TerMSG4 Ships

message handling terminal

SHAPING THE FUTURE
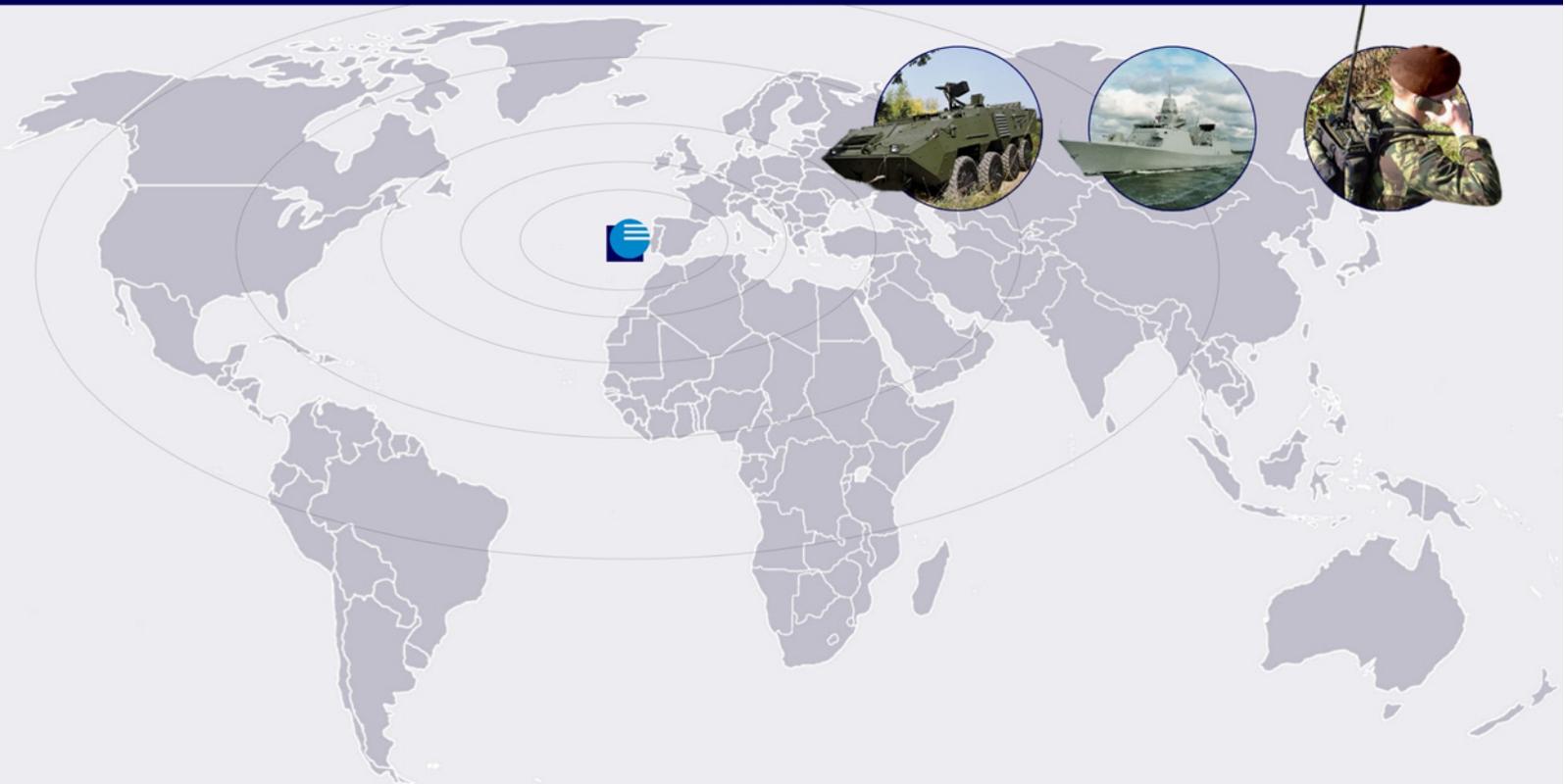
... in defence communications

EID

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1 SYSTEM DESCRIPTION

1.1 General

TerMSG4 Ships is an automatic tool for messages processing, featuring a comprehensive set of facilities aimed to process and manage the messages of the ship to and from external stations.

A graphical, enhanced man-machine interface has been developed, providing a straightforward and intuitive operation, which is of utmost relevance under stressful conditions, as frequently found during missions at sea.

With a substantial degree of automation, the system reduces the operator's workload, thus minimising the likelihood of occurrence of operational and administrative mistakes. The reduction of the ship's complement, as far as skilled communication operators are concerned, is also a significant benefit.

The TerMSG4 Ships consists of one or more messages terminals in a local area network providing the operators with facilities for the tasks of edit, transmit, receive, archive and consult of messages.

The interface to the ship's radioteletype and data channels, whose number also depends on the specific type of ship, is provided either by the computer platform or through front-end processors.

A graphical, enhanced man-machine interface has been developed, providing a straightforward and intuitive operation, which is of utmost relevance under stressful conditions, as frequently found during missions at sea. A user-friendly interface also leads to significant savings, as far as the training effort is concerned.

The messages are stored in a database providing facilities to access, edit, transmit, receive and process any message whenever necessary. Several communication circuits are handled (either plain or ciphered).

For each communication circuit the system operator may define the start and the end of message sequences.

TerMSG4 Ships is therefore a flexible system, with indigenous advantages:

- ❏ on-site re-configuration, according to the prevailing operational requirements

- ❏ easily up-gradable, in terms of processing power and number of operator terminals

- ❏ standard interface to other systems/networks

- ❏ compatibility with a wide range of hardware platforms, either commercial, ruggedised or mil-spec personal computers/workstations

1.2 Functional Aspects

1.2.1 MESSAGE PROCESSING

For message reception, every incoming message is scrutinised (automatic detection of the start and end of the message, for each and every circuit), a journal number is assigned to the message which is logged accordingly, the message received is appended to the message database and delivered for operator supervision.

The first step of the transmission process is the message drafting or preparation. This task is quite effortless, due to a set of facilities provided to the operator accordingly to the type of message and the specific operation, and also offering word processing capabilities.

The messages can be created from scratch or on the basis of existing ones. In addition, provisions are made to import messages stored in external media and also insert messages via paper tape punch/readers. Whatever the case, edition facilities are provided to prepare new messages or modify existing ones.

Facilities for selection of blocks of text to copy and paste (within a message or between messages) as well as find and replace tools are available, just as in any other Windows application.

The system provides facilities to retransmit and transfer messages between the different circuits.

Facilities to print messages are also provided.

1.2.2 MESSAGE RELAYING

An additional distinguished feature of the system is the capability to perform as a relay station.

The system can be configured for each communication circuit which are the destination circuits of the received messages. The relay operation can be:

- ❐ on operator's request, the operator indicates that the message is to be relayed and the system takes care of the remaining processing

␍ automatic, the system takes care of all aspects related to the relay process, in such a way that the operator does not have to worry about that

␍ semi-automatic, during message supervision the operator must acknowledge the relay operation.

1.2.3 MESSAGE DRAFTING

Messages can be created from scratch or on the basis of existing ones. In addition, provisions are made to import messages stored in external media and also insert messages via paper tape punch/readers. Whatever the case may be edition facilities are required to prepare new messages or modify existing ones.

Facilities for selection of blocks of text to copy and paste (within a message or between messages) as well as find and replace tools are available, just as in any other Windows application.

There is also a special editor for service and test messages. Circuit-specific test messages are available in the system, so that the operator does not have to edit such messages whenever he wants to check an established circuit.

1.2.4 IMPORTING AND EXPORTING MESSAGES

It is always possible to insert in the system messages prepared, received or transmitted by other ways than the system itself. For instance, a message prepared elsewhere and stored in an external media can be downloaded into the system for further action.

Messages can also be imported via paper tape punch/readers, which is especially useful for off-line encrypted messages.

Conversely, messages can be exported out of the system either via flash drive or paper tape punch/reader.

1.2.5 LOG

All relevant events are recorded in the system Log that can be read or printed but not changed. Each record in the Log database includes a descriptive text of the occurrence, the date/time at which the event took place and logged operator, if applicable. The records are further grouped into classes of events in order to simplify query procedures.

The following events are logged:

- ❐ start-up
- ❐ all received messages
- ❐ all transmitted messages
- ❐ access control
- ❐ system alarms
- ❐ agenda warnings
- ❐ message handling activities (either automatic or manual)
- ❐ configuration and set up changes
- ❐ circuit management operations
- ❐ messages relaying

1.2.6 ARCHIVE, BACK-UP AND RESTORE

Every message flowing through the system is automatically stored on disk (i.e., appended to the messages databases) so that it can be used later.

Nonetheless, the system provides back-up mechanisms, enabling messages to be stored on external media. Long-term message archives can therefore be created.

Messages previously backed-up can be restored into the on-line archive again, whenever necessary. Note the system handles messages stored on external media the same way as it does with messages on-line (for instance, it is possible to make copies of a message previously backed-up without having to load it in the system).

1.2.7   RETRIEVAL

Messages previously archived can be retrieved using any of the following criteria (or combination thereof):

❏   journal number

❏   type of message

❏   date-time

❏   circuit

❏   specified words or blocks of text

The operator has means to create, delete or change filters for message retrieval.

1.2.8   AGENDA

TerMSG4 Ships provides an *Agenda* facility, whereby operators can program in advance warnings the operator will use for his own purposes; the system will then take care of making them happen at the right time. It is also possible to define which actions are to occur only once or if they should be activated daily, weekly, monthly or last day of the month.

1.2.9   CONTROL AND SUPERVISION

The following control and supervision facilities are available to the TerMSG4 Ships operators:

❏   message generation and retrieval

❏   message correction and supervision

❏   circuits operation, monitoring and management

❏   queue management and view

❏   alarms monitoring and handling

The operators with supervisor privileges, besides the above mentioned facilities, are also able to:

❒   dynamically assign the logical circuits to the physical channels; this means that switching of encryption devices is not required. In fact, if a certain channel, either plain or secure, is not working properly, their functions can be easily and quickly assigned to another one.

❒   control the functional scope of the printer

❒   endorse security control, including password management and definition of user profiles (security level and access rights)

❒   resource management, including data storage devices. The system provides information about their status and contents, generating alarms and early warnings when the maximum capacity is being reached

❒   serial interfaces configuration (baud rates, protocols, character length, parity, start/stop sequences, etc.)

❒   program in advance several types of actions (agenda facility)

Upon power-up, the system recovers the configuration that existed before the interruption of the supply. However, the operator can select the default configuration.

1.2.10 SECURITY

TerMSG4 Ships on its own is protected against unauthorised use by keeping track of its operators, associated passwords and security levels. If the correct name and password are not given during the start-up process, the system will not accept further commands.

TerMSG4 Ships supports several levels of access, typically: supervisor and operator. The supervision functions can be carried out in any of the workstations. Supervisor privileges are password protected.

All relevant events are recorded in the system Log that can be read or printed but not changed. Each record in the Log database includes a descriptive text of the occurrence, the date/time at which the event took place and logged operator, if applicable.

1.3 System Architecture

As already emphasised, the TerMSG4 Ships configuration that best suits a particular class of ships strongly depends on their operational role, survivability requirements and budget constraints. For a typical ship no more than two workstations would be required, as illustrated in the Figure 1.
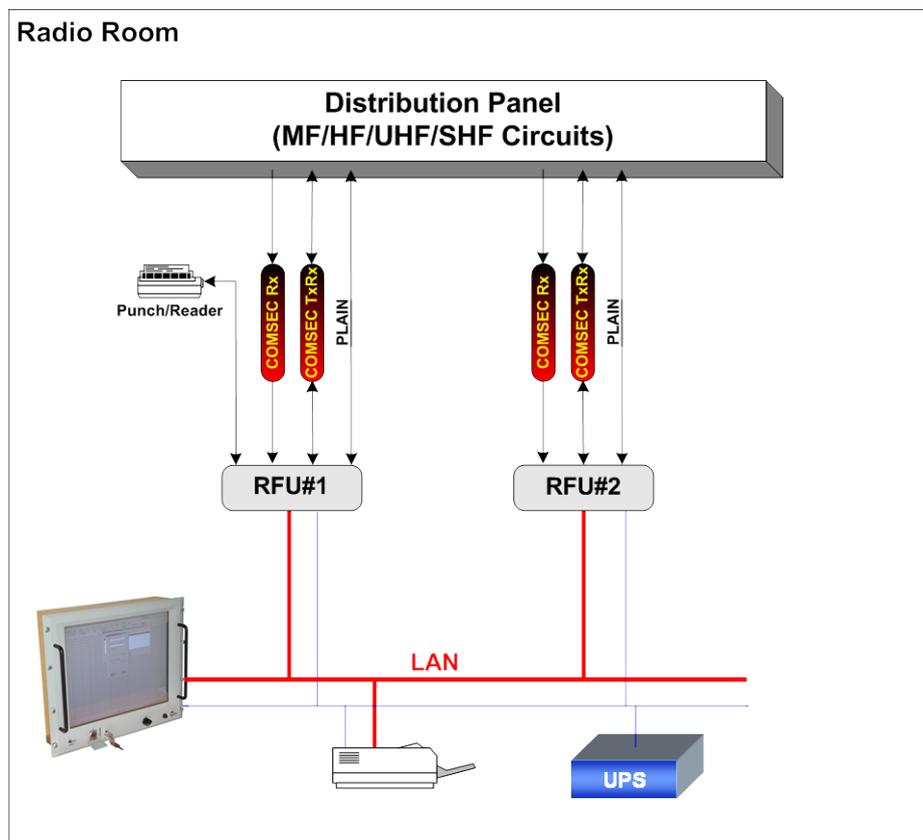

Figure 1 - TerMSG4 Ships configuration example

The RFU(C) provides the interface to the ship's telegraphic channels, either plain or secure. Provision is made for the connection of secure and plain channels. Expansions are easily made through additional RFUs.

The system should also include an Uninterrupted Power Supply to avoid data corruption in case of a ship's mains failure.

1.4 Hardware Structure

This section provides a description of the system hardware. Given the multiple solutions that may be adopted, several alternatives can be considered, enabling the Customer to choose the one that best fits its requirements and budget.

Being specific, either commercial-off-the-shelf, yet reliable, hardware platforms or ruggedised computer chassis can be used.

It shall be emphasised that hybrid solutions, with different workstation types may always be selected.

1.4.1   REMOTE FRONT-END UNIT - RFU(C)

The RFU(C) is a front-end communications unit, providing the interface to the communications/COMSEC equipment and is responsible for the TerMSG4 Ships signal transmission and reception.

A typical RFU(c) unit includes, see Figure 2:

- ❏ DCI Data and Control Interface module

- ❏ AC/DC Power supply

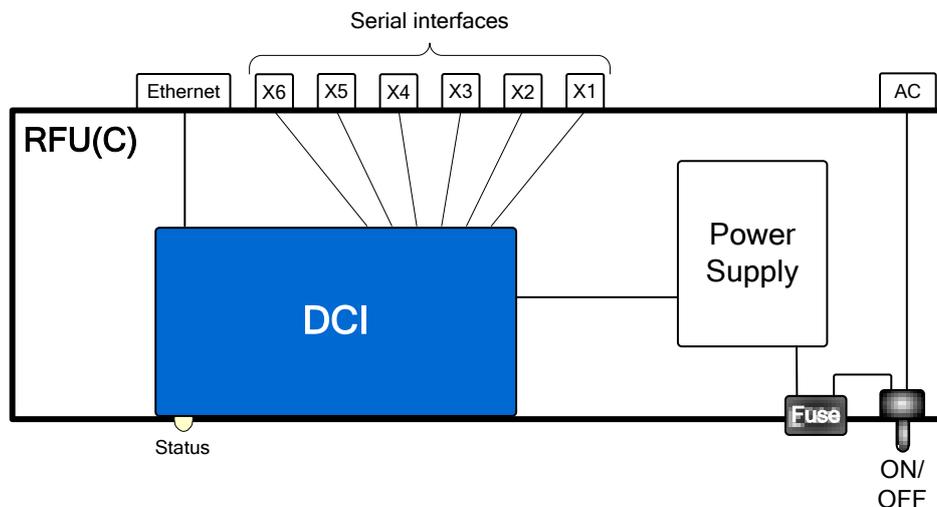- ❏ Front panel components, connectors and wiring as necessary to connect the various elements together.

Figure 2 – RFU(C) Block diagram

The _**D**ata and **C**ontrol **I**nterface_ (**DCI**) enables the interface to the serial ports of communications/COMSEC equipment. Besides serial and parallel ports, this module also includes a 10BaseT Ethernet Interface. Digital I/O lines are also available for special purposes.

Given the diversity of interface requirements, resulting from the wide range of communications equipment that are integrated, **DCI** are designed to ensure interface compatibility with existing equipment (either new or existing) thus avoiding new designs whenever changes occur in the communications outfit. On-going and future equipment developments are also taken into account, as far as possible.

The AC/DC converts the main's network (115/230 Vac) into the dc voltages required by the DCI module.

The **RFU(C)** consists of 1U height unit adequate for 19″ rack/console installation. Connections to the RFU(c) are made through receptacles mounted in the rear panel of the unit. The number and type of interface connectors will be customised in accordance with the number of equipment interfaces. An example of a typical RFU(C) is shown below.

Figure 3 – Front and Rear views

The specifications of the **RFU(C)** are as follows:

Interfaces

Serial Interfaces...............................up to 8

RS232/RS422/RS423/MIL-STD-188C/V28/V10/V11, synchronous or asynchronous

RS232/RS423/V28/V10 Protocol signals (RTS / CTS / CD / DSR / DTR / RI)

RS232/RS423/V28/V10 Clock signals
Baud rate: configurable from 75 to 57600
Nº of stop bits: 1, 1.5, 2
Parity: none, odd, even

Ethernet Interface ....10 BaseT according to IEEE 802.3

Digital inputs ....optically isolated, voltage detection between 5V and 12V, 500Vrms isolation

Digital outputs ....Solid state relay; 500Vrms isolation

Power Supply...................................115/230Vac ± 10%, single phase, 47 to 63Hz

Operating temperature range.............0 to 50º C

Humidity ....up to 95% non-condensing