RECOMMENDATION 630*

MAIN CHARACTERISTICS OF TWO FREQUENCY SHIPBORNE INTERROGATOR TRANSPONDERS (SIT)

(Question 28/8)

(1986)

The CCIR,

CONSIDERING

(a) that the use of a secondary radar system would increase the ship's radar range and improve radar discrimination of vessels in the presence of interference;

(b) that the use of a secondary radar system would make it possible to identify individual ships and to obtain navigational and other data from an interrogated vessel;

(c) that the combined use of a secondary radar system and of an automatic radar plotting aid (ARPA) would enhance the efficiency of the latter by increasing the range, the noise immunity of the reply co-ordinate signal and absence of fluctuation in its amplitude;

(d) that in view of CONSIDERINGs *(a)*, *(b)*, and *(c)*, the use of a secondary radar system would help to improve the safety of shipping and the economics and efficiency of shipping operations;

(e) that in the design, preference should be given to a system using two-frequency interrogation consisting of a SIT interrogating signal and a shipborne navigation radar sounding pulse in the 3 cm band;

(f) that the operation mode and the main operating characteristics of the system, as well as the main technical characteristics of the SIT, should be co-ordinated internationally by the users to ensure the compatibility of equipment manufactured in different countries,

UNANIMOUSLY RECOMMENDS

that for the two-frequency SIT system operating in the 10 cm band and the 3 cm band, designed to ensure safe passage of ships and regulation of the movement of ships from a central point:

– the operating modes should conform to Annex I,

– the operating characteristics should conform to Annex II,

– the technical characteristics should conform to Annex III.

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* The Director, CCIR, is requested to bring this Recommendation to the attention of the International Maritime Organization (IMO) and the International Association of Lighthouse Authorities (IALA).

ANNEX I

OPERATING MODES

Interrogation		Response				
Type of working	Address	Content	Capacity	Data input	Reflection	
					Type	Location
All ships	All ships	Polar ship co-ordinates	–	–	Screen blip	PPI radar screen
Selective I	Ship selected by operator	Ship station identity	9 digit number	From continuous storage unit	Figures	Panel display
Selective II	Ship selected by operator	Heading	3 decimal digits	From ship direction and speed sensors or manually	Figures	Panel display
		Speed	2 decimal digits			
		Manoeuvre	1 decimal digit			
Selective III-VI	Ship selected by operator	Determined in development of system	6 digit number	From continuous storage unit or manually	Figures	Panel display

Note. – Blip on PPI radar screen is shown with all types of operation.

ANNEX II

MAIN OPERATING CHARACTERISTICS OF SECONDARY MARINE RADAR SYSTEM

Parameter	Value
Range:	
Minimum (m)	≤ 300
Maximum (raised antenna, height 15 m) (nautical miles)	≥ 10
Resolution:	
In direction (at a radar antenna radiation pattern of width 1°) (degrees)	≤ 3
In distance (m):	
– all ships operation	≤ 200
– selective operation	≤ 500
Distance of response signal from echo signal (m)	≤ 200
Error in determination of ship co-ordinates	Not worse than radar error

ANNEX III

MAIN TECHNICAL CHARACTERISTICS OF SIT

Parameter	Value	
	10-cm band	3-cm band
Antenna:		
Polarization	Vertical	Horizontal
Radiation pattern (degrees):		
In horizontal plane	360°	360°
In vertical plane	40°-60°	40°-60°
Transmitter:		
Carrier frequency (MHz)	2940 ± 2	
Impulsive power (W)	100-200	–
Length of pulse (ns)	100 ± 20	
Receiver:		
Sensitivity (dBW)	Better than –115	Better than –72
Frequency band (MHz)	2930-2950	9320-9500
Bit rate (Mbit/s):		
Of interrogating signal	2	
Of response signal	3.3	
Interrogating signal lead time relative to associated radar sounding pulse (μs)	14 ± 0.2	