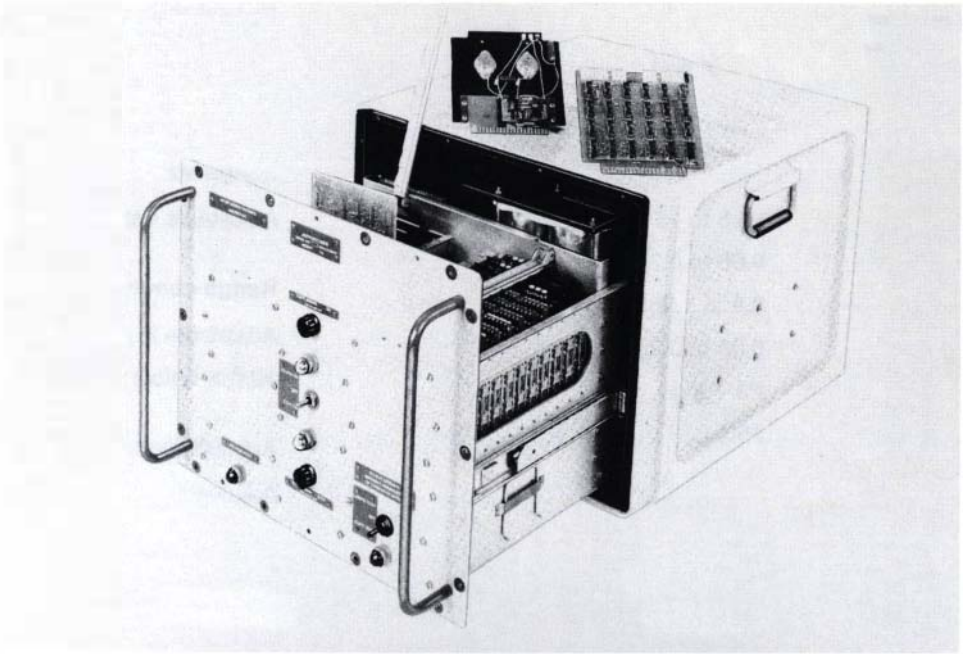
GEC-Marconi Electronic Systems

ESD846

Shipborne IFF Automatic Decoder



- *IFF interrogator control*
- *Decoder and emergency search*
- *Data output to computer*
- *Solid -state throughout*
- *Comprehensive B.I.T.E.*
- *Designed to DEF 133, class N, table N1*

The GEC-Marconi Radar and Defence Systems, Electronic System Division's Shipborne IFF Automatic Decoder ESD846* is designed to meet the Royal Navy requirement for a decoding interface between an IFF interrogator/ transponder and a computer data handling system.

The ESD846 automatic decoder accepts instructions from the computer which specify a particular radar target for interrogation in terms of its range and bearing. On receipt of this information the automatic decoder instructs the interrogator to transmit on a particular mode over a given bearing, the mode being selected from IFF modes 1, 2 or 3/A. Reply signals received by the interrogator are gated in range and azimuth by the automatic decoder and passed to the computer

Facilities are provided for an occasional distress search over the full interrogation range. At present rotation intervals (between 8 and 12 antenna rotations) the output from the interrogator is accepted over a full 360° at maximum range. During this search all replies are examined by the automatic decoder for the presence of IFF Mk 10 (SIF) 4 train emergency replies. When an emergency code is detected an alarm relay is set and the emergency search is continued until manually inhibited.

The ESD846 automatic decoder also accepts bearing information from digitisers on the antenna. Each time an octant boundary is crossed by the antenna, information is passed to the computer, enabling it to prepare data defining the next 'targets'.

The output to the computer data handling system is by way of a Ferranti B standard 24 bit interface with an associated 8 bit command system. This interface employs digital registers to accept data requests from the computer and to hold data prior to acceptance by the computer.

A special feature of the ESD846 automatic decoder is the built-in self-test system operated automatically by the computer or by manual operation of a self-test button on the front of the equipment. On receipt of a computer command a test signal is fed to the automatic decoder giving the range and bearing of a simulated target. This information is compared with the antenna range count and azimuth count until coincidence is reached. At this point a test word is generated and passed through the decoding circuits. If decoding of the test code is not achieved a fault bit is set in the output to the computer to activate an alarm relay. Application of the test button repeats the test cycle except that no information is passed to the computer and satisfactory functioning is signalled by a green lamp.

The equipment is entirely solid-state, making extensive use of integrated circuits to ensure a high degree of reliability and efficiency together with a considerable reduction in weight and size over comparable equipments.

** NATO Designation:- 5895-99-525-0154*
Coder-Decoder Interrogator set.

GEC-Marconi

General

Antenna azimuth input

256 cycles per antenna revolution

Antenna north marker

Square wave with polarity change at 0° and 180°

Interrogator synch pulse

Amplitude	+3.5 to +5V
Rise time	0.05 to 0.2µs
Duration	0.8 to 1.2µs
Fall time	0.05 to 0.2µs
Timing	P3 - 30µs
Impedance	75Ω

Video input

Amplitude	+3.5 to +5V
Rise time	0.02 to 0.1µs
Duration	0.45 ±0.1µs
Fall time	0.05 to 0.15µs
Impedance	75Ω

Other inputs

Distress reset

Interrogator fault

Salvage (continuous interlaced interrogation)

Reset

Mode control outputs

4 lines mode 1, 2, 3 and interlace

Mode selected

Line at zero to +0.5V

Mode deselected

Line at +5V to +7.5V

Computer Interface

Data

24-line highway

Control

8-line highway

Signal characteristics

Ferranti 'B' interface, Issue 2, October 1969

Video Gate Dimension

Range size

Adjustable between 30 and 80µs

Range commencement

Adjustable in 2.9µs steps between 2.9 and 40.6µs before computer indicated range

Azimuth gate width

Adjustable to 5.6°, 8.4° or 11.2°

Azimuth gate position

Centred upon the computer indicated azimuth

Power Supplies

115V, 55 ± 7Hz single phase to DEF STAN 61-5, 80W

Environmental Conditions

Operating temperature

0°C to +55°C

Storage temperature

-40°C to +70°C

Mechanical

DEF 133 N1

Dimensions

354mm height x 442mm width x 555mm depth (14in x 17.5in x 22in)

Weight

28.1kg (62lb)

GEC-Marconi

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