

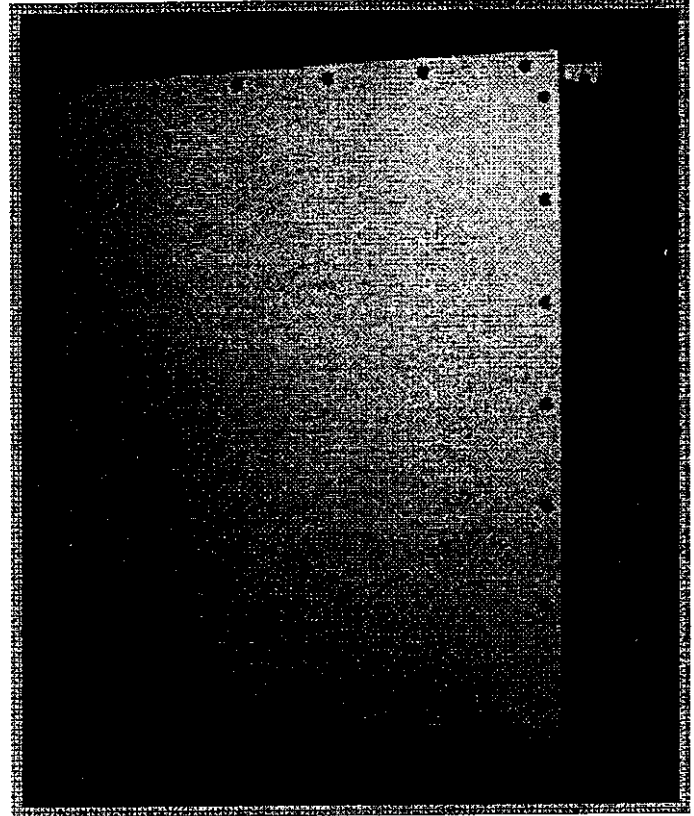


GEM Elettronica

MODEL RT 02-25

RADAR TRANSCEIVER X-BAND 25 KW

The GEM Elettronica RT 02-25 radar transceiver is designed primarily for land-based installations in vessel traffic management and coastal surveillance applications, where extremely high bearing and range discrimination are requisite. In terms of coupling to antennas and display-processing systems, the RT 02-25 is versatile and stand-alone. It connects to practically any modern X-band antenna system, accepting a wide range of rotation speeds (from 10 to 26 r.p.m.), just as it interfaces with nearly any radar data processor and display system, using RS 422 communications links for receiving and responding to operator commands.



The RT 02-25 transceiver is housed in a single, watertight cabinet, itself made of sturdy, aluminum-magnesium alloy plating welded together at the edges. One of the RT 02-25's main attributes is that two of them can be installed in side-by-side fashion and operated as a "dual-redundant" transceiver system, meaning that if one becomes inoperable because of failure, the other is readily available. The likelihood of a radar site's being without an operable transceiver is thus reduced dramatically. The dual-redundant configuration does require that the two RT 02-25 transceivers be connected through a GEM Elettronica RF waveguide switch with incorporated dummy load.

In the unlikely event that failure occurs, troubleshooting and repair is made simple and rapid thanks to built-in test equipment (BITE) embedded in the RT 02-25. The BITE consists of a fault detection program, which runs continuously and informs the operator of abnormalities as soon as they happen. When such a report is received, the operator executes a fault isolation program that reveals which of the system modules is causing the abnormality. Restoring the transceiver to normal operation is therefore a simple matter of replacing the faulty module that has been singled out by the fault isolation program.

(See reverse for technical data.)

BASIC PERFORMANCE DATA			
Magnetron peak power	25 kilowatts (nominal)		
Transmission frequency	9375 MHz $\pm$ 30 MHz (X Band)		
Modulator type	Fully solid state		
Receiver type	Solid state logarithmic		
Receiver dynamic range	$\geq$ 90 dB		
Pulse	Pulse Length	PRF Range	I.F. Bandwidth
Short	80 μ S	4000 - 4200 Hz	20 MHz
Medium	200 μ S	3000 - 3200 Hz	8 MHz
Long	600 μ S	2000 - 2100 Hz	4 MHz
Very long	1000 μ S	1000 - 1100 Hz	4 MHz
Tolerances	$\pm$ 20 %	N/A	$\pm$ 20 %
Waveguide components employed	Circulator, TR limiter and solid-state front-end module. The front end module incorporates a radio frequency amplifier, a double balanced mixer and a gun diode oscillator.		
Intermediate frequency (I.F.)	60 MHz		
Overall noise figure:	$\leq$ 3.5 dB (nominal)		

ANTENNA COMPATIBILITY	
Antenna speed	Acceptable rotation speeds of the antenna are from 10 to 26 r.p.m., inclusive.
Azimuth inputs	For each revolution of the antenna, the transceiver requires one azimuth reset pulse (ARP) and 4096 azimuth change pulses (ACPs), on RS 422 differential communications link.
Antenna motor power	Provided in the transceiver by means of a relay. Both single and three phase antenna motors can be used.
Motor thermal protection	Shuts down antenna rotation should the antenna motor jam or otherwise overheat. Provided by means of a current loop monitoring dry contacts.
External safety switch	An RF transmission disabling switch, located on the antenna assembly, for ensuring safety to a person situated nearby the antenna. Provided by means of a current loop monitoring dry contacts.

UNIQUE FEATURES	
PRF staggering	A selectable PRF stagger facility can be activated in order to reduce interference with other radars operating nearby on the same frequency band. The staggering function is pseudorandom, employing a 6-8 % variance about the nominal PRF in eight discrete steps.
Tuning	Both manual tuning and automatic frequency control (AFC) tuning.
Sector blanking	A single azimuth sector, from 10 to 350 degrees, in 1 degree increments, can be excluded from transmission. This is intended mainly for eliminating unnecessary radar returns from shore areas and land structures.
Radar image alignment	North alignment of the radar image is carried out over the RS 422 communications link. Acceptable azimuth corrections range from 0 to 359.9 degrees in 0.1 degree increments.
Built-in test equipment	A continuously running fault detection program detects and reports failures over an RS 422 communications link. A separate fault isolation program, run on operator request via the same RS 422 link, reveals the source of the failure at the lowest replaceable component, facilitating the quick substitution of the faulty component in the field.

ENVIRONMENTAL PERFORMANCE	
Operating temperature range	From -25°C to +55°C
Note: Inclusion of optional heating unit lowers range to -40°C.	
Relative humidity	Up to 95 % at +40°C
Vibrations	In accordance with IEC-945
Vibration/shock	1 G from 0 to 50 Hz

ELECTRICAL POWER	
Required supply	Both 110 VAC @ 60 Hz and 220 VAC @ 50 Hz single-phase. Either one of the two voltages can be selected from inside the cabinet.
Absorption	200 Watts (nominal)

DIMENSIONS AND WEIGHT	
Transceiver (outside measurements of cabinet excluding vertical mounting beams)	Height 860 mm. Width 672 mm. Depth 314 mm. Weight 40 kilograms
RF waveguide switch (outside measurements of cabinet excluding vertical mounting beams)	Height 400 mm. Width 590 mm. Depth 350 mm. Weight 36 kilograms



GEM ELETTRONICA S.R.L.
Via Amerigo Vespucci, 9
63039 San Benedetto del Tronto (AP)
ITALY
Tel. +39 735 59051 - Fax +39 735 590540

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ISO 9001 Certification Number 120

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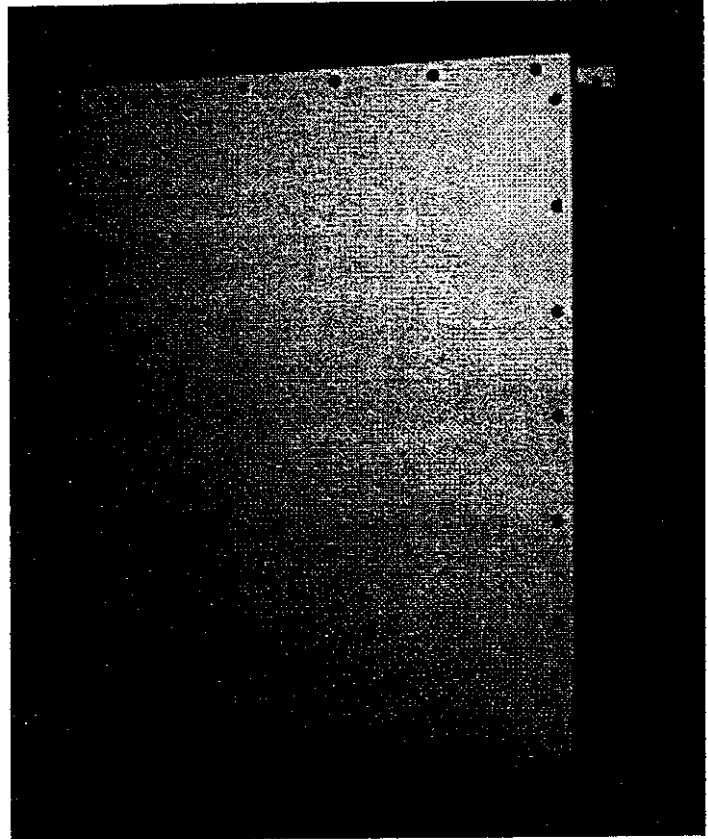


GEM Elettronica

MODEL RT 02-50

RADAR TRANSCEIVER X-BAND 50 KW

The GEM Elettronica RT 02-50 radar transceiver is designed primarily for land-based installations in vessel traffic management and coastal surveillance applications, where extremely high bearing and range discrimination are requisite. In terms of coupling to antennas and display-processing systems, the RT 02-50 is versatile and stand-alone. It connects to practically any modern X-band antenna system, accepting a wide range of rotation speeds (from 10 to 26 r.p.m.), just as it interfaces with nearly any radar data processor and display system, using RS 422 communications links for receiving and responding to operator commands.



The RT 02-50 transceiver is housed in a single, watertight cabinet, itself made of sturdy, aluminum-magnesium alloy plating welded together at the edges. One of the RT 02-50's main attributes is that two of them can be installed in side-by-side fashion and operated as a "dual-redundant" transceiver system, meaning that if one becomes inoperable because of failure, the other is readily available. The likelihood of a radar site's being without an operable transceiver is thus reduced dramatically. The dual-redundant configuration does require that the two RT 02-50 transceivers be connected with a GEM Elettronica RF waveguide switch with incorporated dummy load.

In the unlikely event that failure occurs, troubleshooting and repair is made simple and rapid thanks to built-in test equipment (BITE) embedded in the RT 02-50. The BITE consists of a fault detection program, which runs continuously and informs the operator of abnormalities as soon as they happen. When such a report is received, the operator executes a fault isolation program that reveals which of the system modules is causing the abnormality. Restoring the transceiver to normal operation is therefore a simple matter of replacing the faulty module that has been singled out by the fault isolation program.

(See reverse for technical data.)

Radar Transceiver RT 02-50

BASIC PERFORMANCE DATA

Magnetron peak power	50 kilowatts (nominal)		
Transmission frequency	9375 MHz $\pm$ 30 MHz (X Band)		
Modulator type	Fully solid state		
Receiver type	Solid state logarithmic		
Receiver dynamic range	≥ 90 dB		
<i>Pulse</i>	<i>Pulse Length</i>	<i>PRF Range</i>	<i>I.F. Bandwidth</i>
Short	50 μ S	3600 - 3800 Hz	20 MHz
Medium	100 μ S	1800 - 1900 Hz	20 MHz
Long	250 μ S	1600 - 1700 Hz	8 MHz
Tolerances	± 20 %	N/A	± 20 %
Waveguide components employed	Circulator, TR limiter and solid-state front-end module. The front end module incorporates a radio frequency amplifier, a double balanced mixer and a gun diode oscillator.		
Intermediate frequency (I.F.)	60 MHz		
Overall noise figure:	≤ 3.5 dB (nominal)		

ANTENNA COMPATIBILITY

Antenna speed	Acceptable rotation speeds of the antenna are from 10 to 26 r.p.m., inclusive.
Azimuth inputs	For each revolution of the antenna, the transceiver requires one azimuth reset pulse (ARP) and 4096 azimuth change pulses (ACPs), on RS 422 differential communications link.
Antenna motor power	Provided in the transceiver by means of a relay. Both single and three phase antenna motors can be used.
Motor thermal protection	Shuts down antenna rotation should the antenna motor jam or otherwise overheat. Provided by means of a current loop monitoring dry contacts.
External safety switch	An RF transmission disabling switch, located on the antenna assembly, for ensuring safety to a person situated nearby the antenna. Provided by means of a current loop monitoring dry contacts.

UNIQUE FEATURES

PRF staggering	A selectable PRF stagger facility can be activated in order to reduce interference with other radars operating nearby on the same frequency band. The staggering function is pseudorandom, employing a 6-8 % variance about the nominal PRF in eight discrete steps.
Tuning	Both manual tuning and automatic frequency control (AFC) tuning.
Sector blanking	A single azimuth sector, from 10 to 350 degrees, in 1 degree increments, can be excluded from transmission. This is intended mainly for eliminating unnecessary radar returns from shore areas and land structures.
Radar image alignment	North alignment of the radar image is carried out over the RS 422 communications link. Acceptable azimuth corrections range from 0 to 359.9 degrees in 0.1 degree increments.
Built-in test equipment	A continuously running fault detection program detects and reports failures over an RS 422 communications link. A separate fault isolation program, run on operator request via the same RS 422 link, reveals the source of the failure at the lowest replaceable component, facilitating the quick substitution of the faulty component in the field.

ENVIRONMENTAL PERFORMANCE

Operating temperature range	From -25°C to +55°C
Note: Inclusion of optional heating unit lowers range to -40°C.	
Relative humidity	Up to 95 % at +40°C
Vibrations	In accordance with IEC-945
Vibration/shock	1 G from 0 to 50 Hz

ELECTRICAL POWER

Required supply	Both 110 VAC @ 60 Hz and 220 VAC @ 50 Hz single-phase. Either one of the two voltages can be selected from inside the cabinet.
Absorption	200 Watts (nominal)

DIMENSIONS AND WEIGHT

Transceiver (outside measurements of cabinet excluding vertical mounting beams)	Height	860 mm.
	Width	672 mm.
	Depth	314 mm.
	Weight	40 kilograms
RF waveguide switch (outside measurements of cabinet excluding vertical mounting beams)	Height	400 mm.
	Width	590 mm.
	Depth	350 mm.
	Weight	36 kilograms



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