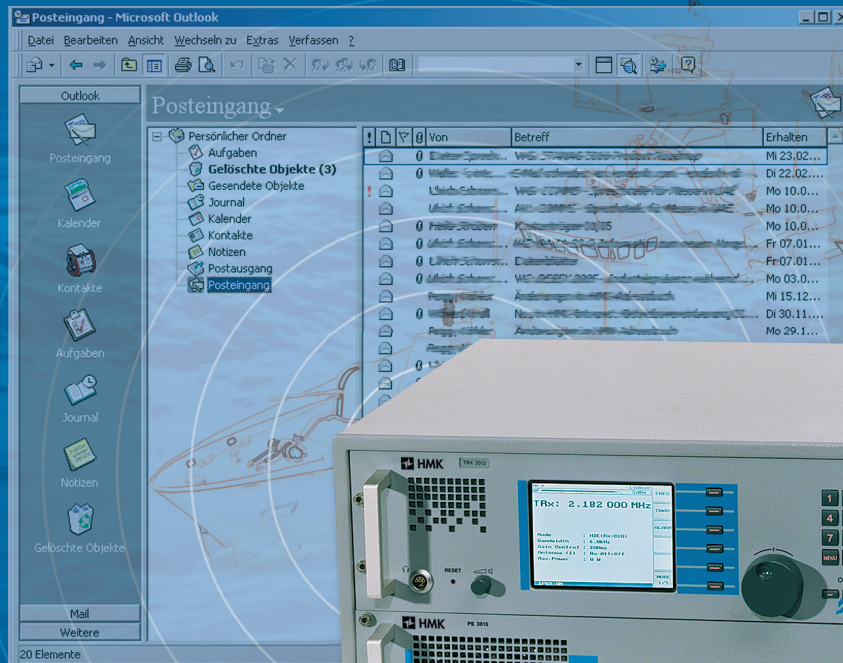


# HF E-MAIL SYSTEM SEICAM 2020E



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## Features

- **Interoperability:**  
SEICAM 2020E is an optional part of the Radio Family 3000 series.
- **Familiar Interface:**  
Send and receive mail e.g. with MS Outlook, Netscape Navigator or Thunderbird. The supplied COTS mail server works with any SMTP/POP3 compatible mail client.
- **Encryption:**  
SEICAM 2020E is compatible with popular e-mail encryption plug-ins like PGP and Verisign.
- **Proven Standards:**
  - Fully compliant with MIL-STD-188-110B serial tone/QAM modem specification.
  - designed according to STANAG 5066 profile for HF data communication.
- **Upgradeable:**  
SEICAM 2020E software is upgradeable making it a safe investment.
- **Radio Sharing:**  
One SEICAM 2020E node may be shared on a LAN and used by multiple users.
- **Frequency Sharing:**  
“Listen-before-transmit” and collision resolution support single Frequency operation of multiple users.
- **Maximum throughput:**  
ARQ, compression on-the-fly, and dynamic negotiation of modem data rate ensure error-free data at the maximum possible data rate.
- **Fully supports Hagenuk HF-equipment and software.**
- **Supported operating systems:**  
Windows 2000, XP

## Overview

The Hagenuk HF e-mail system SEICAM 2020E is more than a standalone system. Equipped with the HF modem MDM 3000 E, SEICAM 2020E can use existing HF radio equipment and a laptop computer to deliver messages fast and error-free. To assure maximum performance SEICAM 2020E uses proven military standard waveforms. The system is designed for applications where an individual or group requires Internet e-mail, but has no means to establish a conventional Internet connection. It is designed to operate in one of two configurations, as either a base station or as a remote station. The base station has Internet connectivity and the out station is at a remote location without Internet connectivity.

The base station is responsible for collecting mail from the Internet and/or other private networks relaying it to and from the remote station. Typically, the base station and remote station use identical hardware. The only difference is in the configuration of the SEICAM 2020E software application, and the local mail servers that are providing the TCP/IP interface. Each computer runs the Hagenuk SEICAM 2020E application and a COTS mail server. The mail server collects, sends and receives mail from both the Internet/WAN and client applications (i.e. MS Outlook or Netscape Navigator).

### The SEICAM 2020E application

- extracts the mail from the mail server, sends it over the air, and hands it to the mail server at the other end. The system can be configured to forward mail from either individual accounts or entire domains.
- displays an assortment of information relating to each message transfer.
- automatically compresses the message being transferred on-the-fly, and adaptively controls the modem data rate so that maximum throughput is obtained.
- provided FAX function by an add-in option on the COTS mail server. Data transfers are fully automatic, and once the system is up and running, no operator intervention is required.

### There are two distinct link modes available:

1. In a point-to-point link Automatic repeat request (ARQ) retransmits any information corrupted by the channel so that error-free communication is assured.
2. Broadcast allows reliable HF data communication to multiple stations at any time by using Forward Error Correction (FEC) protocols. The SEICAM 2020E data transfer protocol arbitrates the channel so that multiple users may transfer data efficiently, even when only a single frequency is available. Each station uses a “listen-before transmit” strategy to prevent traffic collisions. Every station is uniquely addressable for message routing.

The Hagenuk MDM 3000 E provides the modem capabilities of the system. It is fully compliant with MIL-STD-188-110A and B serial-tone/QAM modem specification, NATO STANAG 4285, 4415 and FSK. Only established military standard waveforms are employed. The modem is available as an external 19” unit as well as a built-in module for the HF radio series 3000.

Auxiliary equipment is available for upgrading existing land based HF ground stations, e.g. SEICAM 1001 C for interfacing SEICAM 2020E to existing audio lines.

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## SEICAM 2020E

### Mail, release and routing service

E-mail service in military environment requires additional functions as normally provided by known Internet standards. There is a need that e-mails being created must be approved by a releasing authority before sending it to the destined participant. Specific routing functions are also necessary, which refer to the characteristics of a radio network different from those of the terrestrial system. A typical SEICAM 2020E centre consists of a mail, release and routing service. Incoming and outgoing mails will be exchanged by a COTS mail service. Mails via HF links will be submitted to the releasing position for approval before forwarding it. This refers to messages exchanged between users of the terrestrial and the HF network.

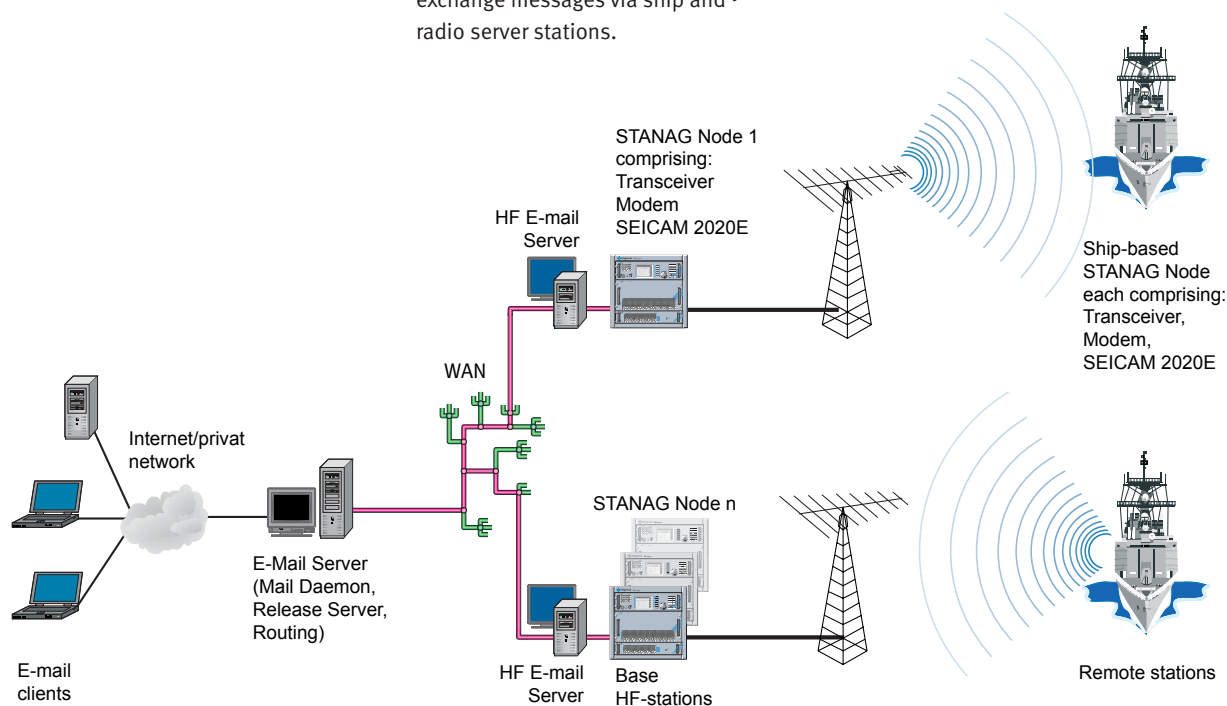
With this a SEICAM 2020E set becomes a military gateway between a ground subnet and network consisting of mobile HF users. E.g. an e-mail created at any position in the terrestrial network will be routed to the appropriate radio base station to send this mail to the area where the mobile user can be reached.

Vice versa any mail received at ground stations will be routed to the SEICAM 2020E position in order to gateway it to the recipient.

SEICAM 2020E mail, release and routing service can be configured to be used in main nodes of terrestrial HF networks. A complementary configuration is available for ship platforms, e.g. corvettes, frigates, carriers or other leading ships. A local area network includes multiple message handling and e-mail clients using a SEICAM 2020E node as a mail, release and routing server to exchange messages via ship and 'radio server stations.

## HF e-mail base station

A fixed HF e-mail shore station is the access point between the land based data network and mobile stations. HF e-mails originated either at the land based terminals or ship station will be routed through this node. Normally a typical military network will consist of multiple base stations in order to cover all areas of the task forces. Each of the base stations is tied to the central station via the ground network which collects e-mails from various receiving stations or routes e-mails to the destined transmitting ground station. A ground station may be fitted as a broadcast facility to send or receive messages in broadcast mode. In a split-site or transmit/receive configuration STANAG 5066 protocols supports the high reliable mode of ARQ.



Typical layout of the SEICAM 2020E HF E-Mail system

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