Appendix 2 MOD.613 - INTRODUCTION OF E.C.M.

LIST OF CONTENTS

LIST OF ILLUSTRATIONS

Introduction

1. This appendix contains information on the changes made to the pitch stabilizer system by the introduction of Mod.613. Descriptive and servicing details are provided, together with a theroetical diagram and routing charts. The power supplies are fully described in Sect.5 Chap.1, Group 2A and 3A of this publication. Also included in this appendix are brief details of new link setting cards for use with the Mk.10 autopilot when fitted in aircraft carrying ECM. equipment.

DESCRIPTION AND OPERATION

PITCH STABILIZER

2. Prior to the introduction of Mod.613 the two pitch stabilizer channels, although separate, were controlled by common switching arrangements. A double-pole switch controlled the supplies to both amplifiers, a single auto height switch controlled the master relay for both channels and a single thermostat controlled the supplies to both servo unit heaters.

3. With the introduction of Mod.613 the two channels are made completely independent of each other. Two single-pole switches replace the double-pole switch. An auto height switch is provided for each channel, and separate thermostats control the supplies to the servo heaters. A description of the new items and their effect on circuit operation is given in the paragraphs that follow.

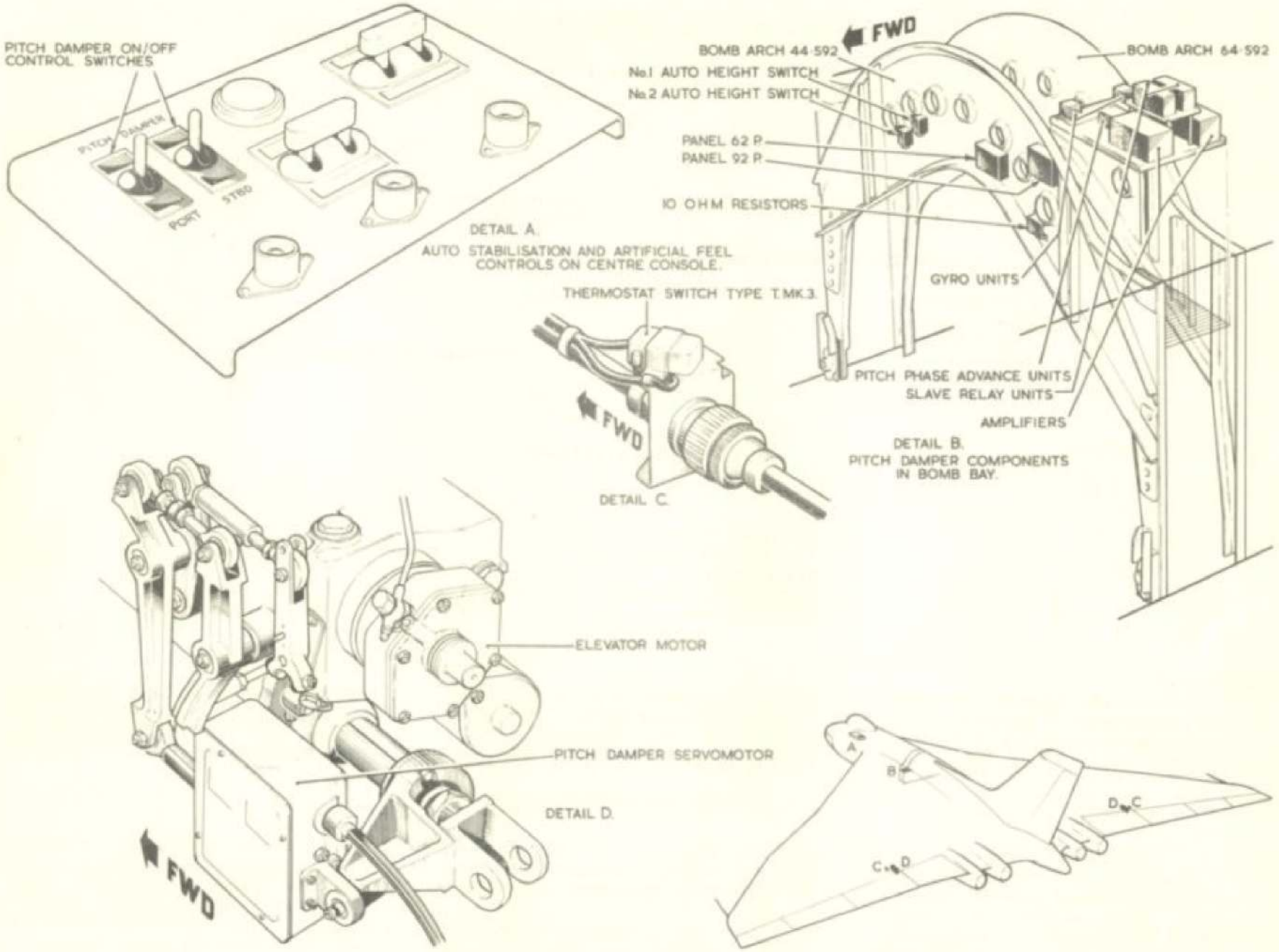

Fig. 1 Component location

Control switches

4. These two switches, labelled PITCH DAMPER-PORT-STBD, are single-pole ON-OFF switches, Ref.No.5CW/6460. Each switch controls, by an associated relay, the d.c. supply to its associated pitch amplifier and at the same time provides a supply to the servo heater circuit. The switches are mounted on the retractable centre console, as shown in fig.1.

Auto height switches

5. The two auto height switches are mounted on the forward face of bomb arch 44. Each switch is connected to the starboard pitot-static system and contains an aneroid capsule and relay. These items control, indirectly, a pair of relay contacts in circuit with the d.c. supply to their associated pitch amplifier. The switches thus prevent operation of the pitch stabilizer at altitudes below 20,000 ft. The switches are shown in fig.1 and fully described in A.P.1469S, sect.4, Chap.1.

Thermostats

6. The supply to the heater element of each servo unit, after leaving the control switch, is fed via a thermostat, Type 3 Mk.2. The thermostats, which are set to operate at temperatures of 0 deg.C and below, are mounted adjacent to their associated servo unit, as shown in fig.1.

Relay panel 92P.

7. This panel is introduced into the bomb-bay to house the additional relays introduced by Mod.613. The panel contains two relays, 707 and 708, which form part of the starboard pitch stabilizer circuit. The panel is shown in fig.1.

Power supplies

8. The power supplies to autostabilizer equipment are shown in fig.2 and it will be seen that the supplies to the mach trim and yaw damper system are unchanged. Supplies to the pitch damper system have been changed to conform with the separate channel arrangement as follows:-

3P Fuse 44 - 28-volt d.c. to port channel control switch.

Fuse 66 - 28-volt d.c. to starboard channel control switch.

16P Fuse 349 - 28-volt d.c. to auto-height switch No.1 (port)

Fuse 315 - 28-volt d.c. to auto-height switch No.2 (starboard)

Fuse 345 - 28-volt d.c. to No.1 (port) amplifier.

Fuse 346 - 28-volt d.c. to No.2 (starboard) amplifier.

22P Fuse 681 - 682 115-volt, 400 c/s a.c. to No.1 (port) amplifier from No.3 inverter

Fuse 721 - 722 115-volt, 400 c/s a.c. to No.2 (stb'd.) amplifier from No.1 inverter

Circuit operation

9. As the port and starboard pitch damper circuits are similar, it will only be necessary to describe the port circuit. The a.c. supply to the amplifier is fed direct to ensure that the gyros are running and that the system is stable for operation when required. Details of the changeover circuit in the event of an inverter failure will be found in Book 2, Sect.5, Chap.1, Group 3A.

10. Reference to fig.2 will show that selecting the port pitch damper control switch to ON will energise relay 478, thus closing relay contacts 478/1, 478/2 and 478/3. However, if the aircraft is below 20,000 ft. the system will be prevented from operating by the auto height switch. At an altitude of 20,000 ft. or above, the internal contacts of the auto height switch will close to energise the internal relay. This will break the supply to relay 479, thus allowing relay contacts 479/1 to close and complete the d.c. circuit for the amplifier. The pitch damper system will now operate until either the ON-OFF switch is selected to OFF, or the aircraft altitude falls below 20,000 ft. Note that relay 479 still controls the mach trim system, as described in Group 7.

AUTOPILOT MK.10

11. The introduction of the E.C.M. equipment into the aircraft has made it necessary to adjust the autopilot parameters previously set by the link-setting cards described in Group 7. To do this new link setting cards have been made available to replace those fitted prior to Mod.613. The changes made are as follows:-

Amplifier:

Link setting card Ref.No.6T/425 is replaced by link setting card Ref.No. 6T/1672.

Approach coupling unit:

The link setting cards for this unit are unchanged.

Bombing coupling unit:

A new link setting card with instructions to set EC -½ on the coupling unit is introduced by Mod.1426. The Ref.No. of this new card is 6T/1815.

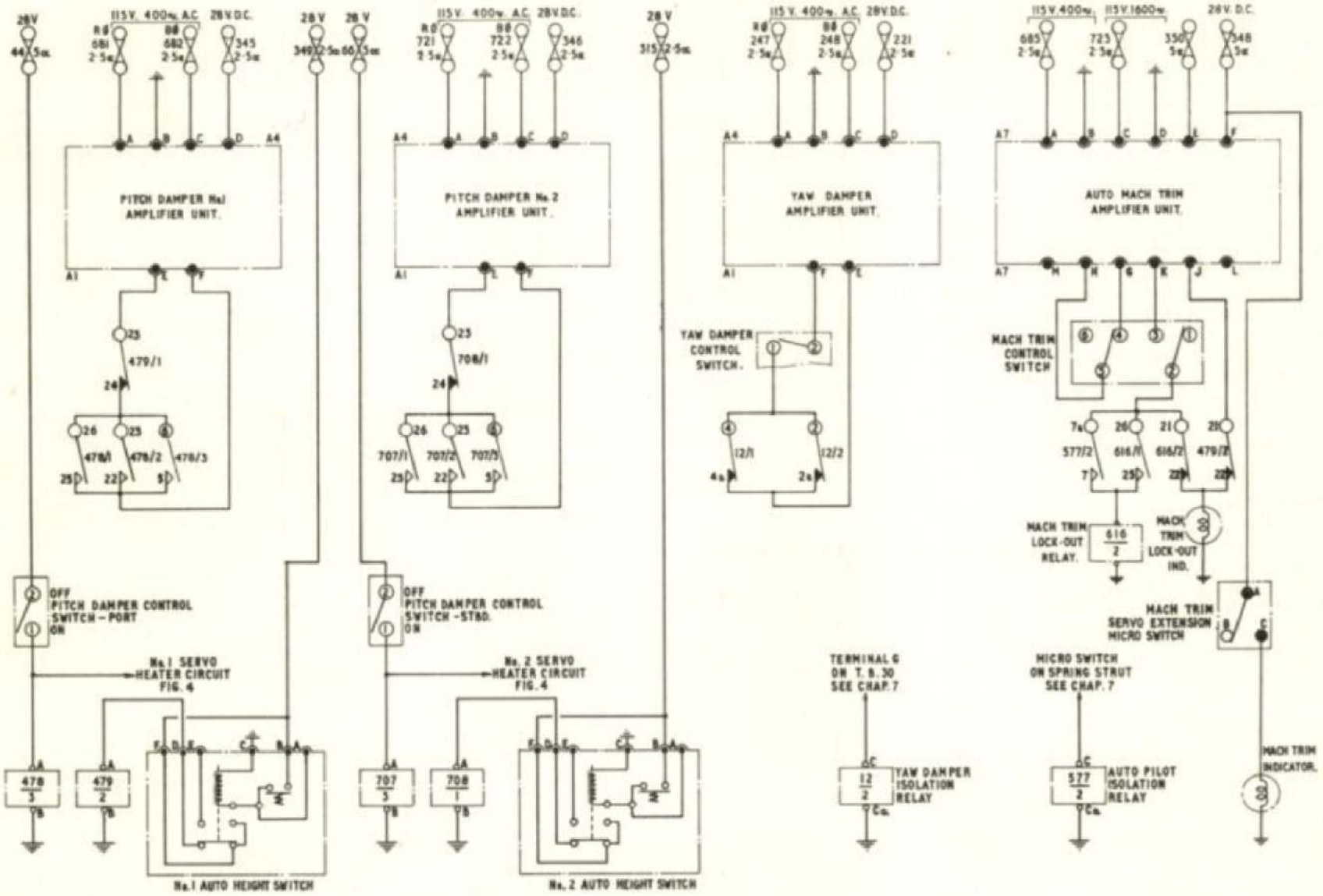

Fig. 2 Autostabilizer Power Supplies

8219 2121 625 7,62 AVR 1354

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SERVICING

General

12. The installation should be checked periodically for security of attachment of the components and associated cable connections. A check should also be made for signs of chafing where cable runs are affixed to the aircraft structure adjacent to moving parts. Detailed servicing instructions for the pitch systems and its components will be found in A.P.1469S, Vol.1, Sect.4.

REMOVAL AND ASSEMBLY

General

13. Access to the components is straightforward and therefore no detail instructions are required. When it is necessary to remove or replace any components, secure all loose connectors to the adjacent aircraft structure to prevent damage.

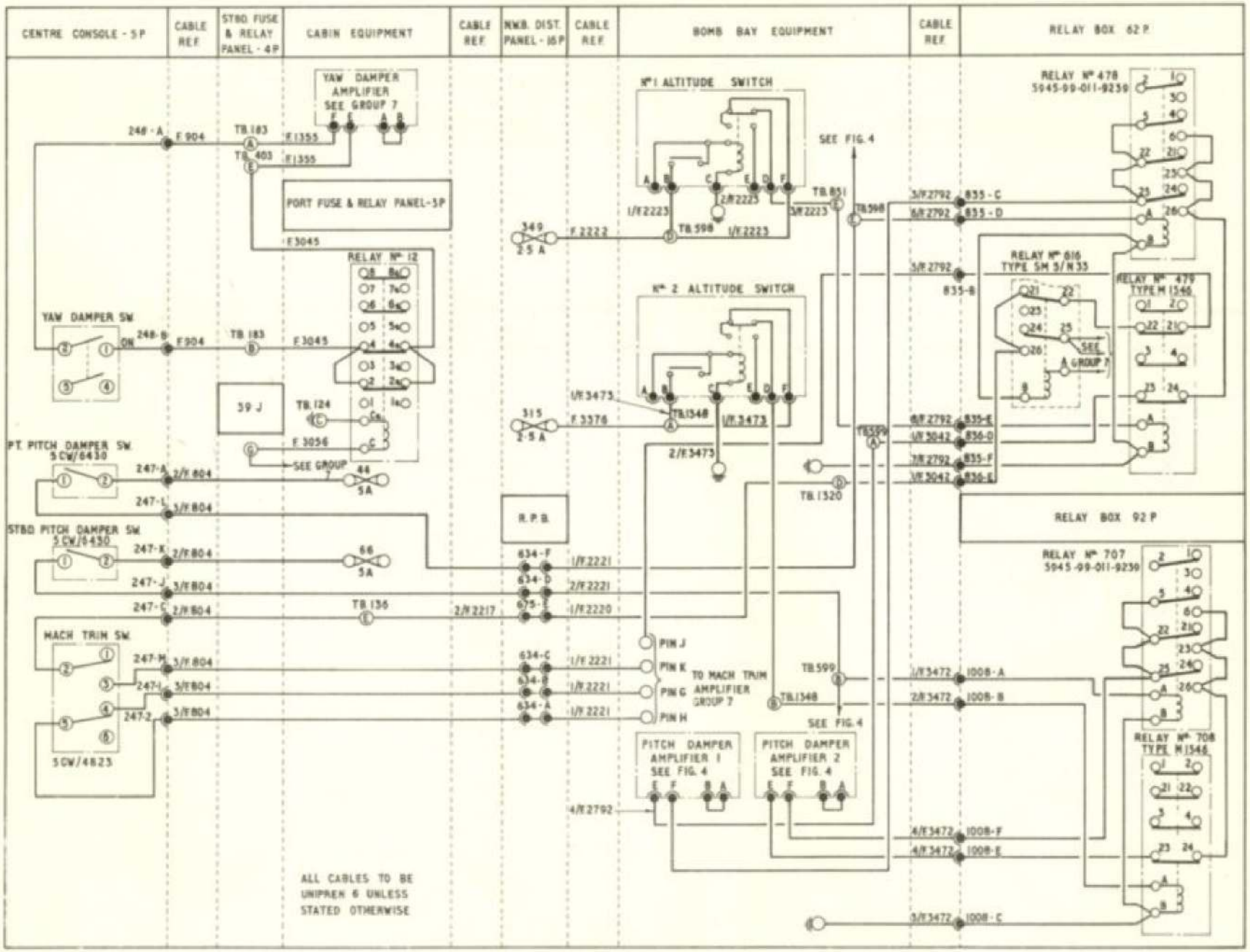

Fig. 3 Auto stabilizer switching

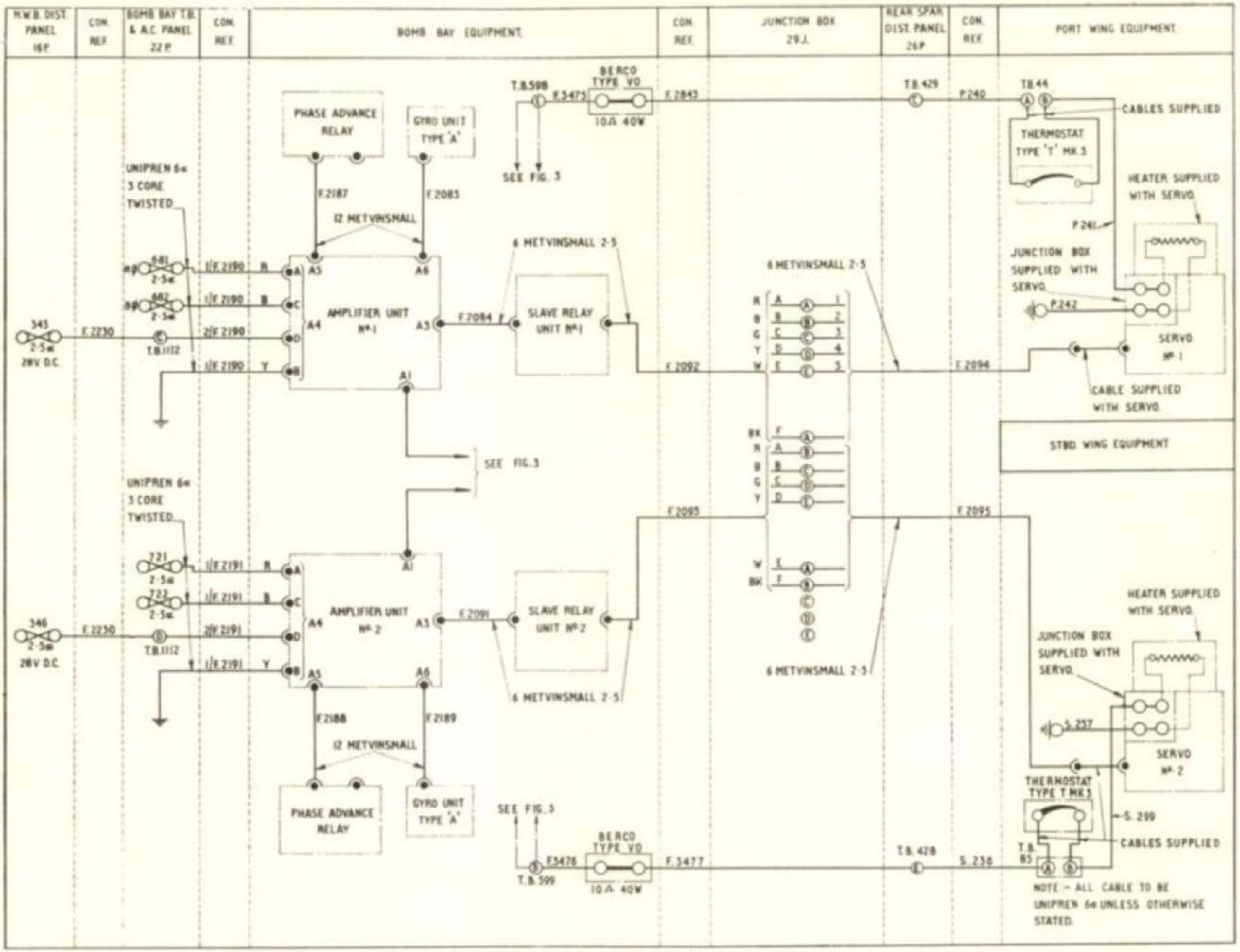

Fig. 4 Pitch stabilizer