

- CHAPTER 13 -

RADIO and ELECTRICAL

13.1 Introduction

Radio and electrical equipment is installed in Chipmunk aircraft to customer's requirements. (See Plate 13.1)

13.2 Battery

The usual electrical system includes a pair of 12 volt batteries connected in series to provide 24 volts with a capacity of 15 or 24 ampere hours. Access to the batteries is provided by a removable cover panel on the decking behind the rear seat. The electrical power supply is controlled by a solenoid switch which is remotely operated by a "Master Switch" on the left hand electrical panel in the front cockpit.

13.3 Generator

In Major 10 installations, an engine driven generator supplies power to the batteries and electrical equipment. The output is controlled by an automatic voltage regulator of the vibrating reed type, and charge rate is indicated on a volt-ammeter on the left hand electrical panel. By pressing the button "Push for Volts" on the volt-ammeter, the system voltage is indicated. On the same panel is a generator circuit breaker which trips to the OFF position when the maximum (17 amperes) generator current is exceeded. This breaker may also be used as a generator on-off switch.

13.4 Starter

The starter is a direct cranking type unit operated by a momentary contact circuit breaker switch on the port electrical panel. A ground starting plug for external 24-volt supply is located on the port side of the fuselage just aft of the engine cowl. The receptacle is designed so that a partial turn to the right is required before the plug can be fully inserted. This ensures that the aircraft battery is disconnected from the starter circuit before contact is made with the external supply.

13.5 Instrument Lights

The instruments are illuminated by a light in an adjustable mount on the port side of the cockpit. The intensity is controlled by a rheostat on the instrument panel. The circuits are protected by a circuit breaker mounted on the right hand electrical panel in the front cockpit.

13.6 Navigation Lights*

The navigation lights comprise standard navigation or "running" lights mounted on the wing tips and tailcone. They are controlled by a circuit breaker switch mounted on the right hand electrical panel.

13.7 Landing Lights

One or two retractable lights may be fitted to the underside of port and/or starboard wings. Three conditions may be selected for each unit: "IN", "OFF", and "OUT". Selecting "OUT" extends the lamp, and just before its fully extended position, the filament lights. "OFF" will turn off the filament but leave the lamp extended. "IN" will turn off the lamp and also retract the unit. Each circuit is protected by a "push to reset" type circuit breaker mounted with the selector switches on the right hand electrical panel.

13.8 Intercommunication

13.8.1 In aircraft employing a 24-volt electrical system, and intercommunication amplifier may be fitted aft of the rear seat. The unit is automatically turned on or off by the battery "Master" switch. The amplifier is protected by a 2 ampere fuse mounted directly on the front face of the unit. Headphones and microphones may be connected to the outlets provided on the right side of each seat diaphragm. Control is provided at a panel on the right side of each cockpit. These control panels function independently of each other. As well as providing headphone volume control, each panel contains a microphone transfer switch for selecting intercommunication amplifier or radio-telephone transmission (if radio is fitted).

A "press-to-talk" switch is provided on the top of each control column as well as at the lower right corner of each instrument panel. The latter are for use by the occupant who is not flying the aircraft. This unit is available for use with either carbon or magnetic microphones as specified.

13.8.2 In aircraft without a battery, inter-cockpit communication may be effected by either a Gosport tube or a self-contained dry battery operated amplifier.

The master unit is mounted on the starboard side of the rear cockpit with a sub-station in the front cockpit on the starboard side. Volume control is possible only at the master unit but affects both outlets. The unit is normally off and becomes active only by pressing one of the "press-to-talk" switches on the control columns or instrument panels. Early series aircraft were equipped with hand-held microphones incorporating "press-to-talk" switches. There is no "ON-OFF" switch fitted, consequently no chance of inadvertently leaving the unit on, causing the batteries to run down. The unit is available for use with either carbon or magnetic microphones as specified.

13.9 Radio

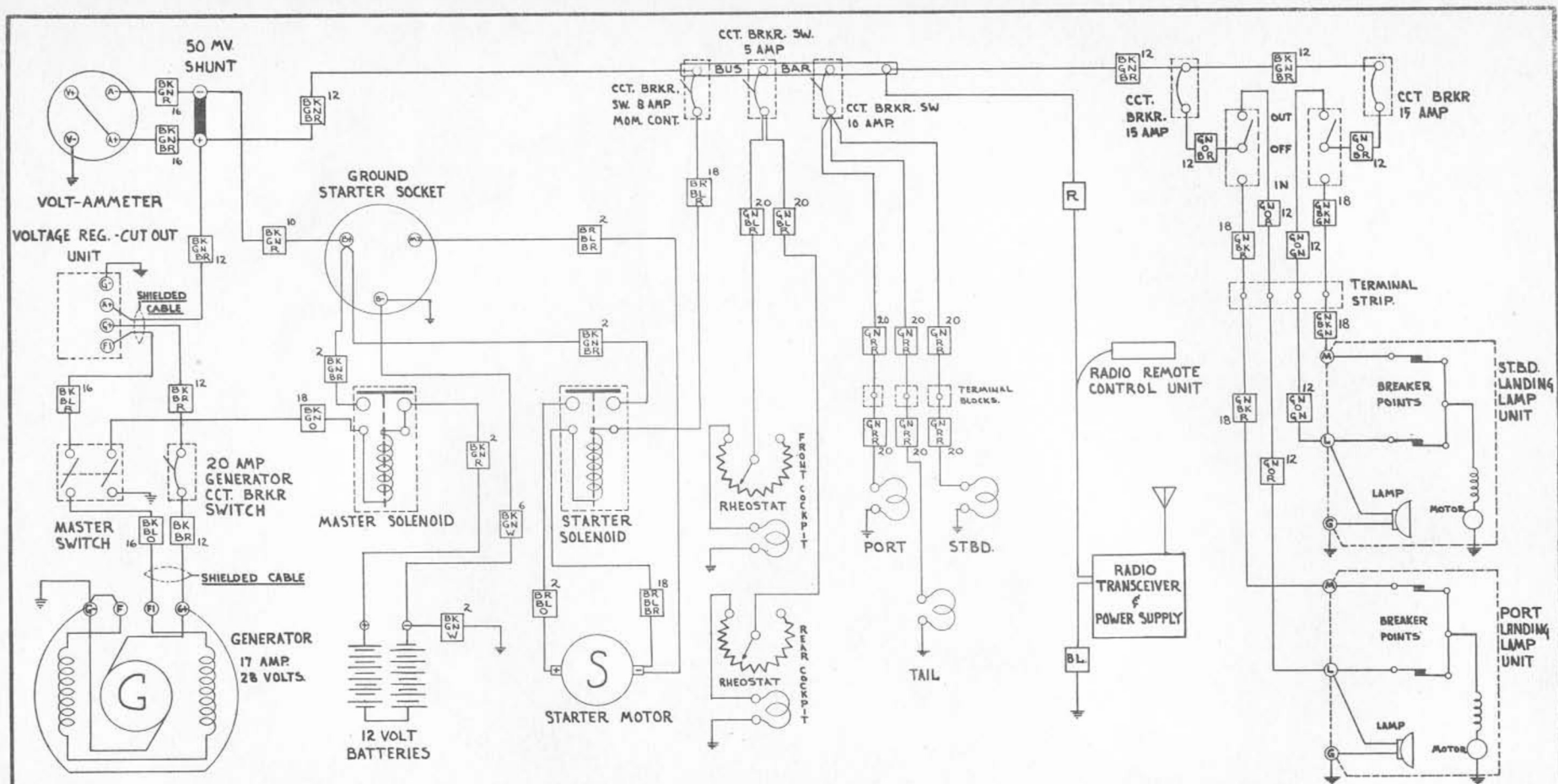
13.9.1 For air-to-air and air-to-ground communication an STR-9 VHF transceiver may be provided. This set has a transmitting power of approximately 3.5 watts. The antenna is a standard 1/4 wave whip type and is mounted on top of the fuselage just forward of the fin. The transmitter-receiver unit is mounted in the rear fuselage and access is provided through an opening in the back of the rear seat, covered by a removable panel, or by a quickly removable rear seat. To operate the unit, an on-off-channel selector switch is mounted in the front cockpit. A selection of 4 pre-determined crystal controlled frequencies may be made between 115 to 145 mc. The set incorporates a squelch circuit that suppresses the received background noise when no incoming signal is being received. Audio output is obtainable from the outlets on the right side of the seat diaphragms. The output volume is pre-set to a desired level and no adjustments in flight are necessary. This unit is designed for use with magnetic microphones.

13.9.2 In some Chipmunk aircraft a light weight (16-1/2 lb.) Murphy VHF transceiver is fitted. The installation including the antenna system is similar to that of the STR-9. The set is controlled by a remote control unit mounted on the right hand side of the front seat diaphragm. Headset volume is automatically regulated with no external controls. With the "ON-OFF" switch on the remote control unit "ON", transmission is accomplished by pressing the switch on the hand-held microphone and speaking. Reception comes back upon release of the microphone switch. The radio circuit is protected by a 2 ampere Slo-Blow fuse on the power supply in the rear fuselage. Transmitting and receiving is possible on any one spot frequency between 116 to 124 mc. Transmitter output power is approximately 1/4 watt. The set is designed for use with carbon microphones.

13.9.3 For operation on HF, a light weight (12.6 lb.) General Electric "Radiofone" may be supplied. It has two receiving bands covering 200 to 420 KC and 550 to 1500 KC. A range filter is incorporated for attenuating the 1020 cycle beam signal, to assist in reading the super-imposed voice signal. Wired for carbon microphone, the transmitter has a power output of 12 watts and is normally crystal controlled on 3105 KC. An alternative frequency may be fitted as required, in the HF band.

PUBLICATIONS

<u>Item</u>	<u>Manufacturer</u>
STR-9 VHF Technical Manual TM/125	Standard Telephones & Cables Ltd., London N.11, England.
The Murphy VHF Aircraft Transmitter- Receiver LA-24 VHF	Murphy Radio Limited, Welwyn, Garden City, Herts., England.
	Cable - Radmurphy.



BR GENERATOR **GN** BATTERY **BL** STARTER **GN** INSTR. L^TS **GN** NAVG. L^TS RADIO **GN** LANDING L^TS

COLOUR CODE

BR - BROWN BL - BLUE
 R - RED P - PURPLE
 O - ORANGE GY - GREY
 Y - YELLOW W - WHITE
 GN - GREEN BK - BLACK

NOTE

THE NUMBER ADJOINING THE COLOUR CODE BLOCK IS THE AWG WIRE SIZE.

ASSOCIATED DRAWINGS

04045 - G.A. NAVIGATION LIGHTS
 04050 - G.A. INSTRUMENT LIGHTS
 04055 - G.A. BATTERY INSTALLATION
 04130 - G.A. BENDIX STARTER INST.
 04180 - G.A. LANDING LIGHTS
 04010 - G.A. ROTAX STARTER INST.
 04275 - G.A. MURPHY RADIO
 04300 - G.A. GENERATOR INST.

SCHEMATIC WIRING DIAGRAM

DHC 1-CHIPMUNK PLATE No 13.1