

Marconi Radar Data Sheet H5

Radar Simulator Cabin Type S5027



Complete, add-on simulation sub-system

Simple interface with static or mobile air
defence systems

Live watch facility during simulation

In order to realize the full capability of an air defence system, all operational personnel must be able to take full advantage of every available facility. This requires comprehensive training programs in system activation, which can be achieved either by setting up costly training missions involving aircraft, weapon systems, and manpower, or by means of a highly realistic simulation facility that exercises the entire operational system. Such a requirement is met by the S5027 simulator cabin which contains a complete simulation sub-system designed for this application.

The cabin and its contents form part of the Marconi S600 series of compatible radar units and, as a transportable system, the S5027 can be rapidly deployed with a convoy or a number of convoys, on a rota basis. Alternatively, the equipment may be supplied as a static version at a permanent or semi-permanent base installation. The design is flexible enough to provide a simple interface with most types of air defence systems.

The S5027 system operates in live or simulated mode or alternatively live plus simulated mode. In either case, the system can readily change to the fully operational role. This method of integration enables a restricted live watch to be maintained during simulation exercises.

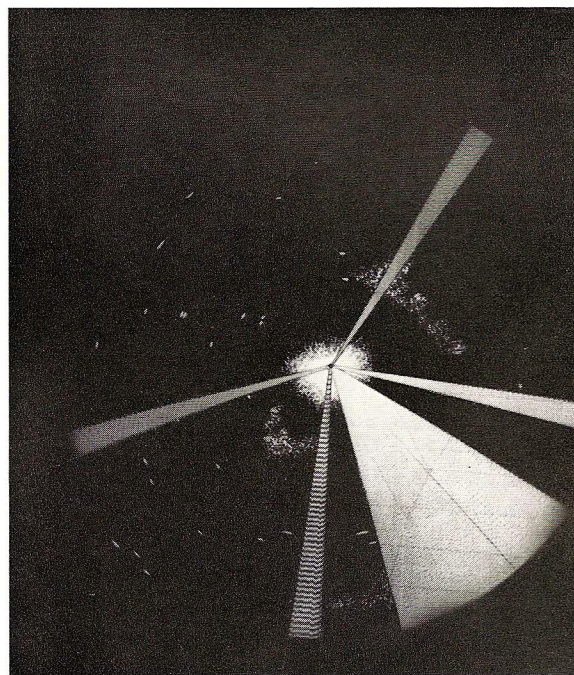
The equipment comprises a digital computer, to which are attached special-purpose peripherals. These generate simulated primary and secondary radar returns, provide a heightfinder interface to the S600 system and communicate with three pilot operator consoles and a simulator supervisor/ allocator console. Radio telephone channels are routed to the pilot operator consoles, and intercom circuits provide simulation of wing operations and operational readiness platform (ORP) lines.

The interior layout and furnishings of the cabin have been carefully designed to give the operators a compact but comfortable working environment, and hence to minimize operator fatigue. The cabin is 2.26m (7ft 5in) high, by 4m (13ft) wide, by 2.26m (7ft 5in) deep. It weighs 2600kg (5730lb) without the running gear and can be transported by air, road, or rail, or lifted by helicopter. Standard detachable running gear for road transport includes built-in jacks for deployment. For full details see Marconi Radar Data Sheet E5.

Operational Facilities

The training environment is provided by presentation of simulated air activity within the local airspace as seen by radar with performance and characteristics visually corresponding to the main equipment. The response of simulated interceptor aircraft is closely matched to their actual performance specification.

The S5027 cabin provides for three pilot operators, each capable of handling up to four tracks simultaneously, and a supervisor/wing operations position capable of starting and allocating tracks for control positions and



Simulated radar display, showing track activity and controllable ancillary effects, and ECM superimposed.

providing executive control of the exercise, e.g. start, stop, freeze.

The tracks available for allocation may be defined in one of two ways. In the first, the supervisor has access to the simulated aircraft on an *ad hoc* basis and simply presents tasks as required. In the second, the exercise is fully specified in terms of the tactical situation which provides the stimulus required for full system response.

System Capacity

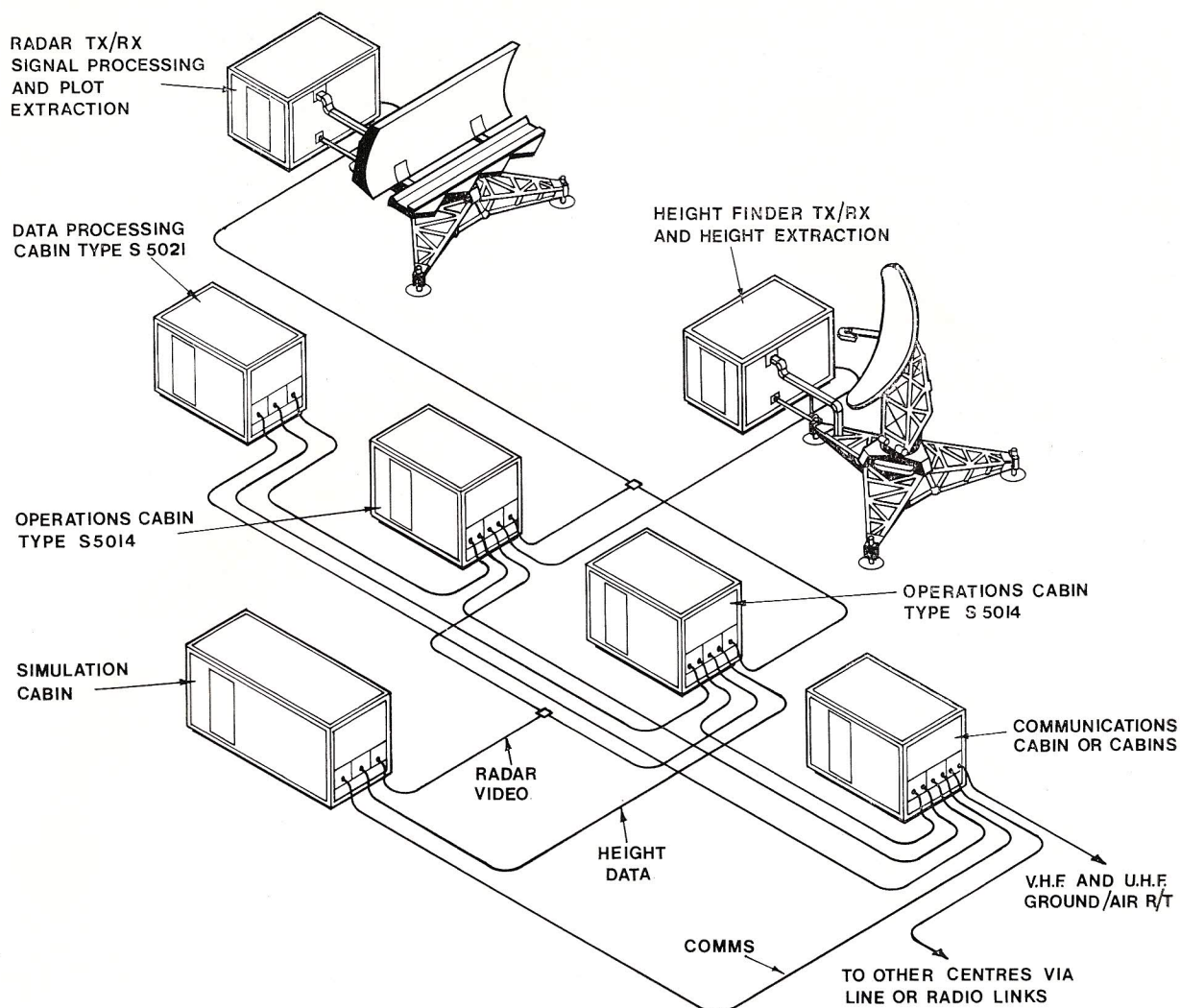
A system capacity of thirty simultaneous active tracks is available and up to four tracks can be allocated to each pilot operator. A further four may be brought under control by the supervisor/ allocator for target evasion or normal pilot operation. The system capacity also includes :

- 1) Fifty reference points such as beacons, dive points or airfield locations
- 2) Three airfields
- 3) Four interceptor types
- 4) Five general aircraft types for background and target tracks
- 5) Three jamming aircraft each capable of producing six types of ECM affecting main and side lobes of the primary radar.

Other general facilities are fully described in Radar Simulator Systems for Control Procedures Training (Marconi Radar Data Sheet N1). The capacity figures apply to a typical configuration and do not individually constitute limitations on the simulator.

System Integration

The S5027 system presents a plug-and-socket interface to the operational system. It is capable of producing both primary and secondary videos and



Typical S600 Tactical Control Station with simulation facility connected.

also of providing an interface to the operational height demand/display panel.

In the simplest case of an S600 system with a single operations cabin, there are two configurations for interfacing the S5027 system. In the first, it is connected to the operations cabin in the same way as for a live radar; each operator then has the ability to select a live or a simulated display. In the second case, the videos from the live radar are fed to the simulator equipment and mixed with the simulated videos. Output may then be selected to live or simulated, or live plus simulated video, and is routed to the operations cabin, where the operator makes the normal selections for a single radar source. In both cases, the simulated height output replaces the operational facility entirely. Height demands from the operator are routed to the computer which performs a search routine and outputs the appropriate height information to the operator.

In a system where there are two or more operations cabins, integration of the simulated radar video may be performed by either method, the simulated heightfinder being connected to one of the cabins. Thus full live working of the second cabin can be maintained.

The S5027 communications system interfaces directly with the operational system, employing available unallocated channels. Noise is injected to simulate ECM on the radio telephone circuits.

Equipment Complement

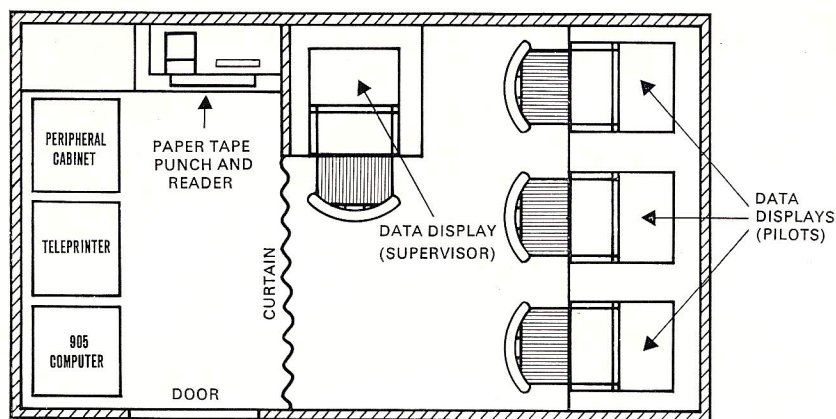
The cabin is divided into two compartments, one for the drive equipment and the other for the pilot operator's consoles.

The computer, its peripherals and the pilot's console equipment are fully described in Marconi Radar Data Sheet N1.

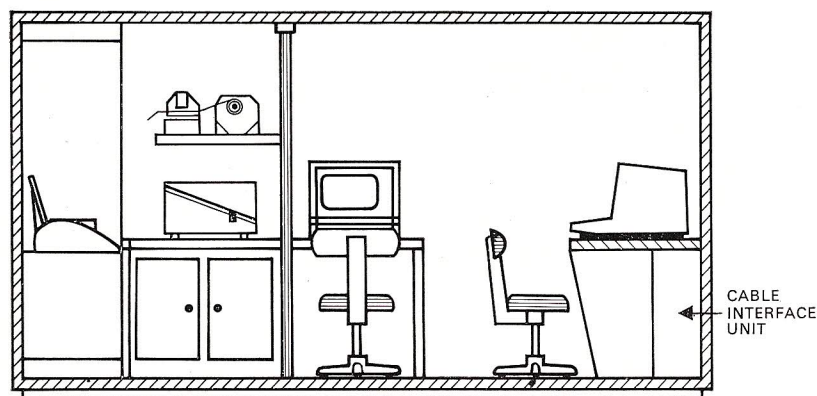
Maintenance Telephones

Ten pairs of lines pass through the cabin with a polypole connector at each end. Ten telephone jacks on a panel are connected to these lines inside the cabin.

All the S600 cabins are fitted with a similar arrangement and may be connected in series to provide a ten-line maintenance telephone circuit. Each cabin has two hand-sets. Each hand-set has its own self-contained power source which causes a remote hand-set to emit a loud tone when a button on the local hand-set is depressed. One of the hand-sets is permanently wired to the line associated with the cabin to act as an alarm on incoming calls, while the other may be jacked into any other line to call other cabins.



S5027 cabin: plan view.



S5027 cabin: sectional elevation.

Mechanical Features

Construction

The cabin, which has a flat roof, is formed by a welded framework construction of square steel tubes, clad internally and externally with aluminium alloy sheet 1.25mm (0.048in) thick, riveted to the frame and forming a screened housing. Spaces between the cladding are filled with polyurethane foam to provide insulation.

A steel lifting eye is secured at each corner of the cabin, the upper set fixing the centre of gravity below the lift attachment points, therefore providing stability in lifting by crane or helicopter. Four adjustable deployment pads are fitted and are used to level the cabin before the running gear is completely removed. Each pad shaft moves in a sleeve, which is positioned and held at the desired height by a locking pin. The cabin can be levelled to within 3.2mm (1/16in) on a ground slope not exceeding 1 in 20.

For the attachment of running gear, two tine tunnels are fixed to the underside of the cabin. To minimize the effects of solar radiation, an overhanging canvas canopy can be fitted to the

cabin roof. The cabin, which is undersealed, is finished in a coating of olive-green drab-matt and conforms to protective requirements specified by Defence Ministries.

Access is made through an r.f. screened door 1.83m (6ft) high by 762mm (2ft 6in) wide in the side of the cabin. A quick release hatch 762mm (2ft 6in) square is situated opposite the door. All services to the cabin are connected externally at a service panel.

Air Conditioning

Two air conditioning units controlled from within the cabin provide air conditioning for the comfort of personnel and for temperature control of equipment.

Mains Power Distribution

Full power control facilities are provided at a master power control panel in the equipment section.

The information given herein is subject to confirmation at the time of ordering.

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