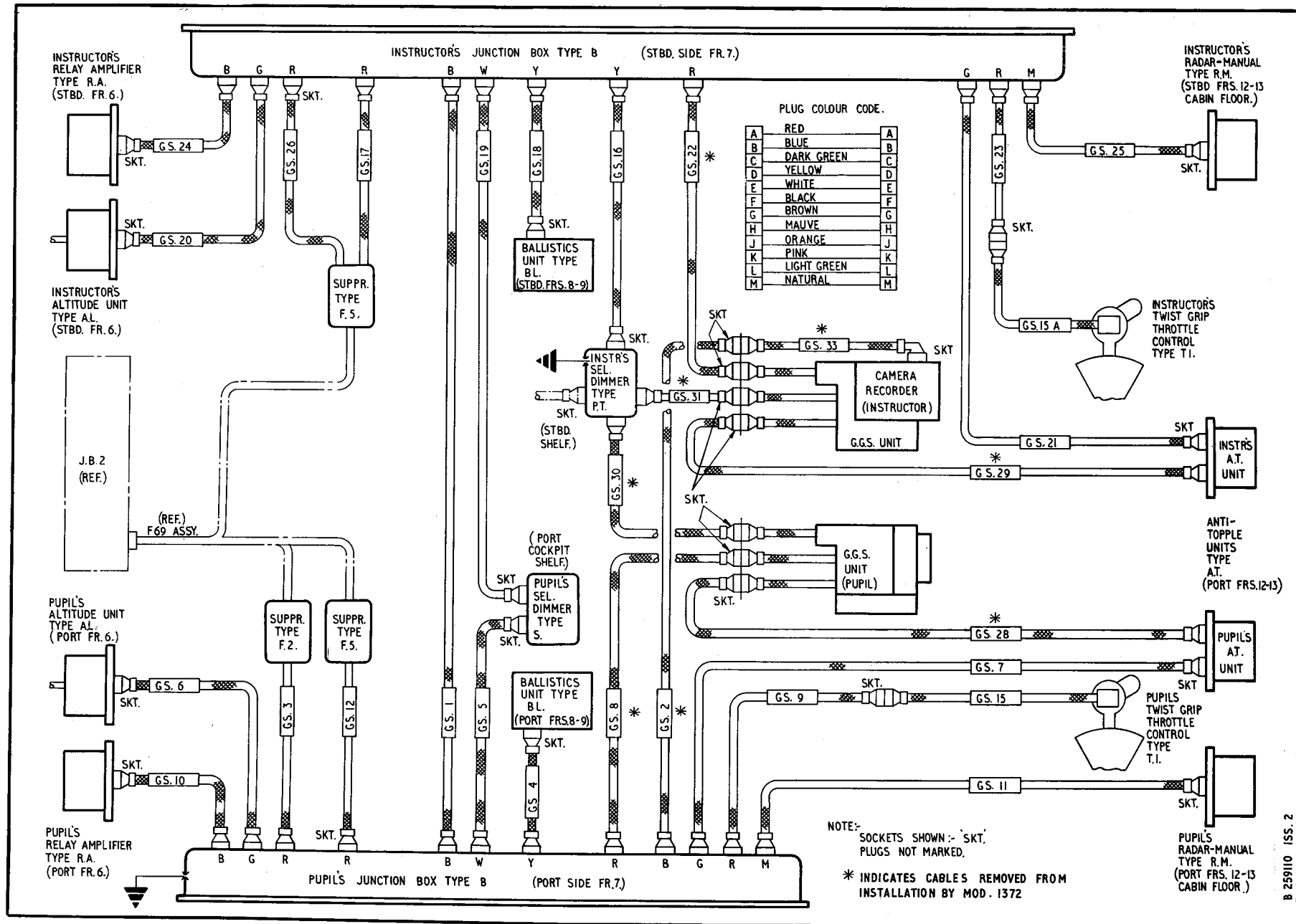


Fig. 3 Gyro gun sight and camera recorder (routing)

◀ (Mod.1372 added) ▶

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A.P.101B-1306-1B, Sect. 5, Chap. 2, Group 4.A  
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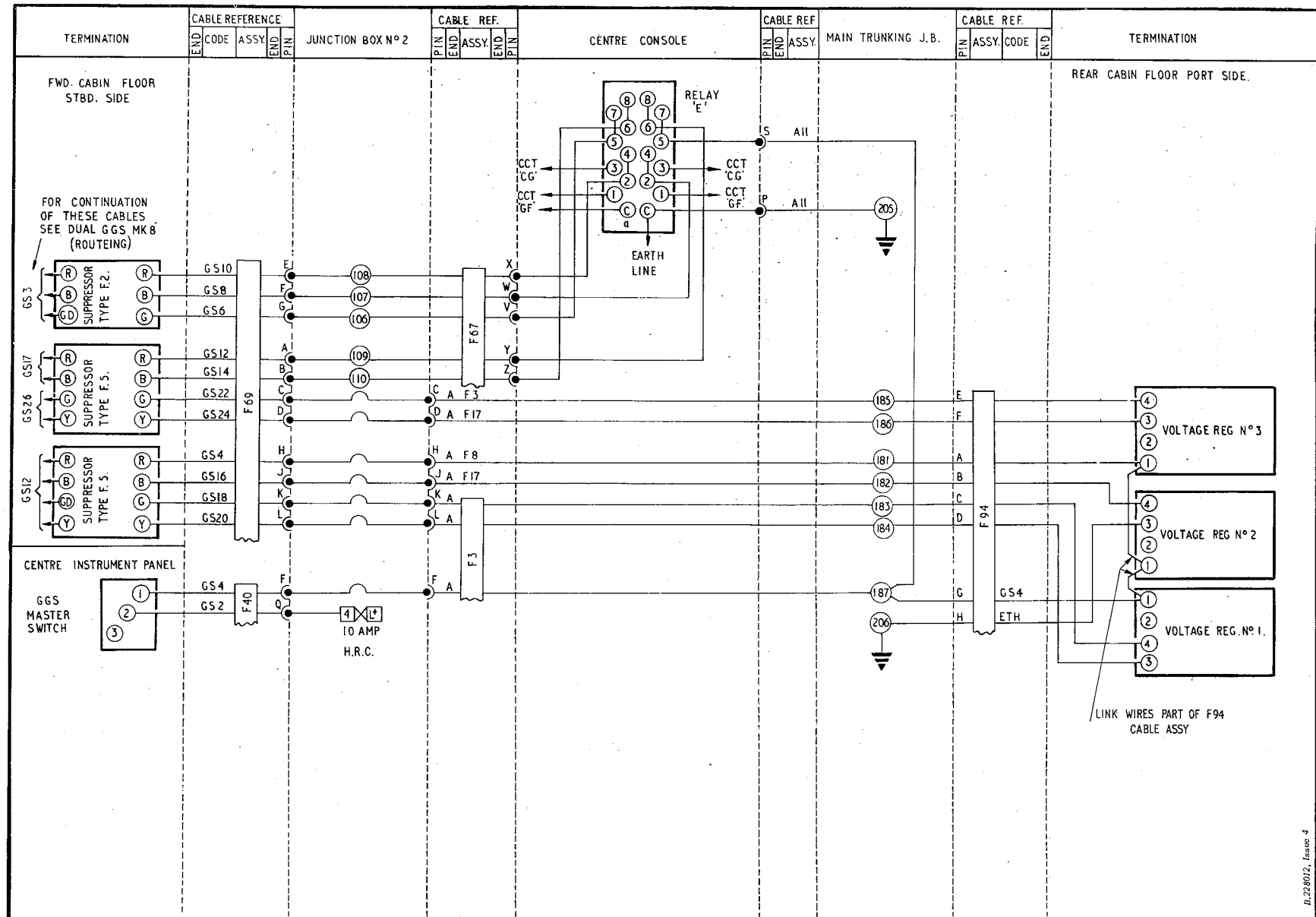


Fig.4. Power supply for gyro gun sight and camera recorder (routing)

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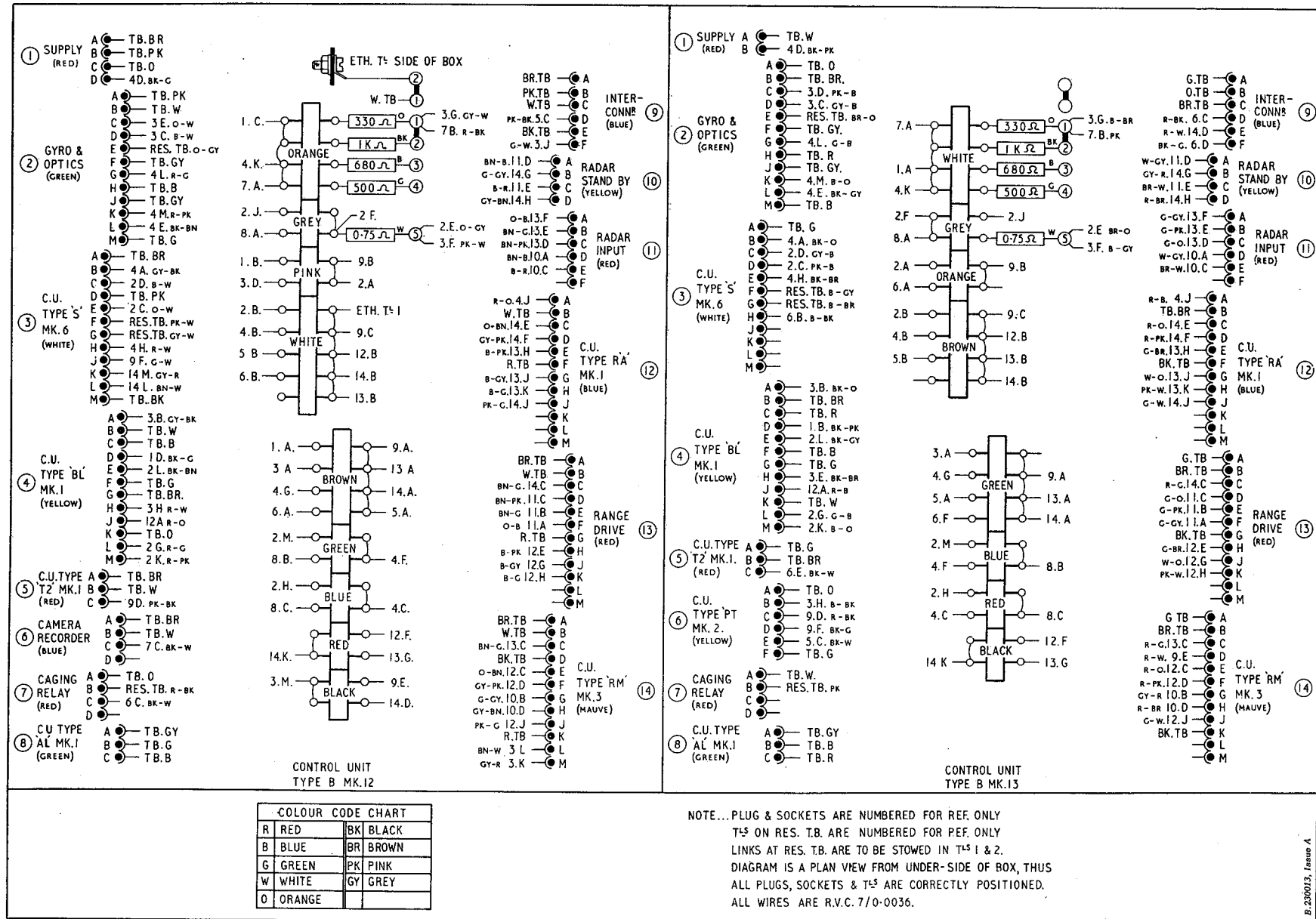


Fig. 5. Wiring of gyro gun sight junction boxes



ment panel mounting tube extending across the top of frame 8. The seating faces at the rear end of each casting, to which the gun sights are attached, incorporate light-alloy profile packing pieces for the initial alignment of the gun sights.

#### **SERVICING**

##### **General**

12. The necessary servicing required to

maintain the gun sights, control units and camera recorder in an efficient condition and the standard serviceability tests which should be applied, together with the equipment to be used and the method of conducting the tests is contained in the appropriate Air Publications quoted in Table 1. Before servicing or removing any of these components, the aircraft must be rendered electrically safe as described in Sect.5, Chap.1.

#### **REMOVAL AND ASSEMBLY**

##### **General**

13. The recommended method of removing the gun sights from their mountings is contained in A.P.1275E, Vol.1 and, as the camera recorder is secured to the gun sight by spring-loaded lugs, no difficulty should be experienced in removing this component. Once access has been obtained, the removal of the remaining components should present no unusual difficulties.

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