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TT-6000 Inmarsat-C LES
Telnet (TCP/IP)
User Interface Manual (USM030)
TT-99-103879 Version 1.2.2

Thrane & Thrane

TT-6000 Inmarsat-C Land Earth Station

Telnet (TCP/IP)

User Interface Manual

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1. INTRODUCTION

1.1. SCOPE AND PURPOSE

This document describes the user interface for the telnet/push service of the Thrane & Thrane Inmarsat-C LES.

1.2. ABBREVIATIONS

LES Land Earth Station

1.3. REVISIONS

1.2.0	Initial version derived from the original psdn 2-stage user interface manual.
1.2.1	New description of error text strings. New description of time limit for message, interpret negative number as minutes instead of hours.

1.4. REFERENCES

[1] TT 99-108806 API-Header Description

2. INMARSAT-C TELNET/TCP INTERFACE.

The Inmarsat-C is a store and forward mailing system, which enables the user to send and receive data to and from mobile terminals in the Inmarsat-C system.

The Inmarsat-C system offers:

- Data transmission to and from a mobile unit.
- Broadcast data to groups of mobile terminals.
- Manage position reporting from fleets of mobile units.
- Unique polling system, that enables subscriber with Internet access to request various data from the mobile units.

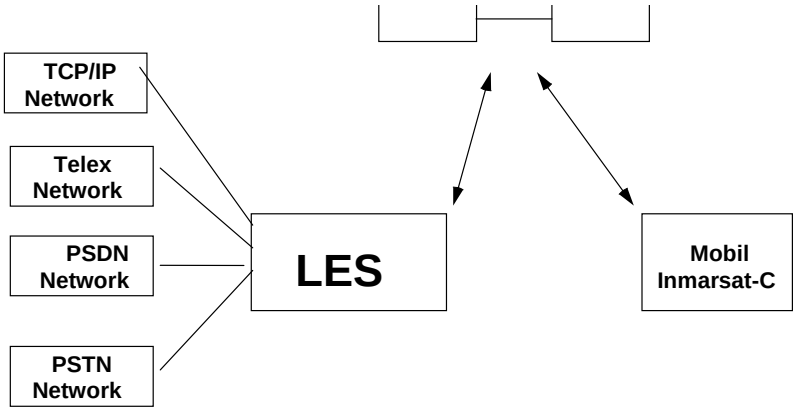


Fig 1 Sketch of the Inmarsat-C system.

3. ACCESS TO INMARSAT-C TELNET/TCP INTERFACE.

The Telnet/TCP service is accessed through an IP based network infrastructure (e.g. Internet). The service is offered through two interfaces:

- Telnet, for incoming 2-stage calls from a subscriber.
- Tcp/Push for outgoing calls to a subscriber.

3.1. TELNET INTERFACE

The telnet service provide access to a 2-stage interface through which the subscriber can initiate a number commands. The interface can be accessed by:

- Interactive users who connects by a standard telnet client application.
- Automated applications connecting by a standard TCP socket connection.

The 2-stage commands available through the telnet interface are described in section 4.

The LES Operator will announce the IP address and port, necessary for connecting to the telnet service.

3.2. TCP/PUSH INTERFACE

The TCP push interface is used by the LES to forward messages to the subscriber. Messages are forwarded when present in the message store. The LES will open a TCP connection to a certain IP address/port at the subscriber premises. The address/port will usually designate an automated subscriber application capable of receiving and processing messages.

Messages are forwarded as a stream of octets through the TCP connection. A message may or may not contain a header with the originator address, message reference number etc. However this is configurable within the LES and thus may vary from LES to LES.

Message headers are described in [1]. The message header format will usually be used by the receiving application for decoding the individual messages from the data stream.

In case the message forwarding fails (see appendix 8), the LES will do a predefined number of retries.

4. TWO STAGE INTERFACE

The Terrestrial user establishes a TCP connection to an IP-address/port on the LES. When connected a conversation command interpreter is invoked and the user will be asked to enter Username and Password. This means that the service will normally only be available to registered users.

However, user registration may not be required, in which case the user will not be prompted for username and password. Selected services may require user registration and the user will then be prompted upon selecting such a service.

Welcome to Land Earth Station
Please enter username: **username**
Please enter password: ******
> _

Note. Username and Password may be typed at the username-prompt separated by a space.

When the prompt ">" is sent, the station is ready to accept input. The expected input from the user, are commands specifying the action to be carried out. The following commands are available:

SEND	Send a message to one or several mobile terminals. Within the message, parameters regarding the transmission can be entered.
DSEND	Send a message to one or several mobile terminals using distress priority. Within the message, parameters regarding the transmission can be entered.
VIEW	View one of the previously entered messages.
DELETE	Delete one of the previously entered messages.
ADDRESS	Update address of one of the previously entered messages.
SCAN	Get status on previously entered message(s).
EGC	Enter an EGC message for one or several ships.
MAIL	Get an overview of mailbox(es).
READ	Retrieve messages from a mailbox.
DNID	Retrieve data from a closed network id mailbox.
POLL	Enter a polling command to one or several mobiles.
USER	Enter user name and password.

PIN	Change password.
HELP	Get help.
QUIT	End the session.

Fig 2. Two Stage commands.

Only the bold letters of the commands need to be entered. Both upper- and lowercase letters are accepted.

If a user does not want to have conversation with the Land Earth Station, the letters "CI" must be sent immediate after the connection is established. The station will then inhibit all transmission to the user except: the very first prompt, reference numbers allocated at a submission and error messages.

The command interpreter will input one whole line (all characters up to a Carriage Return) and then evaluate it. If the command is recognised, it will be carried out. The command interpreter is configured with an inactivity timer, which will close the connection if a certain period of inactivity is detected. The inactivity timer can be up to 30 minutes, but 2-3 minutes is common.

Should the user want to terminate a command while it is executing, the connection should be closed. For instance: if a Send command is initiated and the user wants to cancel the command while entering the message, the only way to do so, is to close the connection.

4.1. SEND

The send command can be used to enter messages to Mobile Inmarsat-C terminals. When the send command has been issued, a prompt asking for the destination appears:

```
To: _
```

After the **To:** prompt, a mobile number has to be entered, before the text entry state is entered as indicated by the following prompt:

```
Text: _
```

The user now enters his text and stops the message input by entering the command **.S** on a blank line.

Before typing the actual message to the mobile unit, the user can specify a number of send commands regarding parameters for the transmission. The commands are all designated by a dot (".") appearing at the start of a line just before the command.

The following commands are available:

.CC <no> — **Carbon copy.**
Sends a copy to other destinations. (Several cc commands can be issued for one transmission, each specifying extra destinations).

.TA <hours> — **Time Activate.**
The actual delivery will be delayed a number of hours.

.TL <hours> — **Time Limit.**
Delivery limited to a certain number of hours from the submission time. If the LES has not succeeded to deliver the message within the specified number of hours, the LES stops retrying and the call will be regarded as failed.

The TL command can also specify a negative number, causing the number to be interpreted as minutes instead of hours (e.g. -10 equals 10 minute time limit). Negative time limit numbers is an optional feature available on certain LESs only)

.DAR [address] — **Delivery Acknowledgement Requested.**
The LES will send an acknowledgement when the delivery has taken place or has failed. Without this option notification will be sent only if the LES failed to deliver the message. The 'address' parameter is optional. It enables you to direct the notification to a specific address. The address will by default be interpreted as a PSDN address type. If the address contains a dot (.) the TCP-push address type is selected.
It is also possible to specific default notification address for the

registered user at the LES, in which case the address can be omitted.

.ITA2 **Forward to mobile using ITA2 (5-bit) alphabet.**
Default is IA5 (7-bit) alphabet. By using this option, the transmission over the satellite link will done in 5 bit per character, which is significantly cheaper. This applies to all specified addresses. ITA2 support a smaller character set compared to IA5.

.DATA <number bytes> **Forward to mobile using 8 bit data.**
By using this option, 8 bit data can be forwarded to the mobile unit. All bytes received from the next line on will be perceived as 8 bit data. In order to avoid any misinterpretation of the CR LF or CR ending the keyword line, you may optionally included a STX (02 hex) character after the CR LF or CR to signal start of data. The STX character will not be forwarded. When the LES has received the specified number of bytes, the LES will commence forwarding the data.

.HEX **Decode text from 2byte hex octets**
The message text is decoded before storing by translating 2 bytes into 1 byte. Each 2 bytes are assumed to be a hex encoded octet (e.g. 2 bytes: 'A1' equals 1 byte: 161).
This scheme allows the user to transfer 8bit data through a 7bit communication network (i.e. Internet).
Message is stored using presentation: 8bit/transparent data.

.LOW **Low priority.**
By using this option you can specify, that the message is low priority and may be scheduled at a later time.

.HIGH **High priority.**
By using this option you can specify that the message must be delivered as quickly as possible, before any lower priority messages.

.S **Send.**
Stop text entry and begin forwarding the message.

The commands can also be used at the command line, the following examples does the same:

```
> SEND  dar, to 482380010, ta 24, cc 482380040, ita2
Text:
Dear Charlie, please send the documents on Monday
              Best  regards
              John.
.s
111 characters.
 Storing message...
Submitted 99-01-31 12:15. Reference number 045678.
> _
```

```
> SEND
To:
Text:
.ita2
.dar
.cc 482380010
.ta 24
.cc 482380040
Dear Charlie, please send the documents on Monday.
              Best regards
              John.
.s
111 characters.
 Storing message...
Submitted 99-01-31 12:15. Reference number 045678.
>
```

Comma, colon or space must be used to separate commands on the command line. When the message has been submitted, the time and reference number is shown. This reference number is a unique number for this message, which can be referred to later.

The TA, DAR and TL send commands acts on the first address after the command. In the example above Delivery Acknowledgement is requested on 482380010 but not on 482380040. Message forwarding to 482380040 will commence in another 24 hours.

Please note that commands shall only be prefixed with a dot when they appear in the text field.

```
> SEND  dar, to 482380010, ta 24, cc 482380040, ita2
Text:
Dear Charlie, please send the documents on Monday
              Best  regards
              John.
.s
111 characters.
 Storing message...
Submitted 99-01-31 12:15. Reference number 045678.
> _
```

Note. All characters in the text field will be forwarded just as received, i.e. if the lines in the message text is separated by only a carriage return, then the message will be forwarded with only a carriage return. It is strongly recommended to send lines separated by Carriage Return (CR) followed by a Line Feed (LF). This will ensure that the mobile unit will handle the message correctly.

Below is shown an example on forwarding 8 bit data using Two Stage.

```
> SEND  482380010 data 10
Data:
1234567890
10 characters.
 Storing message...
Submitted 99-01-31 12:15. Reference number 045678.
> _
```

Please note that you must input exactly the number of characters specific with the “data command”. When the LES has received the specified number of bytes, the LES prints *Storing message...* . If less than the specified number of bytes is received, the LES will await further input until the inactivity timer close the connection.

4.1.1. ERROR SITUATIONS

If the number of the mobile unit is erroneous, the Send command will be aborted. This is also the case, if the mobile unit is logged out, barred or not commissioned. In these situations an error message stating the problem is generated.

If the maximum message size is exceeded, the message will be truncated, i.e. the message will be stored and forwarded as soon as the maximum number of characters has been received. Additional input is ignored. The maximum size will usually be 32Kb.

See appendix 9 for more information on error information.

4.2. DSEND

The dsend-command can be used to enter messages to Mobile Inmarsat-C terminals to be sent with distress priority. When the send command has been issued, a prompt asking for the destination appears:

```
To: _
```

After the **To:** prompt, a mobile number has to be entered, before the text entry state is entered as indicated by the following prompt:

```
Text: _
```

The user now enters his text and stops the message input by entering the command .**S** on a blank line.

Before the actual message to the mobile unit, send commands can be issued, which specifies certain parameters regarding the transmission. The send commands are all designated by a dot (".") appearing at the start of a line just before the command.

The following commands are available. The commands works as described for the SEND command.

.CC <no>	**Carbon copy.**
.TA <hours>	**Time Activate.**
.TL <hours>	**Time Limit.**
.DAR [address]	**Delivery Acknowledgement Requested.**
.ITA2	**Forward to mobile using ITA2 (5-bit) alphabet.**
.DATA <number bytes>	**Forward to mobile using 8 bit data.**
.S	**Send.**.

4.3. VIEW

View <ref_no>

When a message has been submitted, it can be inspected using the view command. The view command requires the user to specify the reference number of the message to be viewed.

```
> view 345678
Retrieving file...
Dear Charlie, please send the documents on Monday
            Best  regards
            John.
>
```

4.4. DELETE

Delete <ref_no>

If you want to cancel a previously entered message the delete command must be used. The Land Earth Station will tell whether it succeeded in deleting the message.

4.5. ADDRESS

Address <ref_no> <old address> <new address>

This command can be used to change the destination of a previously entered message. In addition to the parameters listed above the TA, DAR and TL commands (known from the SEND command) can be placed after the 'new address' field on the command line.

4.6. SCAN

The scan command makes it possible to retrieve status of your messages. Different scan possibilities are explained in the following sections.

4.6.1. SCAN ONE MESSAGE

Scan a specify message, by specifying the message reference number of the message:

Scan <ref_no>

4.6.2. SCAN SEVERAL MESSAGES

The scan command can be scoped to a certain date range or reference number range. For a specific date range, then enter

scan -d <YYMMDD> <YYMMDD>

Then all messages submitted in the range from the first date to the last date will be listed.

```
> scan -d 990101 990301
583000 482380001     poll 23-JAN-99 14:27      deleted
583011 482380001          23-JAN-99 16:05      delivered      1 attempts used
583022 482380001          23-JAN-99 17:01      delivered      1 attempts used
583023 482380002          23-JAN-99 17:02      delivered      1 attempts used
306213 482380001          24-JAN-99 11:48      delivered      1 attempts used
800210 482380002          25-JAN-99 15:53      delivered      1 attempts used
800210 482380001          25-JAN-99 15:53      delivered      1 attempts used
800211 482380002          25-JAN-99 15:54      delivered      1 attempts used
800211 482380001          25-JAN-99 15:54      delivered      2 attempts used
047700 482380001          25-JAN-99 16:41      aborted        1 delivery attempts
784502 482380001          26-JAN-99 14:26      delivered      1 attempts used
784503 482380001          26-JAN-99 14:27      deleted
059401 482380002     poll 27-JAN-99 14:27      delivered      0 attempts used
138631 482380001          06-FEB-99 14:12      deleted
059509     group/area poll 09-FEB-99 11:11      delivered      0 attempts used
059510     group/area poll 09-FEB-99 11:13      delivered      0 attempts used
358510     group/area poll 09-FEB-99 12:56      unknown
```

The general format is:

[ref] [msg type] [date] [time] [status] [actions]

where:

ref	is reference number of the message
msg type	is the actual type of message:
	poll,
	group/area poll
	EGC
	group/area EGC
	msg
date	the date of submission
time	the time of submission
status	the current status of the message:
	in progress, pending, rerouting, delivered, deleted by user, aborted
actions	what has been done to the message up to now.

For a reference number range scan you can enter:

scan -r <ref_num_low> <ref_num_high>

then all submitted messages with a reference number within that range will be displayed.

4.6.3. SCAN ALL NOT DELIVERED MESSAGES

To get a status of all undelivered messages, type:

scan -u

4.7. EGC

EGC <Ocean> <c1> <c2> <c3> <c4> <c5>

When the EGC command has been issued with proper parameters, the LES will display the prompt:

Text: _

The user then enters his text and stops the entry by typing "**.S**". The following send commands are available when inputting the EGC message:

.DAR — **Delivery Acknowledgement Requested.**
The LES will send an acknowledgement when the delivery has taken place or has failed. Without this option, notification will be sent only if the LES failed to deliver the message.

.TL <hours> — **Time Limit.**
Delivery limited to a certain number of hours from the submission time. If the LES hasn't succeeded to deliver the message within the specified number of hours, the LES stop retrying and the call will be regarded as failed.

.ITA2 — **Forward to mobile using ITA2 (5-bit) alphabet.**
By using this option, the transmission over the satellite link will done in 5 bit per character. This option overrides the presentation set in parameter C5.

.DATA <number bytes> — **Forward to mobile using 8 bit data.**
By using this option, it is possible forward 8 bit data to the mobile unit. All bytes received from the next line on will be perceived as 8 bit data. In order to avoid any misinterpretation of the CR LF or CR ending the keyword line, you may optionally included a STX (02 hex) character after the CR LF or CR to signal start of data. The STX character will not be forwarded. When the LES has received the specified number of bytes, the LES will commence forwarding the data. This option overrides the presentation set in parameter C5.

.HEX — **Decode text from 2byte hex octets**
The EGC text is decoded before storing by translating 2 bytes into 1 byte. Each 2 bytes are assumed to be a hex encoded octet (e.g. 2 bytes: 'A1' equals 1 byte: 161).
This scheme allows the user to transfer 8bit data through a 7bit communication network (i.e. Internet).
Message is stored using presentation: 8bit/transparent data.

For a further description of the command line parameters, see appendix A.

4.8. MAIL

It is possible to have one or several mailboxes at the LES. This allows you to have traffic redirected and to retrieve the messages later on. This is very useful in case you do not have a receiving application at your premises.

A mailbox is identified by a number which normally will be your subscriber number in the PSDN network or some other network (PSTN, TELEX, ...). When accessing mailbox data from the PSDN, the default mailbox type is PSDN. However, should you want to access a PSTN mailbox, you can do so by specifying the keyword PSTN after the command.

In the following the command line syntax for the Mail command is shown. To get the actual messages within a mailbox, use the READ command.

4.8.1. LIST ALL MAILBOXES

This gives you a list of all your mailboxes. This also includes any PSTN or other type of mailbox, that you might have. The number of messages in each mailbox is shown.

mail

4.8.2. LIST ONE MAILBOX

This gives you a list of the messages within the specified mailbox. You must supply the correct mailbox number and in case the mailbox is a PSTN-type mailbox, you must specify the keyword PSTN. For the PSDN-type, do NOT specify the type.

mail <mailbox number> [PSTN]

4.8.3. LIST ALL NOT RETRIEVED MESSAGES

This gives you a list of all not retrieved messages. In case it is a PSTN-type mailbox, you must specify the keyword PSTN. For the PSDN-type, do not specify the type.

mail -u mailbox number [PSTN]

4.9. READ

The READ command is used to retrieve message(s) from a mailbox.

4.9.1. GET ALL MESSAGES FROM A MAILBOX

This gives you the total content of the specified mailbox. The mailbox can contain several messages, which will all be forwarded by this command.

read <mailbox number> [PSTN|PSDN]

4.9.2. GET ONE MESSAGE FROM A MAILBOX

If you prefer to get the messages one by one, you should specify the message reference number as well as the mailbox number. Use the MAIL command to have the contents of the mailbox listed; i.e. to get the message reference number.

read <mailbox number> <message reference number> [PSTN|PSDN]

4.9.3. READ USER ACKNOWLEDGMENT

The user can instruct the LES to wait for application/user acknowledgment before considering a message delivered (see section 8.2).

read <mailbox number> <message reference number> <PSTN|PSDN> <act_timeout>

The arguments are:

- Mailbox number, identifying the user's mailbox.
- Message reference number, identifies a specific message. Use 0 (i.e. zero) to read all unread messages in the mailbox.
- PSTN|PSDN, specifies the mailbox type.
- Act timeout, specifies the number of seconds the LES should wait for acknowledgment from the user. If timeout is exceeded the message will remain unread in the mailbox.

4.10. DNID

When data reporting is used, a closed network id will exist, which the mobile units will address. The Land Earth Station can forward all data received for a closed network id automatically, or it can be retrieved with the following command:

DNID <Dnid number> <Ocean>

For each data report, the following format is used:

```
<header info>
<raw data (type, length, CRC, DNID no and member no is excluded from Inmarsat-C
  packets)><NL>
```

The header info is programmed by the LES operator and it can be either empty, textual or an API - header.

In case of multi-burst data reports, there will still only be delivered one structure as sketched above, and the raw data at the end, will contain data for all the bursts. If incomplete multi-bursts are received, then the actual received data can be forwarded with either missing bursts or with duplicated bursts.

If a mobile unit has sent the following unreserved data report on the satellite link:

type	04
DNID	01
DNID	2D
member no	01
data	31
data	32
data	33
data	34
data	35
data	36
data	37
data	38
CRC	Xx
CRC	Xx

it could look like this when it is retrieved:

```
> DNID 301 1
<Header Information>
12345678
> _
```

DNID files can be registered as:

- Mailbox type: If the DNID file is of the mailbox type, then the terrestrial user shall always retrieve the data himself by the DNID command in a two-stage connection.

- Immediate type: If the DNID file is of the Immediate type, then all data will be forwarded immediately when they are received from mobile units (e.g. through TCP push interface).

- Auto forward type: If the DNID file is of the Auto forward type, then the data will be automatically forwarded with certain regular intervals (e.g. through TCP push interface). The intervals can be configured by the "DNID –c" command (see below).

If auto forwarding has been specified, the time for forwarding the data can be changed by the user with the following command line:

DNID -c <Dnid_number> <Ocean> <Time string>

where

Ocean: One digit signifying the ocean of the DNID number

0 - Atlantic Ocean west
1 - Atlantic Ocean east
2 - Pacific Ocean
3 - Indian Ocean.
9 – All Oceans

Note ! Ocean region 9 can be selected to forward DNID files for all Oceans regions. The LES will forward all Ocean regions for which the DNID is valid.

Time string :: <Minute string> <Hour string> <Day string>

Minute string :: Specific minute(s) and/or range of minutes.

Hour string :: Specific hour(s) and/or range of hours.

Day string :: Specific day(s) and/or range of days. Sunday is 0.

Examples of time-strings:

0 15 1-5

Forward at 15:00 Mondays through Fridays.

10,20 8,12-15 *

Forward at 8:10, 8:20, 12:10, 12:20, 13:10, 13:20, 14:10, 14:20, 15:10, 15:20 on all days as indicated by the '*'.

4.10.1. DNID USER ACKNOWLEDGMENT

The user can instruct the LES to wait for application/user acknowledgment before considering a data report delivered (see section 8.2).

Dnid <Dnid_number> <Ocean> <act_timeout>

The arguments are:

- Dnid_number, identifies DNID.
- Ocean identifies the ocean.
- Act timeout, specifies the number of seconds the LES should wait for acknowledgment from the user. If timeout is exceeded the data report will remain undelivered in the DNID file.

4.11. POLL

Poll <Ocean> <P1> <P2> <P3> <P4> <P5> <P6> <P7> <P8> <P9> <P10> <P11> <P12>

When the poll command has been issued with proper parameters (Only the necessary parameters need to be entered), the text entry state is entered. The user then enters the text and stops the entry by typing "**.S**". The following command may be specified on the first line of message input.

.DAR	**Delivery Acknowledgement Requested.** The LES will send an acknowledgement when the delivery has taken place or has failed. Without this option, notification will be sent only if the LES failed to deliver the message. Note. The .DAR must be on the very first line.
.DATA <number bytes>	**Forward to mobile using 8 bit data.** All bytes received from the next line on will be perceived as 8 bit data. In order to avoid any misinterpretation of the CR LF or CR ending the keyword line, you may optionally included a STX (02 hex) character after the CR LF or CR to signal start of data. The STX character will not be forwarded. When the LES has received the specified number of bytes, the LES will commence forwarding the data.
.HEX	**Decode text from 2byte hex octets** The poll text is decoded before storing by translating 2 bytes into 1 byte. Each 2 bytes are assumed to be a hex encoded octet (e.g. 2 bytes: 'A1' equals 1 byte: 161). This scheme allows the user to transfer 8bit encoded data through a 7bit communication network (i.e. Internet). Message is stored using presentation: 8bit/transparent data.

The individual parameters are further described in Appendix B.

4.11.1. POLL RETRY

To retry a poll, you must specify the message reference number. The LES will then re-issue the original poll.

Poll -r <ref_no>

4.12. SLCA

The SLCA issues a Slot Logical Channel Assignment command. The command takes the following format:

Slca P0,P1,P2,P3,P4,P5,P6,P7,P8

The command and parameter are described in: Appendix C SLCA Parameters.

4.13. USER

User <username> <password>

If the user was not prompted for a username and password during login, user registration can be done by this command.

4.14. PIN

Pin <username> <old password> <new password>

Change the password. A password can be up to 19 characters long and contain all IA5 characters except the separation characters: "," (comma), ":" (colon) and " " (space).

4.15. HELP

When this command has been invoked, approximate one screen of general help will be presented to the user. If the command is issued with a command name as second parameter, a description of the syntax and use for that command will be given.

5. APPENDIX A EGC PARAMETERS

The EGC command syntax is

EGC ocean,C1,C2,C3,C4,C5

Comma, colon or space can do separation of the EGC parameters on the command line. In the following, a description of all the EGC parameters is given:

All group call messages have an EGC network id (ENID) implied which shall be downloaded once to the individual ships before the ship will recognise them. See example for how to download an ENID.

OCEAN_REGION:

One digit signifying the ocean where the broadcast should be transmitted.

0 - Atlantic Ocean west
1 - Atlantic Ocean east
2 - Pacific Ocean
3 - Indian Ocean.
9 - All oceans.

C1, Priority.

One digit indicating the priority of the message, coded as follows:

0 - Routine
1 - Safety
2 - Urgent
3 - Distress

C2, Service code

Two digits indicating the type of EGC packet is to be sent, coded as follows:

Code	Explanation	message type
00	General Call	System
02	Group call	FleetNET
04	Urgency Message, Navigational Warnings to Rectangular areas.	SafetyNET
11	Inmarsat system messages	System
13	Coastal Warning	SafetyNET
14	Shore-ship Distress alert to circular area	SafetyNET
23	EGC system message	System
24	Urgency Message or Meteorological and navigational Warnings to circular areas	SafetyNET
31	Meteorological or Navarea warning or Meteorological Forecast.	SafetyNET
33	Download Group Identity	System
34	Search and Rescue Co-ordination to rectangular area	SafetyNET
44	Search and Rescue Co-ordination to circular area	SafetyNET
72	Chart correction service	FleetNET
73	Chart Correction Service for fixed areas	SafetyNET

In the list is also indicated whether the service is of SafetyNET or FleetNET type, this information is needed when the repetition shall be interpreted.

C3, Address

An address string of up to 12 digits coded as relevant to the specific service code.

Type of message	Address	remarks
General Call	0	
Group call.	Up to 5 digits	ENID
Urgency message, NAV warning to rectangular area	12 digits	ex: 09N045E12123
Inmarsat system message.	Up to 2 digits	
Coastal Warning	4 digits	<Navarea><sub adr> <subject>
Shore ship Distress alert to circular area	10 digits	ex: 11N023E123
EGC system message.	9 digits	Mobile no
Urgency Message MET/NAV Warning to circular Area.	10 digits	ex: 56N025W123
Meteorological or Navarea Warning or Meteorological Forecast.	Up to 2 digits	Navarea
Download ENID	9 digits	mobile no
SAR Co-ordination to rectangular area	12 digits	ex: 34S120E56010
SAR Co-ordination to circular area.	10 digits	ex: 56N025W123
Chart correction services.	Up to 5 digits	ENID
Chart Correction Service for fixed areas	7 digits	

C4, Repetition Code

For FleetNET, System and SafetyNET messages:
Two digits indicating the repetition, coded as follows:

code	Remarks
01	Transmit once after receipt
11	transmit on receipt followed by repeat 6 minutes later
61	transmit 1 hour after initial broadcast (twice)
62	transmit 2 hour after initial broadcast (twice)
63	transmit 3 hour after initial broadcast (twice)
64	transmit 4 hour after initial broadcast (twice)
66	transmit 12 hour after initial broadcast (twice)
67	transmit 24 hour after initial broadcast (twice)
70	transmit 12 hours after initial and 12 hours after 2. broadcast (three times)
71	transmit 24 hour after initial broadcast and 24 hours after 2. broadcast (three times)

For SafetyNET and System messages.
The repetition codes are of the form <Multiplier><Delay> where <Multiplier> specifies the number of delay periods between each broadcast and <Delay> is a fixed number of hours.

The Multiplier digit may be any digit from 1 to 5 as follows:

code	Explanation
1	1 specified delay period between broadcasts
2	2 specified delay periods between broadcasts
3	3 specified delay period between broadcasts
4	4 specified delay periods between broadcasts
5	5 specified delay periods between broadcasts

The delay digit coding is as follows:

Code	Explanation
2	1 hour delay; no echo
3	1 hour delay; with echo
4	6 hour delay; no echo
5	6 hour delay; with echo
6	12 hour delay; no echo
7	12 hour delay; with echo
8	24 hour delay; no echo
9	24 hour delay; with echo

C5, Presentation

The presentation field is coded as follows:

Code	Explanation
0	IA 5 alphabet
6	ITA 2 alphabet
7	8 bit data

Example1:

Make ship 482380001 member of ENID 34, and delete ENID 622:

EGC 1,0,33,482380001,61,0
Text:
/2
/N/34
/D/622/
131,CNN International
.s

The first line specifies, how many commands the packet contains, hereafter each command is appearing with command letter and ENID number. Legal commands are D for delete and N for new member ship. After the command fields, the three digit LES Id and an information provider name is given, the string can be up to 25 characters.

Example 2

Broadcast FleetNET message to ENID 10311:

EGC 1,0,2,10311,1,0
Text:
Hamon fishing fleet rendezvous with mother ship at position 55 North, 36 W
. s

6. APPENDIX B POLL PARAMETERS.

The poll command syntax is

poll ocean,P1,P2,P3,P4,P5,P6,P7,P8,P9,P10,P11

Comma, colon or space can separate the poll parameters on the command line. In the following, a description of all the poll parameters is given.

All poll commands has a Data network id (DNID) implied which shall be downloaded once to the individual ships before polling can be utilised. This is done as sketched out in example 1.

OCEAN_REGION:

One digit signifying the ocean where the broadcast should be transmitted.

0 - Atlantic Ocean west
1 - Atlantic Ocean east
2 - Pacific Ocean.
3 - Indian Ocean
9 – All Oceans

Note ! Ocean 9 is only valid for individual Polls and has the effect that the LES automatically selects the current Ocean where the mobile terminal is logged in.

P1, Poll type

G - group poll.
I - Individual poll.
N - Area poll, Navarea.
R - Area poll, Rectangular.
C - Area poll, Circular.

P2, Data network id (DNID)

Up to 5 digits signifying the closed network id.

P3, Response type

D - Data report.
M - Message channel.
N - No response.

P4, Sub address

The sub-address at the mobile unit (0-255).

(Default value 0).

P5, Address

Address corresponding to the address type as listed in the table below.

Poll type	Address	Remarks
Group Poll	0	No address applies
Individual Poll	9 digits	Mobile number
Navarea Poll	Up to 2 digits	Navarea
Rectangular area Poll	12 digits	ex: 34S020E56010
Circular area Poll	10 digits	ex: 56N025W123

P6, command type

Cmd Type	Meaning	Poll Type, P1
00	Send unreserved report as required in response	G,I,N,R,C
01	Program Reserved data reporting. *)	I
02	Initiate Reserved data reporting. *)	G,I,N,R,C
03	Stop Reserved data reporting. *)	G,I,N,R,C
04	Program unreserved data reporting.	G,I,N,R,C
05	Initiate unreserved data reporting.	G,I,N,R,C
06	Stop unreserved data reporting.	G,I,N,R,C
07	Define macro-encoded message. *)	G,I,N,R,C
08	Macro encoded message. *)	G,I,N,R,C
09	Data transmission.	G,I,N,R,C
10	Download DNID.	I
11	Delete DNID.	I,G
64..127	User defined.	G,I,N,R,C

*) Not implemented!

P7, Member no

The member no (range 1-255), used in download DNID poll commands.

(default value 1)

P8, start frame

Start frame number (4 digits) used to program regular unreserved data reporting.

(default value 0)

P9, Reports per 24 hours

3-digit number indicating the count of data reports to be sent over 24 hours. (Maximum 500)

(default value 10)

P10, Acknowledgement

(default value 0)

P11, Spot id

(default value 0)

P12, MES Serial number

Serial number for the destination MES. Used for enhanced DNID download/delete using new R72 ESAS files for authentication.

(default empty).

Example 1:

connect ship 482380001 to DNID 123 as member number 1:

poll 1,I,123,N,0,482380001,10,1

example 2:

Request a data report from all mobiles connected to DNID 123:

poll 1,G,123,D,0,0,0

example 3:

Program unreserved data reporting from mobiles connected to DNID 11 with 10 data reports pr day:

poll 1,G,11,D,0,0,4,0,0,10

example 4:

Initiate unreserved data reporting from mobiles with DNID 22:

Poll 1,G, 22,D, 0,0,5

7. APPENDIX C SLCA PARAMETERS

Note: This is an optional service, which may not be enabled at all LESs.

The slca command takes the following format:

Slca P0,P1,P2,P3,P4,P5,P6,P7,P8

Comma, colon or space is valid separators between the slca parameters.

P0, command

The P0 parameter specifies the command type.

40 Create assignment by specifying all parameters for the assignment. If an assignment already exists with the same DNID this assignment is modified.

41 Modify existing assignment. Both command 40 and 41 can be used to modify an assignment, but the specific modify command allow the user to change individual parameters, and the user is not requested to provide serial number.

42 Delete assignment in mobile.

43 Mark assignment for deletion in LES. Mobile is instructed to delete assignment when mobile try to renew the assignment.

P1, mes_no

The P1 parameter specifies the mobile number.

[400000000..490000000]

P2, slc_no

The P2 parameter specifies the slot logical channel number for an existing assignment.

[1..255]

P3, dnid

The P3 parameter specifies the DNID for the SLC assignment.

[1..32767]

P4, member_no

The P4 parameter specifies the member number for the SLC assignment.

[1..255]

P5, packets_per_day

The P5 parameter specifies the packet per day for the SLC assignment

Packets per day (norminal interval,frame interval)

[96]	(	104	15 mins	)
[48]	(	208	30 mins	)
[24]	(	416	1 hour	)
[12]	(	832	2 hours	)
[8]	(	1248	3 hours	)
[6]	(	1664	4 hours	)
[4]	(	2496	6 hours	)
[3]	(	3328	8 hours	)

P6, packets_per_report

The P6 parameter specifies the number of packet per report.

[1,2,3,4]

P7, duration

The P7 parameter specifies the duration of the SLC assignment. The duration is measured as number of reports.

[0] Forever assignment

Other duration values are for future use.

P8, serial_no

The P8 parameter specifies the serial number for the mobile/ship board equipment. This parameter can be required for creating a new SLC assignment.

[*******]

P9, addr_type

The P9 parameter specifies the address type of SLC assignment.

[0, 3 or empty] DNID/Member report address type (Default)

[8] No DNID report address type.

The P0 parameter is mandatory for all commands while other parameters are mandatory/optional depending on command type.

Examples:

Slca:40,492380047,,1234,10,3,2	Create new forever assignment, or modify existing assignment.
Slca:40,492380047,,1234,10,3,2,,A123321	Create new assignment with serial number.
Slca:40,492380047,,1234,10,3,2,,A123321,8	Create new assignment with no DNID in data reports.
Slca:41,492380047,,1234,,8	Update interval for existing assignment.
Slca:41,492380047,,1234,,,3	Update packet per report for existing assignment.
Slca:41,492380047,,1234,,8,3	Update multiple parameters for existing assignment.
Slca:42,492380047,,1234	Delete existing assignment in mobile.
Slca:43,492380047,,1234	Mark existing assignment for deleting in LES. The assignment will be deleted in mobile next time the mobile try to renew the assignment.

8. APPENDIX C: RELIABLE DATA FORWARDING.

Message data from the LES to a subscriber is carried on a TCP connection. Though TCP is a reliable transport protocol, it is important to consider message data acknowledgment to ensure reliable message delivery.

A message delivered to a customer is be marked for deletion at the LES. It is therefore important to ensure that a message actually reach the customer, before marking it for deletion. When the LES has sent a message it will wait for an acknowledgment from the customer that data has been received.

If the customer does not acknowledge data, the LES will consider the message as: not delivered. The message may then be tried delivered at a latter stage.

The following acknowledgment schemes are supported:

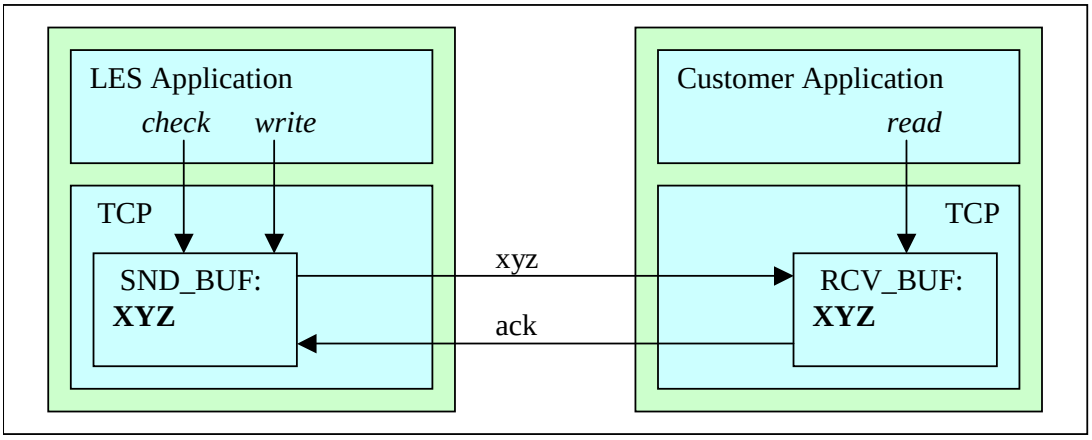
- Application layer acknowledgment (see section 8.1).
- TCP transport layer acknowledgement (see section).

TCP transport layer acknowledgement is always used by the LES to ensure that data reaches the TCP layer at the customer. TCP acknowledgment can be used as the only type of acknowledgment, or it can combine with: application layer acknowledgement.

Application layer acknowledgment provides a complete reliable delivery scheme, since it is ensures that data is received and properly processed by customer before it is considered delivered by the LES.

8.1. TCP TRANSPORT LAYER ACKNOWLEDGMENT

The telnet and push interface use TCP transport level acknowledgment to ensure that data reaches the TCP layer at the customer. This section describes details and limitations concerning TCP acknowledgment.



The LES delivery scheme is integrated with the TCP protocol layer. A SND_BUF is associated with each TCP socket connection, and it contains bytes not yet acknowledged by the receiver (i.e. customer). The LES will await the number of bytes in SND_BUF to reach 0, before the outstanding bytes are considered delivered. This scheme ensures that data has reached the TCP protocol layer at the customer.

This scheme ensure that data has been received by the peer TCP protocol layer, but it does not ensure that the customer application has actually read and processed the message. Data received by a TCP protocol layer, is stored in a RCV_BUF. The customer application reads data from this buffer. It is important that the customer application reads the data from the TCP layer as soon as possible. If a socket closes or fails, data in the socket' RCV_BUF can be lost. If data in RCV_BUF is lost, and the TCP layer has already acknowledged the reception of the data, messages can be lost.

A TCP connection can be terminated/routed between LES and subscriber (e.g. TCP/IP to X25). In this case the LES may get the acknowledgment from an intermediate device and not from the actual customer. This may break the end-to-end TCP acknowledgment

8.1.1. ACKNOWLEDGMENT DELAY

When the TCP layer at the customer has received a TCP packet from the LES, it must send an acknowledgment to the LES. To limit the number of network packets most TCP protocol stacks, will try to piggyback the acknowledgment, with another data packet to the peer. If there is no data going this direction the acknowledgment can be delayed (e.g. 200msec). The protocol will simply wait to see if customer will send something.

For applications receiving many small messages (e.g. data reports) the main performance limitations is the total round trip delay (not band width). The round trip delay include:

- LES sending the message

- Network delay
- Customer receiving the message
- Customer sending acknowledgment
- LES receiving and committing the message

The LES cannot forward a next message, until the current message has been acknowledged.

A big delay on the acknowledgment may cause the total throughput to drop substantially (e.g. factor 5).

The work around to avoid the customer acknowledgment delay is simple. The costumer application must send a single byte to the LES whenever it has received a complete message from the LES. The single byte will usually cause an immediate TCP packet to be sent, on which the acknowledgement can be piggybacked. In states where the LES awaits acknowledgment, data bytes from the customer are ignored. The single byte will therefore only be a carrier of the acknowledgment.

The work around can be used for:

- Push.
- Read 2-stage command.
- Dnid 2-stage command

8.2. APPLICATION LAYER ACKNOWLEDGMENT

Application layer acknowledgment enables the subscriber to read and process a message before acknowledging it to the LES. The application layer acknowledgment works as follows:

A message is sent to the subscriber as one or more TCP packets. When the subscriber application has received and processed a whole message, the application must return a 0xA (new line) byte to the LES. This byte is the application layer acknowledgment, and informs the LES that the subscriber has accepted the message.

If the application fails to return the acknowledgment, the message is considered: not delivered.

Application layer acknowledgement can be used for:

- Push (must be enabled on the LES).
- Read 2-stage command.
- Dnid 2-stage command

Application layer acknowledgement can not transparently be applied for existing PSDN/X25 customer applications.

Application layer acknowledgement will implicitly solve the acknowledgment delay described in section 8.1.1.

9. APPENDIX D: ERROR TEXT STRINGS

A 2-stage command can fail due to numerous reasons. When a command fails, the user is presented with an error text describing the cause of the error. The error text string was originally intended for interactive human users. Though the error text format and usage is not ideally designed for automated applications, the telnet/psdn 2-stage interface is widely used for such applications.

This appendix describes the error text strings which can be returned by a telnet 2-stage command. The appendix divides the error texts into 2 sections:

- Main errors for a 2-stage command (see section 9.1).
- Other errors and warnings not covered by the above (see section 9.2).

9.1. MAIN ERROR TEXTS

This section describes the main error texts. A rejected 2-stage command returns a main error text, describing the rejection.

> send to 492380001

Text:

Hi mom

.s

The following mobile units cannot be reached:

492380001: Unknown.

Failed: Cannot reach the mobile(s).

>

Fig 3 : Command error text sample

The "Cannot reach the mobile(s)" text is a main error text, informing the user about the command rejection. The main error text is usually preceded by "Failed:" (but not always), and is always followed by the terminal prompt.

Fig 3 also contains the text: "492380001: Unknown". This text is detailed error/warning information which is described in the following section 9.2.

The following table lists the main error texts which can be returned by the telnet service.

Error Text	**Description**
Cannot reach the mobile.	The request mobile can not be reached.
Cannot reach the mobile(s).	The request mobile or mobiles can not be reached.
No legal address.	Invalid address (e.g. empty mobile number)
No data to send.	Message (not egc or poll) require one or bytes.
Number of bytes too large	Size limit exceeded.

Time string longer than the allowed 39 characters.	
No DNID file found.	
Passwords doesn't match.	The PIN command requires existing password. This password must match the password, used at login.
Illegal ocean region parameter.	
No DNID in mobile's ocean region.	Poll 9 allows for download in all oceans. A DNID must be defined in for the current ocean wher ethe mobile is logged-in.
Mobile not in ocean region	
Illegal field value	General parameter/field error (e.g. egc and poll).
Memory shortage	Memory shortage in cles.
Messagestore full	CLes Message store is full, hence no space for further messages.
Unknown type of address	
Illegal address	
Illegal repetition code	
Illegal poll type	
Sequencenumber table is full	
Option not supported	
User is barred	
Network is barred	
Service is barred	
Unknown DNID	
Illegal destination	
Onestage access is barred	
Twostage access is barred	

Unknown mailbox	
DNID file is full	
DNID file is empty	
Unknown message	
Unknown ENID	
No matching message	
Message is being processed. Try again later	
Message has been rerouted	
Message cannot be deleted	
Unknown user	
Update of userinformation failed	
Message has been delivered	
Message has been aborted	
Message has been deleted	
To much data, please be more specific	
No message(s)	
The service is disabled	
Invalid time	
Missing user acknowledgment	Expecting acknowledgment user.
Traffic limit exceeded, Try again later	Traffic limit exceed for the current user.
Unknown command.	
Sorry, you have no access to this service.	
Sorry, you have no access to unreserved data reporting.	
Sorry, you have no access to DNID management.	
Sorry, you have no access to multi	

addressing.	
Sorry, you have no access to this service.	
Sorry, this service is only for registered users.	
Illegal parameter in view command.	
Too many commands during this session. Reconnect and try again...	Command limit exceed this session.
Illegal reference number in address command.	
Illegal parameter in delete command.	
Illegal address parameter.	
Illegal service code parameter.	
Illegal repetition code parameter.	
Illegal priority parameter.	
Illegal ocean region parameter.	
Illegal egc parameters	
Illegal parameters in program command.	
Area polls is not allowed for P6=11	
Sorry, serial number required.	
Only a individual poll is allowed for downloading DNID.	
Illegal member no in download command.	
Sorry, serial number required.	
Illegal command type.	
Illegal ocean region parameter.	
Illegal poll type parameter.	
Illegal DNID in poll command parameter.	
Illegal response type parameter.	
Illegal member number (0 - 255).	

Login incorrect.	
Command failed	General error text covering situations not listed above.

9.2. OTHER WARNING AND ERROR TEXTS

This section describes some warnings and errors not covered by the previous section.

> **egc 0,0,23,492380001,01,0**

Failed: Mobile 492380001 Unknown.

Failed: Cannot reach the mobile.

>

Fig 4 Other error and warning texts

The "Mobile 492380001 Unknown" is a warning/error text informing the user about a potential problem. This type of information can be either a warning or an error, and may occur in different part of the responds information.

The following table lists the warning/error error texts which can be returned by the telnet service.

Error Text	**Description**
Mobile X Unknown.	Mobile unknown
Mobile X Barred.	Mobile barred
Mobile X Logged out.	Mobile logged out
Mobile X Not in ocean region.	Mobile not in the proper ocean region.
Mobile X Not commissioned.	Mobile not commissioned
Mobile X Not OK.	Errors not covered by above cases.
You must enter some text before issuing the '.S' command. Please go on!	Warning instructing the user to provide at least 1 byte of message text.
Message too long, now truncated.	Warning information the user that message text is truncated.
Login incorrect.	