



GOALKEEPER

General

Goalkeeper is an autonomous and completely automatic weapon system for short-range defence of ships against highly manoeuvrable missiles, aircraft and fast manoeuvring surface vessels. The system automatically performs the entire process from surveillance and detection to destruction, including selection of the next priority target. The crucial importance of a last-ditch defence system has been proven on numerous occasions. To provide for this need, Thales Naval Nederland developed Goalkeeper, an extremely effective system, which has been adapted by several navies. Goalkeeper incorporates the General Dynamics (AS) 30-mm, 7-barrel GAU-8/A Gatling gun with special missile-piercing discarding-sabot (MPDS) ammunition, operating on the kinetic energy principle. The combination of MPDS ammunition and a firing rate of 4200 rds/min gives the system the power necessary to destroy missile warheads. The magazine capacity is sufficient to permit successful engagement of several targets under worst case conditions before reloading. Loading of the ammunition is carried out below deck in a protected environment, whilst the Goalkeeper surveillance function remains operational. As an optional automatic loading facility, a Goalkeeper Magazine Loading System can be added to the Goalkeeper system, which significantly reduces the loading time.

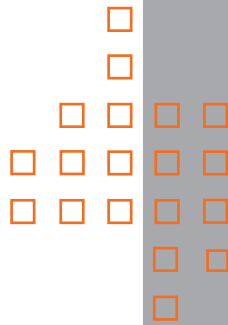
GOALKEEPER provides excellent performance against surface targets. Search and track radars, weapon control and integration of the total system are the responsibility of Thales Naval Nederland. A high detection probability for small targets is ensured in all weather conditions by the use of a high-power, I-band search radar.

A driven Travelling Wave Tube (TWT) transmitter permits great frequency flexibility, which augments anti-clutter and ECCM performance. Pin-point target tracking is achieved by the dual frequency I/K-band track radar.

The system features automatic target indication and track initiation. Threat priority is determined automatically and is immediately followed by automatic direction of the track antenna to the "priority one" target. Continuous search with track-while-scan ensures rapid engagement of the next priority target in multi-target scenarios. Goalkeeper's capabilities have been proven many times during sea-going trials. The U.S. trials held in 1990, during which 3 types of live missiles were destroyed by Goalkeeper, conclusively confirmed the capabilities of this proven CIWS.

Main characteristics

- Assured target detection
- Short reaction time
- Image-free target tracking
- Advanced ECCM and anti-clutter features
- Automatic hitting point correction
- Gun with low dispersion
- High reliability
- Destructive ammunition (MPDS and EMPDS)
- Optimized against surface targets.



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Close-in weapon system

Functional Aspects

I- and K-band frequencies are used for target tracking with continuous automatic comparison of the signal-to-noise ratios. The K-band pencil beam provides virtually reflection-free tracking right down to wavetop level, enabling fast and accurate fire control prediction.

Automatic hitting point correction by closed-loop spotting ensures the most accurate firing possible.

Detection probability is enhanced by the application of special processing techniques, such as pulse compression and FFT (Fast Fourier Transformation). A TV camera (or IR as an option) enables automatic optronic tracking.

Performance Data

Anti-clutter features

- High frequency stability (pulse-to-pulse coherent)
- Quadrature detection combined with FFT for search and track signal processing
- High flexibility in frequency and PRF
- Frequency diversity
- Application of pulse compression (small resolution cell for search).

ECCM features

- Pulse compression
- High output power (for burn-through) combined with FFT for search and track
- Frequency diversity
- Monopulse tracking in I- and K-band.

Technical Data

Gun mount

- Gun type : GAU-8/A
- Calibre : 30 mm
- Rate of fire : 4200 rds/min
- Number of barrels : 7
- Ammunition capacity : 1190 rounds
- Feed system : linkless
- Ammunition type : TP, HEI, MPDS, FMPDS
- Mount control:
 - training : unlimited
 - elevation : -20 to +80°

Radar system

- Search antenna
 - Frequency : I-band
 - Type : linear array
 - Beamwidth : horizontal : 1.7° vertical : 60°
 - Stabilization : biaxial
 - Rotation speed : 60 rpm
 - SLS antenna : integrated with search antenna

- Track antenna
 - Frequency : I-band and K-band
 - Type : Cassegrain
 - TV camera : compatible with CCIR type B

Dimensions and Weight (max. values)

| | Width (mm) | Height (mm) | Depth (mm) | Weight (kg) |
|---------------------------|------------|-------------|------------|--------------------|
| Gun mount above deck | Ø 5262 | 3412 | - | 6800 ³⁾ |
| Gun mount below deck | Ø 2184 | 2800 | - | |
| Receiver and FCU cabinet | 830 | 1694 | 782 | 310 |
| Transmitter cabinet | 1211 | 1890 | 810 | 1120 |
| Waveguide drier | 670 | 687 | 650 | 83 |
| Mount control electronics | 1905 | 1829 | 813 | 1230 |
| Weapon control console | 760 | 1798 | 1266 | 320 |
| System interface cabinet | 1420 | 1652 | 782 | 610 |
| Deck junction box | 864 | 203 | 318 | 64 |
| Circulator unit | 410 | 477 | 241 | 26 |

³⁾ Including ammunition.

Power Requirements

- Gun mount
 - 440 V 60 Hz 3 ph 90 kVA peak during 0.35 s ¹⁾
 - 440 V 60 Hz 3 ph 10 kVA (anti-ice)
- Below-deck equipment
 - 440 V 60 Hz 3 ph 36 kVA
 - 115 V 400 Hz 3 ph 5.5 kVA ²⁾
 - 115 V 60 Hz 3 ph 2.5 kVA
 - 115 V 60 Hz 1 ph 0.1 kVA
 - 115 V 60 Hz 1 ph 2.5 kVA (anticondensation)
 - 24 V DC 12 VA (no-break)

¹⁾ Average 8.7 kVA, standby 5.4 kVA ²⁾ Rush-in 180 A during 30 ms

Environmental Conditions

The design and construction of the equipment are based on current, international military standards for shipborne equipment.

System Overview

