VMS Capsat® Transceiver

TT-3020C, TT-3022C, TT-3022D and

TT-3028CM

Configuration Manual

Thrane & Thrane

VMS Capsat® Transceiver

TT-3020C, TT-3022C, TT-3022D and

TT-3028CM

Configuration Manual

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1   Introduction

This manual provides instructions for configuring the Thrane & Thrane fishery transceivers and land mobile transceiver for use in Vessel/Vehicle Monitoring Systems. The manual provides information for both the TT-3020C SOLAS GMDSS Transceiver, the TT-3028CM Dual Mode SOLAS GMDSS Transceiver, the TT-3022D Non-SOLAS Fishery Transceiver and for the TT-3022C Land Mobile Transceiver.

The manual contains no information about general installation of the equipment. This information should be found in the relevant installation manuals. The TT-3020C Installation Manual (document number TT98-107880), the TT-3028CM Installation Manual (document number TT98-111327), the TT-3022D Installation Manual (document number TT98-107719) and the TT-3022C Installation Manual (document number TT98-107307).

This manual cover software versions from 3.28 and up.

1.1   An introduction to terms

This section describes the terms in vessel/vehicle surveillance that are needed to understand the role of Inmarsat and T&T in VMS.

The most important terms used in VMS are Land Earth Stations (LES), VMS Data Network Id (DNID) and Member numbers.

Figure 1 shows a typical transmission path of a position being transferred from the Inmarsat-C transceiver in a fishery vessel to the vessel surveillance centre. The same path applies - but in the opposite direction - for commands send to the vessel.
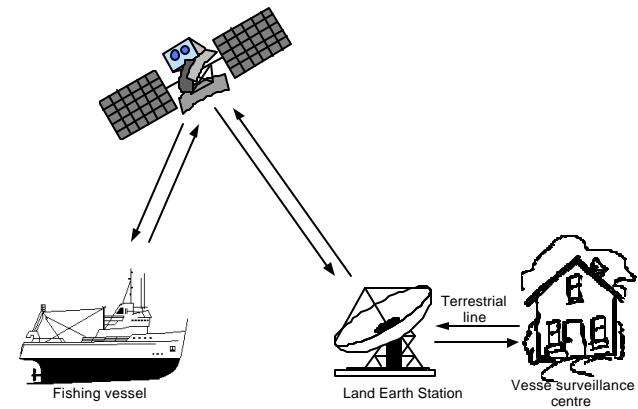
Figure 1 System Overview

When a position is transmitted from the vessel/vehicle to the sur-
veillance centre the address of the recipient must be known by the
Inmarsat-C transceiver otherwise the transceiver will not know
where to send it. This address is called the VMS DNID and VMS
LES. Figure 2 shows an antenna blocked position report being
sent to recipient LES 312 and DNID 12345.
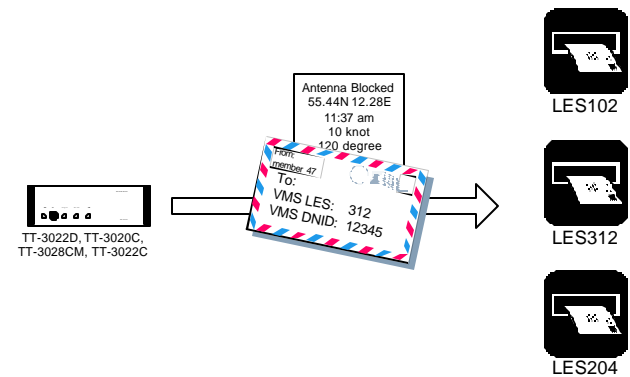
Figure 2 LES, DNID and member number

The member number has a similar meaning as the return address on an envelope. The member number is used by the ves-sel/vehicle surveillance centre to identify the transceiver that transmitted the position report.

When a position report is received by the Land Earth Station (LES) a DNID file is created from the packets received in the VMS DNID mailbox. The DNID file can then be forwarded to the fishery authori-ties or other vessel/vehicle surveillance authorities via the terres-trial line. The type of network used to access the Inmarsat-C Land Earth Station (X.25, PSTN etc.) is not discussed in this document. It is also important to notice that the LES interface varies with the dif-ferent producer of LES.

Position reports as transmitted by the Inmarsat-C transceiver are one or two 15 bytes data packets on the satellite link but this infor-mation is packed into a DNID format before it is transmitted to the vessel/vehicle surveillance centre. Therefore it is the DNID format that is being described throughout this manual.

1.2   Short feature description

The Thrane & Thrane Fishery Transceiver is the market leader in Inmarsat-C Vessel Monitoring Systems. The Transceiver has been approved as Fishery Monitoring Unit in a large number of countries and offers a great variety of configurations depending on the spe-cific needs .

In the following is a short list of the primary features in both of the Thrane & Thrane Inmarsat-C fishery transceivers.

- Freely configurable position reporting interval

- Detection and reporting of Inmarsat-C antenna blockage

- Detection and reporting of GPS blockage

- Configurable one or two packets report depending on the need for speed and course information.

- 4 different formats for date and time information

- Remote configuration from VMS centre of key features in the transceiver.

- Password protection of configuration and relevant commands.

- Possible reduced transmission mode with long and short reporting interval depending on vessel movements

- Button for initiating manual position report or indication in harbour status.

- Storing of up to 100 position reports when outside Inmarsat coverage

- Configurable macro codes for different events.

- Possibility of retransmission of failed reports

- Possibility of hiding transmission (Not applicable for SOLAS transceiver)

- Sleep mode where the transceiver automatic turns off to save power when not sending (Not applicable for SOLAS transceiver)

- Differentiation between "Power down" status and "Nice power down" status (special power off button).

- Surveillance zones giving a geographical area and a reporting interval to be used in that area .

The Thrane & Thrane Land Mobile Transceiver includes full VMS functionality identical to its maritime counterpart in both behaviour and in packet format.

1.2.1   Restriction to the SOLAS Fishery

Some of the features described in this manual are in conflict with the SOLAS GMDSS requirements. Therefore thes e features are **not** implemented in the TT-3020C SOLAS Fishery Transceiver or in the TT-3028CM Dual Mode SOLAS GMDSS Transceiver.

A short list of the missing features are listed in the following. A more comprehensive description of the feature is given in th e relevant sections of this manual.

- Nice Power Down Support. Please see section 4.1.8 .

- Disable Send LED on position report TX. Please see section 4.1.9

- Position report packet 2 - bit mask. Due to the fact that no GMDSS Message Terminal supports this feature. Please see section 4.1.22.

- Sleep mode. Please see section 4.5.

- Password protection of the commands "Login" and "Scan". Please see section 4.2 .

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2   LES Interface

This manual does not discuss the interface between the Vessel
Monitoring Centre and the Inmarsat-C Land Earth Station. However
a description of the DNID file format is discussed in section 2.1 as
this should give a good hand-on feeling of the actual information
that can be passed between the Vessel Monitoring Unit and the
Vessel Monitoring Centre.

2.1   DNID Common Format

The format of the DNID file on the LES depends on the configura-
tion of LES DNID account. In the following it is assumed that the
DNID files are stored using API headers. Please reed more in
about API headers in the document "TT-6000 Inmarsat-C Land
Earth Station API-Header Description".

In Figure 3 the common API Header is described and in Figure 4
the first part of the position report is illustrated. Finally in Figure 5
the format of the optional second position report is described.

2.1.1   API Header Format

0	01	1 byte	Indication of header start (EOH)
1	'T'	3 by tes	ASCII values for string "T&T"
2	'&'		i.e. byte values 54H,26H,54H
3	'T'		
4	01	1 byte	Type of API header (01 for DNID header)
5	22	1 byte	The length of this header in bytes
6	Msg. Ref. LSB	4 bytes	Message reference number
7	-		
8	-		
9	Msg. Ref. MSB		
10	Presentation	1 byte	Receive alphabet from satellite side message reception, see note 1
11	LES ID	1 byte	LES ID, can be used for identification of ocean region for multi ocean LES's
12	Data Length LSB	2 bytes	Number of data bytes following the header
13	Data Length MSB		
14	Stored time LSB	4 bytes	Giving the time of message store. The bytes given will be the number of seconds since January 1. 1970 0:0:0
15	-		
16	-		
17	Stored time MSB		
18	DNID LSB	2 bytes	The DNID of the file.
19	DNID MSB		
20	Member number	1 byte	Member number sent by the MES in the position report
21	02	1 byte	Indication of header end (STX)

Figure 3 API header of DNID file

2.1.2   First part of Positioning Report

```
22  | Cat |
    |     Position              2 bit   : Category field
23  |                          39 bit   : Position  -  Latitude  and
24  |                          Longitude
25  |
26  |_____
27  |     MEM                   7 bit   :   MEM   code   (Macro
    |                          Encoded Message)
28  | Attribute                2 bytes : Time and date of position
29  |
```
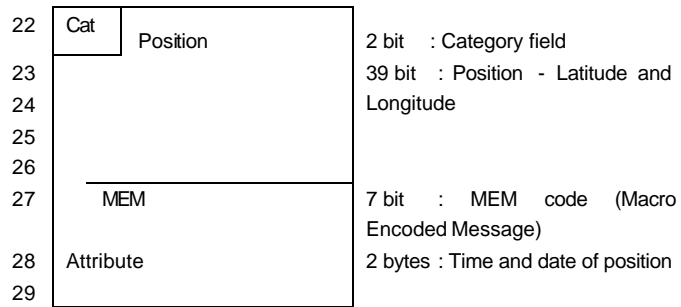
Figure 4 First Part of Position Report

The format of the category field, Position field, MEM code and Attribute field is described in the following.

2.1.2.1   Cat (2 bits)

The Category is set to 01B (Maritime) in all Position Reports generated by the TT-3020C SOLAS Fishery, the TT-3028CM Dual Mode SOLAS GMDSS Transceiver, the TT-3022D Non SOLAS Fishery transceiver and the TT-3022C Land Mobile Transceiver if configured for VMS. 01B indicates that the position in the report comes directly from the build-in GPS in the transceiver. A category field different from 01B indicates that this is an operator generated data report and the position is not included in the report.

2.1.2.2   Position (39 bits)

[Position] ::= [Latitude][Longitude]

Latitude (19 bits)

[Latitude] ::= [Hemisphere][Degrees][Minutes][Fractional part]

Hemisphere (1 bit)

A North/South flag. Set to 0 for North or 1 for South.

Degrees (7 bits)

The degrees of Latitude, North or South. 1 ° being 60 minutes.

Minutes (6 bits)

The integer part of the Minutes of latitude. 1 minute being 1 nautical mile - 1852 meters

Fractional part (5 bits)

The fractional part of the Minutes of latitude in units of 0.04 of a Minute i.e. ~74 meters.

Longitude (20 bits)

[Longitude] ::= [Hemisphere][Degrees][Minutes][Fractional part]

Hemisphere (1 bit)

An East/West flag. Set to 0 for East or 1 for West.

Degrees (8 bits)

The degrees of Longitude, East or West.

Minutes (6 bits)

The integer part of the Minutes of longitude.

Fractional part (5 bits)

The fractional part of the Minutes of longitude in units of 0.04 of a Minute.

2.1.2.3   Macro Encoded Message (MEM) (7 bits)

A Macro Encoded Message (MEM) is a pre-defined message represented by a unique 7 bit code. Please refer to section 4.1.20 for detailed description of Macro Encoded Messages.

2.1.2.4   Attribute (date and time) (16 bits)

Date, Time is put in this field and coded as:

[Date, time]::=[not used][day][hour][minute]

not used (1 bit):   Always 0

day (5 bits):   day of the month

hour (5 bits):   hour of the day

minutes (5 bits):   in units of 2 minutes

2.1.3   Second Part of Positioning Report

30	Speed	8 bit	: Speed
31	Course	9 bit	: Course
32	Reserved	15 bit	: Reserved
33			

Figure 5 Second Part of Position Report

The format of the speed and course field are described in the following.

2.1.3.1   Speed (1 byte)

Speed is coded as a one byte unsigned binary number with a resolution of 0.2 knots. If no valid data is available at the MES, the field should be set to "FFH".

2.1.3.2   Course (9 bits)

The Course is coded as a 9 bit unsigned binary number with a resolution of 1 degree.

2.1.3.3   Reserved (15 bits)

Unused and set to zero.

3   Initial setup of transceiver

The initial set-up depends on the choice of transceiver. In the fol-
lowing the initial configuration of the two different Thrane & Thrane
transceiver are described.

3.1   TT-3020C SOLAS Transceiver

The TT-3020C is a GMDSS approved Inmarsat-C transceiver for
SOLAS applications. When the transceiver has installed software
version V3.24 or above is approved for both GMDSS and fishery
surveillance.
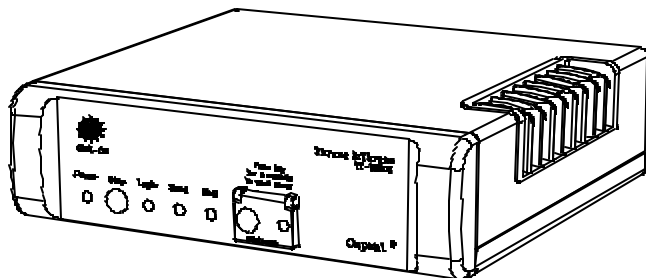
Figure 6 TT-3020C Maritime Capsat Transceiver

When receiving the transceiver the TT-3020C is default set to SO-
LAS Maritime behaviour i.e. no fishery surveillance is enabled.
Some configurations are necessary before setting the transceiver
on-air to fulfil the VMS requirements.

3.1.1   Making a SOLAS Fishery Transceiver

To change the TT-3020C SOLAS Maritime transceiver into a TT-
3020C SOLAS Fishery transceiver the command "SE-B" must be

executed in the transceiver terminal. The SE-B command enters the system parameter initialisation menu. Menu entry 7 *Change MES into SOLAS Fishery transceiver* changes the transceiver into a *SOLAS Fishery* transceiver.

Please notice that once the transceiver has been changed to a SOLAS Fishery it is no longer possible to change it back to a normal SOLAS Maritime transceiver.

The transceiver will automatically reboot when changing transceiver type and after power-up identify itself as a *SOLAS Fishery* transceiver.

TT-3020C SOLAS Fishery does not allow external position to set the position of the transceiver and therefore NMEA input is disabled.

3.1.2   Ocean Registration

When the transceiver is configured for SOLAS Fishery the transceiver will automatically login to the ocean region with the best signal (if not already logged in). Using the transceiver terminal command "SET -O" the preferred ocean can be configured and the transceiver will try to login into this preferred ocean when going on-air for the first time.

3.2   TT-3028CM Dual Mode Fishery Transceiver

The TT-3028CM is a GMDSS approved Inmarsat-C transceiver and Mini-M phone for SOLAS applications. When the transceiver has installed software version V3.24 or above is approved for both GMDSS and fishery surveillance.
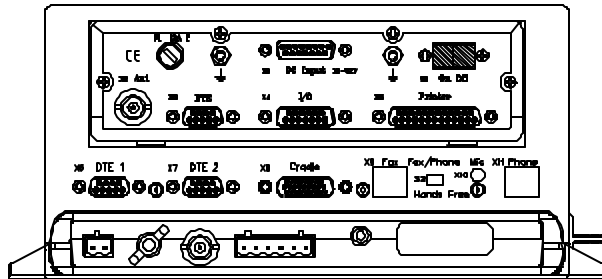
Figure 7 TT-3020C Maritime Capsat Transceiver

When receiving the transceiver the TT-3028CM is default set to SOLAS Maritime behaviour i.e. no fishery surveillance is enabled. Some configurations are necessary before setting the transceiver on-air to fulfil the VMS requirements.

3.2.1   Making a SOLAS Fishery Transceiver

To change the TT-3028CM SOLAS Maritime transceiver into a TT-3028CM SOLAS Fishery transceiver the command "SE-B" must be executed in the transceiver terminal. The SE-B command enters the system parameter initialisation menu. Menu entry 7 *Change*

MES into SOLAS Fishery transceiver changes the transceiver into a *SOLAS Fishery* transceiver.

Please notice that once the transceiver has been changed to a SOLAS Fishery it is no longer possible to change it back to a normal SOLAS Maritime transceiver.

The transceiver will automatically reboot when changing transceiver type and after power-up identify itself as a *SOLAS Fishery* transceiver.

TT-3028CM SOLAS Fishery does not allow external position to set the position of the transceiver and therefore NMEA input is disabled.

3.2.2   Ocean Registration

When the transceiver is configured for SOLAS Fishery the transceiver will automatically login to the ocean region with the best signal (if not already logged in). Using the transceiver terminal command "SET -O" the preferred ocean can be configured and the transceiver will try to login into this preferred ocean when going on-air for the first time.

3.3   TT-3022D Fishery Transceiver

The TT-3022D is an Inmarsat-C transceiver for Non-SOLAS appli-cations. All software version can be used for fishery surveillance but this manual describes feature available in V3.27 and above. When receiving the transceiver the TT-3022D is default set without fishery surveillance. Some configurations are necessary before setting the transceiver on-air to fulfil the VMS requirements.
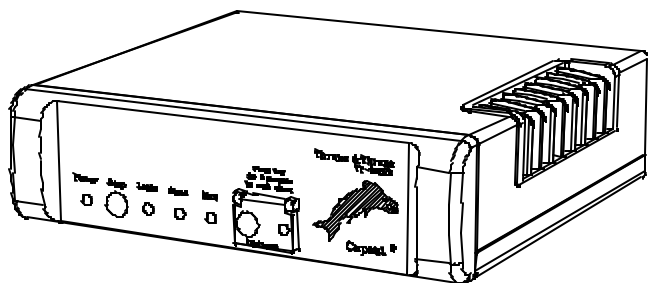
Figure 8TT-3022D Fishery Capsat Transceiver

3.3.1   Ocean registration

The TT-3022D transceivers will always automatically login into the ocean region with the best signal if the transceiver is logged out of the Inmarsat network.

However the preferred ocean can be configured by using the trans-ceiver terminal command "SET -O" and the transceiver will then try to login to this preferred ocean when going on-air for the first time.

3.4   TT-3022C Landmobile Transceiver

The TT-3022C is a Inmarsat-C transceiver approved for Landmobile applications. When the transceiver has installed software ver-sion V3.27 or above, it is approved for vehicle surveillance(VMS).
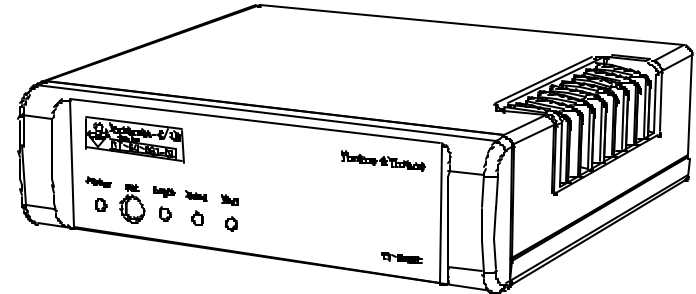
Figure 9 TT-3022C Land Mobile Transceiver

When receiving the transceiver the TT-3022C is default set to nor-mal landmobile behaviour i.e. no vehicle surveillance is enabled. Some configurations are necessary before setting the transceiver on-air to fulfil the VMS requirements.

3.4.1   Making a Landmobile vehicle surveillance Transceiver

To change the TT-3022C Landmobile transceiver into a TT-3022C Landmobile vehicle surveillance transceiver the command "SE-B" must be executed in the transceiver terminal. The SE-B command enters the system parameter initialisation menu. Menu entry 7 *Vehicle Surveillance System* changes the transceiver into a Land-mobile vehicle surveillance transceiver.

The transceiver will automatically reboot when changing trans-ceiver type. Using the command SE -b entry 7 again will change the transceiver into an normal Landmobile transceiver.

3.4.2   Ocean Registration

When the transceiver is configured for vehicle surveillance the transceiver will automatically login to the ocean region with the best signal (if not already logged in). Using the transceiver terminal command "SET -O" the preferred ocean can be configured and the transceiver will try to login into this preferred ocean when going on‐air for the first time.

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4   Transceiver Configuration

This chapter provides specific information enabling you to config-
ure the VMS functionality on one of the Thrane & Thrane Inmarsat-
C transceivers with a minimal effort.

The transceivers can be configured to a wide range of different
VMS functionality's. Not all functionality needs to be enabled. It de-
pends on the requirement of the VMS project.

4.1   Configuring the VMS behaviour

In this chapter each entry in the fishery configuration menu in the
transceiver will be described in details. The fishery configuration is
also the configuration to use in case of land mobile VMS configura-
tion.

The fishery configuration menu is entered using the transceiver
terminal command "FISHERY".

The command has the following format:

Command: Fishery configuration
Purpose: Configure the behaviour of the Fishery Transceiver
Format: FISHERY [sub-menu]
                    FI [sub-menu]

```
Fishery configuration
No   Field                             Current setting(s)

 0 : Quit
 1 : Set all values to default
10 : Date and time format                     : Default
20 : Antenna Blocked/Disconn followed
      by normal position report               : no
21 : Retransmit fail reports                  : no
22 : Blocked GPS detection                    : no
23 : Long to short report interval change     : no
24 : Nice power down support                  : no
26 : Disable Send LED on position report TX   : no
27 : Stop button initiates position report    : no
28 : Disable position report infos.           : no
29 : Password on da-command                   : no
31 : Only 1 packet per position report        : no
32 : Mask out speed and course                : no
33 : Disable GPS first fix beep               : no
34 : 'A' in provider downloads VMS DNID       : no
35 : Use VMS DNID for special reports         : no
36 : Hide remote connections                  : no
37 : Keep inactive connections                : no
40 : MEM Code translation table (HEX)         :
                                      0B 40 42 44 45 50 51
                                      52 53 55 56 57 58 46 47
50 : Position report packet 2 - bit mask (HEX):
                                      00 00 00 00 00 00 00 00
51 : Number of positions in storage queue     : 0
60 : Reporting intervals
      (long, short in minutes)                :360(2500) 120(833)
61 : Reporting interval change distance
      (in decameters)                         : 40
70 : VMS DNID (AORW, AORE, POR, IOR)          : 0    0    0    0
71 : VMS LES (AORW, AORE, POR, IOR)           : 0    0    0    0
72 : Number of active DNID in transceiver     : 25

Enter field number >
```

Figure 10 Fishery Configuration Menu (fi)

4.1.1   Quit

This entry will quit the fishery configuration menu and return to normal user interface.

The Quit command is executed by entering 0 in the fishery command entry.

4.1.2   Set all values to default

This entry sets the configuration of the transceiver to default VMS behaviour. The default values are described in each entry d escription.

The command is executed by entering 1 in the fishery command entry.

4.1.3   Date and time format

This entry is used to configure the format of the date and time information in position reports from the Transceiver.

The basic part of date and time information is identical for all configurations and the information is held in the API header (Figure 3) and in the first part of the position report (Figure 4).

If more detailed information is required the date and time format can be extended in three different ways.

This functionality is configured by entering 10 in the fishery command entry.

4.1.3.1   Setting 1 - default position report format

If the **Date and time format** entry is set to **Default** no further data is added to the DNID file.

4.1.3.2   Setting 2 - position report format 1

If the **Date and time format** entry is set to **Format 1** a more d etailed description of month and year is included in the position report. Please see Figure 11 to have an illustration of the format.

Additional date of position information is coded as:

[Additional date of position]::= [Month][Year[not used]

34	Month	Year	4 bits: full month information. Month 1-12
35	Year	not used	6 bits: 00 - 63: i.e. gives year 1997 - 2060 year added to 1997

Figure 11 Position report format 1

4.1.3.3   Setting 3 - position report format 2

If **Date and time format** entry is set to **Format 2** a more detailed description of month, year and minute is included in the position report.

Additional date of position information is coded as:

 [Extended Attribute]::= [S][Year][Month][Day][Hour][Minutes][not used]

34 35 36 37	Extended Attribute not used	28 bits: Detailed time of GPS position

Table 1 Position report format 2

Extended Attribute (date) (28 bits)

S(1 bit)	Spare
Year(7 bit)	00 - 99: i.e. gives year 1998 – 2097
Month(4 bit)	1-12: full month information
Day(5 bit)	1-31: day of the month (same field as in normal Attribute)
Hour(5 bit)	0-23: hour of the day (same field as in normal Attribute)
Minutes(6 bit)	0-59: full minute information
reserved(4 bit)	not used

4.1.3.4   Setting 4 - position report format 3

If **Date and time format** entry is set to **Format 3** full year description is included in the position report.

Additional date of position information is coded as:

Additional date of position]::= [S][Year][Month][Day][Hour][Minutes][not used]

34	S	Year			1 bit: spare 12 bit: Year - gives exact year 0000 – 4095
35			Month	4 bit: Month - 1-12: full month information
36		Day		Ho-	5 bit:Day - 1-31: day of the month (same field as in normal Attribute) 5 bit:Hour - 0-23: hour of the day (same field as in normal Attribute)
37	ur	Minutes			6 bit: Minutes - 0-59: full minute information
38		not used			7 bit: not used

Table 2 Position report format 3

4.1.4   Antenna Blocked/Disconnected followed by normal position report

If this entry is set to **Yes** every antenna blocked and antenna dis-
connected position report is followed by a normal position report
that includes the current position.

Position

First report
includes position
before blockage

Second report
includes current
position

Position when
blocked

Position when
Ok again

**Antenna blocked or
disconnected**   Time when position
reports are send   time
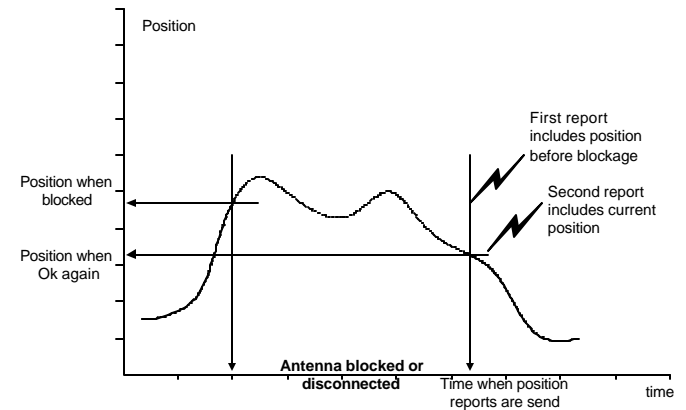
Figure 12 Antenna blocked/Disconnected reports

The functionality is configured by entering 20 in the fishery com-
mand entry.

4.1.5   Retransmit fail reports

If this entry is set to **Yes** a failed report will be retransmitted. I.e. a
failed antenna blocked position report will cause the antenna
blocked event to be re-initiated and cause retransmis sion of an a n-
tenna blocked position report to the VMS DNID.

The functionality is configured by entering 21 in the fishery com-
mand entry.

4.1.6   Blocked GPS detection

If this entry is set to **Yes** blockage detection on the GPS signal is done parallel to the blockage detection of the Inmarsat NCS TDM signal. If the GPS has no fix for 4½ minutes an antenna blocked position report will transmitted when the signal becomes OK again.

This is especially useful if a GPS jamming device is used to scramble the GPS signal.

The functionality is configured by entering 22 in the fishery command entry.

4.1.7   Long to short report interval change

This feature enables the transceiver to have two different position reporting intervals. A long reporting interval for use when the vessel/vehicle has not moved more that 400 meters since last report and a short interval at all other times.

If the entry is set to **Yes** and

- an Inmarsat PU interval connection is set-up for the VMS DNID.

- the reporting interval is longer than or equal to the long interval configured in fishery configuration entry Reporting intervals (section 4.1.23).

- the transceiver moves more than specified in fishery configuration Reporting interval change distance from the last reported position

then

- the positioning reporting program using the connection will be changed to the short reporting interval configured in Reporting intervals

The change in position is checked every 5 minutes.
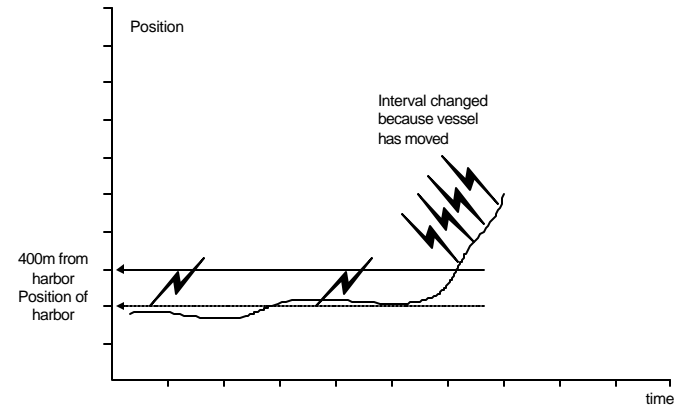
Figure 13 Automatic change of reporting interval

This feature is useful when a vessel is in harbour or vehicle is in home town because this will reduce the number of position reports and will therefore also reduces the cost of positioning reporting.

The functionality is configured by entering 23 in the fishery command entry.

4.1.8   Nice power down support

Please notice that this command is not supported in the TT-3020C SOLAS Fishery Transceiver nor in the TT-3028CM Dual Mode SOLAS Fishery transceiver.

If set to **Yes** the sleep mode functionality (see section 4.5) of the transceiver can be used to configured the transceiver for nice power down.

Nice power down is used when it is necessary to separate "supply power removed abruptly" from " supply power switched off nicely".

In addition to configuring this entry it is necessary to configure the sleep mode behaviour (see section 4.5.1). This is done using the terminal command "SL –i 0,0,0,0" which configures the sleep mode to no interval wakeup and no fix time wakeup.

The default configuration of the transceiver is sleep mode func-tionality disabled.

If **Nice power down support** is set to **Yes** and **S**leep mode is con-figured as **"SL –i 0,0,0,0"** then

- If the supply power is removed abruptly then the transceiver will indicate this by sending "Power Down Report" and "Power Up Report" when supply power has been re-established. The "Power Down Report" includes the last known position before the power was removed. The "Power Up Report" includes the current position.

Power Down Report
position report

MES
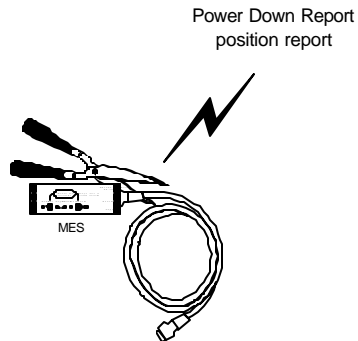
- If the supply power is removed using the remote switch then the transceiver will indicate this by sending an "Enter Sleep

Mode Report" ~1-5 min after transceiver is switched off and "Leave Sleep Mode Report" when transceiver is switched on again. The " Enter Sleep Mode Report " includes position at the time of transceiver is switched off. The " Leave Sleep Mode Report " includes position at the time of transceiver is switched on again. Please refer to section 4.5 Sleep mode for further description of transceiver behaviour.

Enter Sleep Mode Report
position report

MES
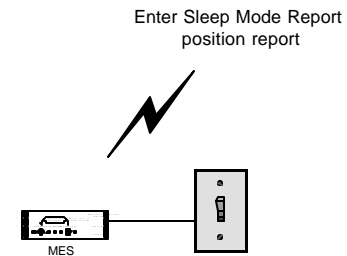
If **Nice power down support** is set to **No** and **S**leep mode is con-figured as **"SL –c"** then

- If the supply power is removed abruptly using the remote switch then the transceiver will indicate this by sending "Power Down Report" and "Power Up Report" when supply power has been re-established. The "Power Down Report" includes the last known position before the power was emoved. The "Power Up Report" includes the current position.

If **Nice power down support** is set to **No** and **S**leep mode is con-figured as **"SL –l x,x,x,x"** (x is any value) then

- Normal sleep mode configuration, please refer to section 4.5 Sleep mode.

The functionality is configured by entering 24 in the fishery com-mand entry.

4.1.9   Disable Send LED on position report TX

Please notice that this command is not supported in the TT-3020C SOLAS Fishery Transceiver nor in the TT-3028CM Dual Mode SOLAS Fishery transceiver.

This entry is used to configure that the transceiver doesnot light up the Send LED when transmitting position reports.

Usually the Send LED will lit while the transceiver is transmitting but by setting this entry to **Yes** the transceiver will only turn on the Send LED when sending messages, logging into/out of the network, during performance verification test, distress alert etc.

The functionality is configured by entering 26 in the fishery command entry.

4.1.10   Stop button initiates position report

The stop button can be configured for two different purposes. Either it will cause the transmission of a manually initiated position report or it will set the transceiver in In-Port mode where the number of position reports are reduced.

The feature is configured by entering 27 in the fishery command entry.

4.1.10.1 Transmit manual initiated position report

If this entry is configured to **Yes** the Stop button on the front panel of the transceiver (Figure 6 or Figure 8) can be used to initiates a position report with a MEM code that indicates that it is a manual transmitted position report.

The Stop button must be pressed for 4-5 seconds until a "beep" sound from the transceiver. This indicates that the transceiver has initiated a manual position report.

When pressing the Stop button less than 4 seconds the button has normal functionality i.e. acknowledging messages.

4.1.10.2 Set transceiver In-Port mode

If the entry is set to **Yes/in-port mode** then the stop button has the same functionality as described in section 4.1.10.1 however:

- if a Inmarsat PU interval connection is set-up for the VMS DNID

then

- the connection will be changed to the long reporting interval as described in section 4.1.23 Reporting intervals.
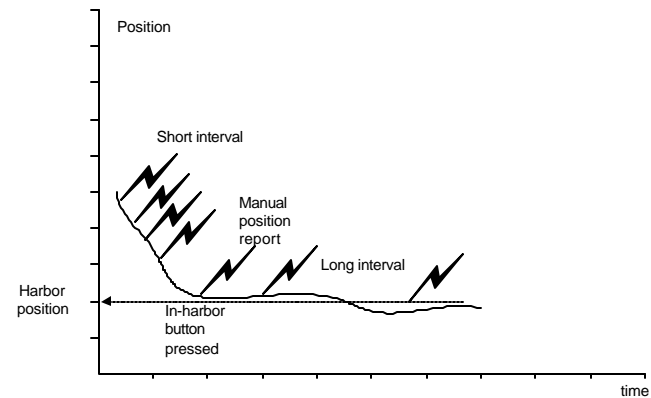
Figure 14 In-port button

This feature is useful when the vessel is in harbour or vehicle in home town because it is reducing the number of position reports and consequently also the cost.

4.1.11 Disable position report infos.

If this entry is set to **Yes** the transceiver will not display any INFO messages related to VMS position reporting. It is recommended that this entry is configured to **Yes** if information regarding VMS should be kept hidden from the operator.

The feature is configured by entering 28 in the fishery command entry.

4.1.12 Password on da-command

If this entry is set to **Yes** then the transceiver terminal command "DATA" is password protected i.e. prohibiting the operator from sending data reports using an external Message Terminal (including the TT-3606E Message Terminal DNID menu).

The "DATA" terminal command is used to transmit data reports.

```
┌──────────────────────────────────────────────────────────────┐
│  East-Atlantic            │ Capsat │  GPS ▐▌·   INM-C ▐▌▐▌▐▌   9:07 │
│                                                                │
│  File  Edit  Transmit  Logs  Distress  Position  Options  Applications │
│                                            Sc┌── Configuration ──┐│
│  ┌────────────────────────┬─────┬──────┐                        │
│  │                        │ DNID │      │                 rt... ││
│  │  Enable  Disable  Transmit                              ..   ││
│  │                                                              ││
│  │  Provider      ┌──File as datareport...───────┐             ││
│  │                │  Text in Editor as datareport │             ││
│  │                └──────────────────────────────┘             ││
│  │                                                       ...    ││
│  │                                                              ││
│  └──────────────────────────────────────────────┘──«▐────────  │
│  ASCII:            1 Chars    Line   1 Col  1       Inserting   │
└──────────────────────────────────────────────────────────────┘
```
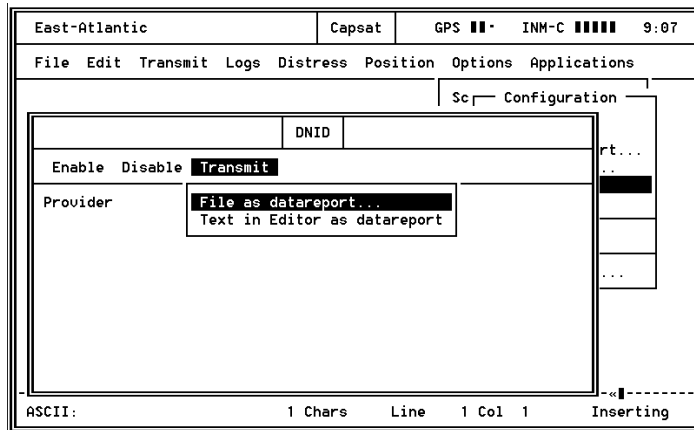
It is recommended that this entry is set to **No** if the Hide remote connections entry (section 4.1.18) is set to **Yes**.

If the Hide remote connections entry is set to **No** then this entry could be set to **Yes** because then only VMS DNIDs are hidden from the operator.

Additional DNIDs downloaded by other authorities are shown to the operator and therefore a protection of these DNID can be accomplished by removing the possibility of sending data report to these DNIDs.

The feature is configured by entering 29 in the fishery command entry.

4.1.13 Only 1 packet per position report

If this entry is set to **Yes** the transceiver will only send 1 packet position reports i.e. no speed, course or extended information is transmitted. The fields described in Figure 5 Second Part of Position Report are not send and this reduces the number of position reports transmitted from the vessel/vehicle by 50% and consequently reduces the price of the position report.

The entry can also be controlled remotely via the satellite link i.e. it is possible using special T&T poll to change the content of the position reports. Please see section 5 Remote configuration of the transceiver via poll**.**

The feature is configured by entering 31 in the fishery command entry.

4.1.14 Mask out speed and course

If this entry is set to **Yes** the transceiver will mask out speed and course information from the data report. These fields will be set to 511 and 255. There is no reducing in size/cost of the position report.

This entry can also be configured remotely. This feature is only useful where local regulations prohibits the authorities from getting this information from the vessel/vehicle.

The feature is configured by entering 32 in the fishery command entry.

4.1.15 Disable GPS first fix beep

If this entry is set to **Yes** the transceiver will not indicate to the operator when the GPS has calculated a position. Usually when the transceiver gets the first position from the GPS after power-up the transceiver beeps twice to indicate that the GPS is working. In the Fishery transceiver this beep also indicates that the unit is transmitting the power-up position report that might should be hidden from the operator.

It is recommended that this entry is set to **No** to ease remote diagnostics in case of equipment problems.

The feature is configured by entering 33 in the fishery command entry.

4.1.16 'A' in provider downloads VMS DNID

If this entry is set to **Yes** it is possible to download the VMS DNID, LES pair as described in section 4.1.25 VMS DNID and VMS LES via normal Inmarsat-C download DNID poll. The last character in the provider name field (character # 25) of the download DNID poll must be an 'A'.

If this entry is set to **No** then the VMS DNID entry cannot be changed remotely. However if the DNID used by the fishery authorities or vehicle fleet owner are fixed for each ocean region there is no need for this option.

It is recommended that this feature is configured to **NO**.

The feature is configured by entering 34 in the fishery command entry.

4.1.17 Use VMS DNID for special reports

If this entry is set to **Yes** then

Only the account on the LES for the (DNID, LES) pair described in 4.1.25 VMS DNID and 4.1.25 VMS LES will receive the special position reports transmitted by the transceiver.

This setting is recommended because it allows global coverage using 4 VMS DNID, LES pairs.

The special reports are all types of position reports except interval position report i.e.:

- *Normal Position Report after Antenna Blockage/ Disconnection*

- *Power Up Report*

- *Power Down Report*

- *Antenna Disconnection Report*

- *Antenna Blockage Report*

- *Manual Position Report*

- *Stored Position Report*

Interval position reports to VMS DNID, LES pairs can be done by using normal Inmarsat program PU poll.

If this entry is set to **No** then

All DNIDs used in remote configured Inmarsat PU interval program will receive the special position reports transmitted by the

transceiver. This setting is not recommended due to the fact that remote configured Inmarsat PU interval program can only be set-up for one ocean region at a time.

The special reports are all position reports i.e.:

- *Normal Position Report*

- *Power Up Report*

- *Power Down Report*

- *Antenna Disconnection Report*

- *Antenna Blockage Report*

- *Manual Position Report*

Please notice that automatically storing of position in the trans-ceiver when outside Inmarsat coverage is not supported if this entry is **No**.

The feature is configured by entering 35 in the fishery command entry.

4.1.18 Hide remote connections

If more than one VMS interval connection is required because other authorities would like to survey the vessel/vehicle this entry should be set to **Yes**. Setting this entry to **Yes** will make the transceiver hide all remote connections - Inmarsat PU interval connection – from the operator so that only local configured PU connection will be displayed. DNID´s that are part of a remote programmed PU are also hidden from the operator.

It is generally not recommended to have more VMS interval connections as this will double the costs for positioning reports. Alternatively a land based distribution should be used.

The feature is configured by entering 36 in the fishery command entry.

4.1.19 Keep inactive connections

When a connection has no DNID in the ocean region where the transceiver is logged in, the connection is inactive. Inactive connections are normally removed, but setting this option to yes will prevent the removal.

The feature is configured by entering 37 in the fishery command entry.

4.1.20 MEM Code translation table

This entry is used to define the MEM codes used in each transmitted position report. There is no restriction on what value that is assigned to a Macro Encoded Message but please note that Inmarsat has predefined some Messages for Land Mobile Use in the range 01H-3FH.

The default value for each Macro Encode Message is listed in Table 3.

No	Macro Encode Message	Value
1	Normal Position Report	0BH
2	Power Up Report	40H
3	Power Down Report	42H
4	Antenna Disconnection Report	44H
5	Antenna Blockage Report	45H
6	Enter Sleep Mode Report	50H
7	In Sleep Mode Report	51H
8	Leave Sleep Mode Report	52H
9	Fix Time Begin Report	53H
10	Enter Reduced Transmission Mode Report	55H
11	In Reduced Transmission Mode Report	56H
12	Leave Reduced Transmission Mode Report	57H
13	Manual Position Report	58H
14	Stored Position Report	46H
15	I/O Status Report	47H

Table 3 Default Macro Encoded Messages

Please notice that Macro Encode Messages 6 + 7 + 8 and 9 are unavailable in the TT-3020C/TT-3028CM SOLAS Fishery Trans-ceivers due to the fact that Sleep Mode not is implemented in the SOLAS Transceivers. I/O Status Report (15) is only available in the TT-3022C landmobile transceivers.

The feature is configured by entering 40 in the fishery command entry.

4.1.21 Number of positions in storage queue

The transceiver can store up to 100 positions at regular interval when outside Inmarsat coverage. This entry defines the maximum numbers of position that should be stored and later transmitted to the VMS. The storage queue is a circular buffer i.e. the oldest position is deleted when the buffer is full.

When the Inmarsat-C signal is blocked for approximately 11½ minutes (80 Inmarsat TDM frames) and the GPS signal is still present the transceiver will go into a mode where it stores positions in non-volatile memory.

At the same time the transceiver will start to give an audio alarm to indicate to the operator that it is time for manual scanning of NCS's due to high bulletin board error level.

When Inmarsat signal becomes OK again and has been OK for approximately 3½ minutes i.e. the level where the audio alarm stops because the transceiver has synchronised to a satellite, the stored positions are transmitted to the VMS DNID, LES pair. One position report at a time spaced 3 minutes from the completion of the previous stored position transmission. This ensures 3 minutes of NCS TDM listening between every report which will allow EGC reception like safety calls or weather forecasts.

The interval used for storage of positions in non-volatile memory is the short interval specified in the fishery configuration (see section 4.1.23 Reporting intervals). The first position stored is spaced this short interval from the time of signal lost e.g. if short interval is 2 hours the first position is stored 2 hours after the Inmarsat signal is lost. The position and the time when the Inmarsat signal is lost is transmitted in an Antenna Blocked position report.

The feature is configured by entering 51 in the fishery command entry.

4.1.22 Position report packet 2 - bit mask

The idea of this entry is to allowed a Message Terminal or data terminal (only TT-3022D) to set some bits in the position report packets.

This entry in the Fishery Configuration is used to select the bits in the position report packet number 2 that can subsequently be changed by the Message Terminal/data terminal software.

If these bits are unused it is recommended that the default values of this entry are kept unchanged.

This bit mask is used to enable/mask bits in the "PG –B" buffer. The bit mask is used in position report in the following way:

bytes6to13_ of_pack_2 =
bytes6to13_of_pack_2 **OR** ("PG –B" buffer **AND** "FI" bit mask)

The bit mask is entered in hexadecimal numbers.

Bytes6to13_of_pack2 is the same as byte 34 to 41 in the DNID file with API Header (please see section 2.1.1).

This entry is only of interest if the Message Terminal/data terminal connected to the Transceiver supports the possibility of altering the specific bits in the positioning report. Currently the TT-3606E Message Terminal does not support this option.

A Message Terminal used for the TT-3020C/TT-3028CM SOLAS Fishery Transceiver must be approved by Inmarsat and therefore only very few Message Terminals are suited to fit this transceiver. The TT-3022D Fishery Transceiver can however have various Message Terminals/data terminals connected and a Message Terminal for the Non SOLAS Transceiver must not be approved by Inmarsat. It is therefore possible to develop customer designed data terminals that supports the "Position report packet 2 – bit mask" feature.

The feature is configured by entering 50 in the fishery command entry.

4.1.23 Reporting intervals

In this entry the different reporting intervals must be configured. The reporting interval thresholds are entered in minutes but the actual Inmarsat TDM frame numbers are also shown in brackets.

The reporting intervals configuration are used together with the following items: Long to short report interval change (please see section 4.1.7), Set transceiver In-Port mode (please see section 4.1.10.2) and in Number of positions in storage queue (please see section 4.1.21).

The fields are configured by entering 60 in the fishery command entry.

4.1.24 Reporting interval change distance

This entry specifies the distance that the vessel/vehicle must move before the reporting interval of the VMS position report is changed from long to short reporting interval.

The different reporting intervals are used as described in section 4.1.7 Long to short report interval change is changed and the different reporting intervals are configured as described in section 4.1.24 Reporting interval change distance.

The field is configured by entering 61 in the fishery command entry.

4.1.25 VMS DNID and VMS LES

This entry is used to specify which DNIDs in the DNID list that are VMS DNIDs. Polls to the transceiver that changes the configuration of the transceiver will only be accepted by the transceiver if the polled DNID is in this VMS DNID list.

If the entry "Use VMS DNID for special reports" (page 4-16) is configured to **Yes** then as soon as a match is found between this configuration and the DNID list the transceiver starts sending special reports to the VMS DNID. A DNID list can be listed by entering "STATUS –D" in the Transceiver terminal.

DNIDs for all four oceans can be configured and it is important to configure all ocean regions before shipping the equipment.

The VMS DNID and VMS LES entry can not be configured remotely unless the fishery configuration "A' in provider downloads VMS DNID" (page 4-15) is set to **Yes** but it is recommended that fixed VMS DNID, LES pairs are used and that the fishery configuration entry "A' in provider downloads VMS DNID" is configured to **No**.

Note that It is not possible to change these entries manually when the 'A' in provider downloads VMS DNID" is set to yes. These entries are updated automatically when download DNID via the LES.

These fields are configured by entering 70 or 71 in the fishery command entry.

4.1.26 Number of active DNID in transceiver

This entry is used to specify how many of the DNIDs in the DNID list that are allowed to be active as positioning reporting DNIDs.

Up to 25 DNIDs can be downloaded but the number of active DNID can be limited using this command. Only active DNID can be used for position reporting. This entry can be used to limit the access to local configured position reporting.

It is however not recommended that the default value of 25 is changed because it reduces the functionality of the system when used by an operator on a fishing vessel or truck.

The idea of this feature is to limit the number of DNIDs that can be downloaded in the equipment. This is implemented by disabling all DNIDs that are downloaded after the number of allowed DNIDs are used. Changing this entry does NOT enable any already downloaded DNIDs.

The field is configured by entering 72 in the fishery command entry.

Password protection

Password protection of the fishery configuration is a vital part of the preparation of a Fishery Transceiver. Without password protection

it is possible for anyone to change the behaviour of the transceiver. The transceiver allows passwords up to 8 characters.

The terminal command "SET -D N" is used to enter a new pas s-word.

When password protection is applied some features cannot be accessed more unless the password is known. In Table 4 is listed the transceiver terminal commands that are prohibited from being used when password protection is applied to the Fishery trans-ceiver.

Terminal Command Description	Terminal Command	Password protected when:
Fishery configuration	FI	always
Data report	DA	FI 29 = Yes
Logout	LO	always
Message Data Report	RS	always
Go to NCS	NC -G	always
Terminal baud rate setup	SE -C	always
Change into EGC only	SE -E	always
Initialise system parameters	SE -B	always
Set antenna voltage	SE -F	always
Reduced transmission mode	SE -H	always
Sleep mode	SL	always
Performance Verification Test	TE	FI 35 = No
Change Mobile ID number	SE -U	FI 35 = No
Open a local connection	PG -O	FI 35 = No
Close a local connection	PG -C	FI 35 = No
Program a local connection	PG -P	FI 35 = No
Initiate interval reporting on a local connection	PG -I	FI 35 = No
Stop interval reporting on a local connection	PG -S	FI 35 = No
Display a local connection	PG -D	FI 35 = No
Login (TT-3022D)	LI	always
Scan (TT-3022D)	NC -S	always
Login (TT-3020C/TT-3028CM)	LI	Never protected
Scan (TT-3020C/TT-3028CM)	NC -S	Never protected
Zone	ZO	Always

Table 4 Password Protected Commands

4.3   Automatic ocean region shift

Please notice that this command is not supported in the TT-3020C SOLAS Fishery Transceiver nor in the TT-3028CM Dual Mode SOLAS Fishery transceiver.

The transceiver can be configured to perform automatic ocean region shift depending on either position or signal strength. This configuration is very useful when the vessel/vehicle operates in different ocean regions.

The configuration is done by setting the environment variable OCEANSHIFT to either YES or SIGNAL.

`se -z OCEANSHIFT=YES`

- The Transceiver will make an automatic login to a new NCS if the GPS position of the Transceiver has changed to make another ocean area a better choice.

The environment variable OCEANSHIFT=SIGNAL

`se -z OCEANSHIFT=SIGNAL`

- The Transceiver will make an automatic login to the best NCS if the Inmarsat-C signal has been bad for a few minutes.

Reduced transmission mode

The transceiver can be configured to run in reduced mode where the number of transmitted position reports are limited - and consequently the airtime costs are reduced. By using the reduced transmission mode this can be accomplished without reducing the efficiency of the surveillance.

The transceiver can be configured to two different reduced transmission modes as illustrated in Figure 15:

- Reduced Mode 1 normally just called Reduced Mode and

- Reduced Mode 2 also known as Advanced Reduced Mode.

The configuration of the mode is done using the following transceiver terminal command "SE -H".

- "SE -H 1" configures the transceiver to Reduced Mode 1.

- SE -H 2" configures the transceiver to Reduced Mode 2.

- "SE -H 0" disables reduced mode and

- "SE -H" show current status.

Reduced
mode

• If the transceiver has sent 2 interval position reports with positions within a radius as specified in "FI 61 - Reporting interval change distance", further scheduled interval position reports will not be transmitted as long as the current position is still inside the radius.

Mode 1

• Interval position reports are transmitted with MEM code "Normal Position Report"

Mode 2

• Interval position reports are transmitted with MEM code "In Reduced Transmission Mode Report"
• When entering/leaving Mode 2 - using terminal command "SE -H" or remote configuration poll - the transceiver transmits "Enter Reduced Transmission Mode Report"/"Leave Reduced Transmission Mode Report"
• Sleepmode interval wakeup position reports are only transmitted if the current position is outside the radius as specified in "FI 61 - Reporting interval change distance" of the position in the last transmitted position report.
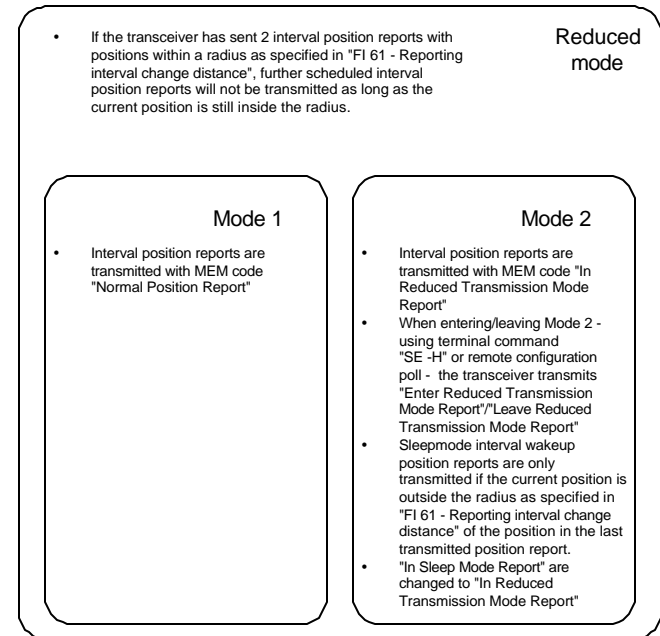• "In Sleep Mode Report" are changed to "In Reduced Transmission Mode Report"

Figure 15 Reduced Transmission Mode

Please note that the sleep mode functionality in mode 2 of "Reduced transmission mode" cannot be used in the TT-3020C/TT-3028CM SOLAS Fishery Transceiver.

The following example illustrates the used of reduced mode.

A fishery vessel that sails at sea or a vehicle on the road returns its position, speed and course at regular intervals. The positions from a vessel/vehicle shown in Figure 17 indicates that the ves-sel/vehicle has moved as shown in Figure 18.
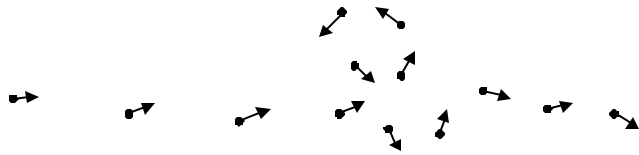
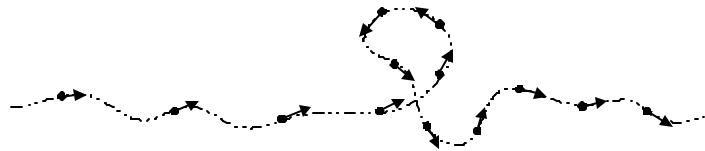Figure 17 Position, speed and course shown graphically

Figure 18 Vessel/Vehicle track

Using reduced transmission mode will reduce the number of p osi-tion, speed and course reports returned by the vessel/vehicle. Figure 19 shows the position reports transmitted by the same ves-sel/vehicle used in Figure 17 but with reduced transmission mode enabled.
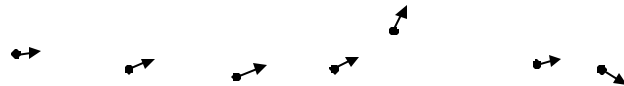
Figure 19 Reports from MES in reduced mode

The number of position report is reduced because the ves-sel/vehicle at the time of interval reporting checks whether or not it is still inside the radius of reduced mode as configured in the fis h-ery configuration entry "Reporting interval change distance" (please see page 4-22).

Figure 20 shows the radius and the position reports that are not transmitted because the position is inside the radius defined for reduced transmission mode.
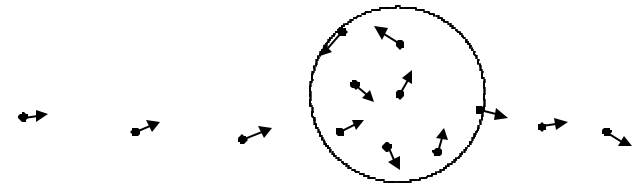

Figure 20 Radius used to check for reduced transmission

4.5   Sleep mode

Please notice that this command is not supported in the TT-3020C SOLAS Fishery Transceiver nor in the TT-3028CM Dual Mode SOLAS Fishery transceiver.

When the transceiver is turned OFF/ON using the remote power supply pin in DC connector X1 - Remote Switch - then the trans-ceiver can be used in configurations where automatically power up at regular intervals is preferred even in periods where the trans-ceiver is turned "OFF". This feature is used where interval reporting is wanted but battery power is limited.

The transceiver needs to be configured for this operation otherwise the remote power supply pin in DC connector X1 - Remote Switch - will have the same functionality as the ON/OFF button S1 - Main

Power Switch - namely abruptly removing the power supply from the transceiver.

No matter the configuration the ON/OFF button S1 - Main Power Switch - on the rear panel of the transceiver will always have same effect as cutting the main power supply i.e. a power loss situation.

4.5.1   Setting up Sleep mode operation

Purpose: Control sleep mode operation.

Format: SLeep <options>

Option	Description	Detail
-d	Show sleep mode status.	
-i <T1>, <HH>, <MM>, <T2>	Set-up sleep mode operation.	Where: T1: 0 - 24, Duration in hours the transceiver sleeps between wake ups. If T1=0, then there are no periodic wake ups defined. HH: 0 – 23 MM: 0 - 59, HH:MM specifies the time (UTC) for Fix Time wake up. T2: 15 - 60, Duration in minutes of Fix Time wake up. The Transceiver will always use a minimum Fix Time wake up of 15 minutes.
-c	Disables sleep mode operation.	
-m <M>	This switch control the behaviour of the transceiver in case of main power failure or the master power switch is switched OFF at the time of a wake up.	M = 0: The Transceiver will not wake up until next day exactly 24 hours later if the main power has been restored at that time. Otherwise the wake up will be postponed for further 24 hours. M = 1: The Transceiver will wake up 1 hour later if the main power has been restored at that time. Otherwise the wake up will be postponed for further 1 hour. This mode consumes a little bit more power as the transceiver shortly wakes up every hour just to check if powering up is possible.

Table 5 Sleep Mode Command

- Transceiver will NOT go to sleep immediately after setting Remote Switch OFF. The transceiver will first go to sleep when

it has prepared the next wakeup time and this can easily take up to 1 minute if the transceiver is not engaged in other traffic.

- Transceiver will wake up 1 minute after going to sleep and transmit an "Enter Sleep Mode Report". (In software version V3.20 this was 2 minutes).

- If the transceiver is powered up during this 1 minute sleep (Remote Switch set ON again) NO reports are transmitted.

- There is a critical period of 10sec after wakeup. If the Main Power fails during these 10 sec the transceiver will "sleep" for 24 hours. This critical period only applies to the interval wake-ups during sleep and not the "Enter Sleep Mode Report" wake up.

- "Power Down "/"Power Up " reports are transmitted in pairs but if this occurs after "Enter Sleep Mode Report" the transceiver will in addition to the power fail reports transmit a "Leave Sleep Mode Report". When the transceiver goes to sleep again (because Remote Switch is still OFF) a new "Enter Sleep Mode Report" will be transmitted.

4.6   Surveillance zones

A surveillance zone is a geographical area, with a reporting interval to be used when the vessel/vehicle is within the area. The zones can be used to reduce or increase the number of transmitted position reports depending on, where the vessel/vehicle is. The surveillance zone only affects the reporting interval of the VMS connection, and can therefor only be used in "fishery" and "landmobile" transceiver types. The surveillance zones are configured using a terminal program, or remotely using Inmarsat poll (VMS DNID). Before the zones can be programmed a valid configuration password must be entered.

7 types of zones with different shapes are defined

| Zone type	Shape	Limits
1	Circle	Min radius 1 km Max radius 65535 km (40000 km)
2	Polygon with 3 positions	Max angle between sides = 180°
3	Polygon with 4 positions	Max angle between sides = 180°
4	Polygon with 5 positions	Max angle between sides = 180°
5	Polygon with 6 positions	Max angle between sides = 180°
6	Polygon with 7 positions	Max angle between sides = 180°
7	Polygon with 8 positions	Max angle between sides = 180°

Table 6 Possible zone shapes
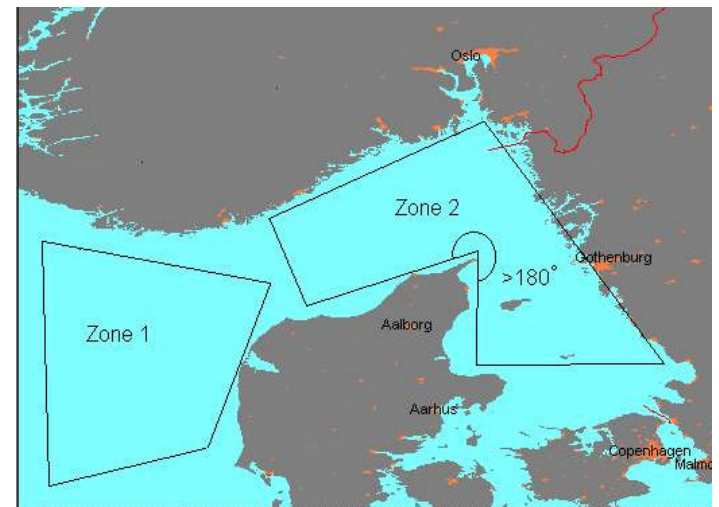
Figure 21 Zone example

Examples of zones: Zone 1 is a valid type 3 zone, Zone 2 is invalid because of the angle above 180°

If an invalid shape or invalid data is programmed the entire zone is ignored. When zones overlap the zone with the highest priority (lowest number) will determine the reporting interval.

4.6.1   Setting up surveillance zones

Purpose: Control surveillance zones.

Format : ZOne <options>

The zone has to be created using zone -n before the interval and positions can be entered.

Note:. The Number of positions in storage queue in fishery menu item 51 (please see section 4.1.21) must be less than 100 when using surveillance zones ..

Options
-d ["zonenumber"]
   Displays the zone configuration. Use "zonenumber" to select a specific zone.

-i "zonenumber","reporting interval"
   Add/Change the reporting interval in a zone

        "reporting interval" = "20" - "65535"

-n "zonenumber","zonetype"
   Create a new zone.

Zonetype	Zonetypes
1 -	Circle
2 -	Triangle
3 -	Quadrille
4 -	Pentagon
5 -	Hexagon
6 -	Heptagon

7 -	Octagon

-o "zonenumber","radius"
  Add/Change the zone radius.

"**radius**" = "1" - "65535"

-p "zonenumber","positionnumber"," lat deg","lat min","lat dsec","hemNS","lon deg","lon min","lon dsec","hemEW"
  Add/Change a position in a zone.

"positionnumber" = "1" - "8"
"lat de g" = "0" - "90"
"lat min" = "0" - "59"
"lat dsec" = "0" - "99"
"hemNS" = "n"|"N"|"s"|"S"
"lon deg" = "0" - "180"
"lon min" = "0" - "59"
"lon dsec" = "0" - "99"
"hemEW" = "e"|"E"|"w"|"W"

-r "zonenumber"
  Remove a zone.

Common parameters
  "zonenumber" = "1" - "255"

5   Remote   configuration   of the transceiver via poll

5.1   VMS Configuration

The following poll to sub-address 1 is defined by T&T:

Poll command number	Command name	Meaning
6CH (108)	T&T Remote configuration	This poll is used to configure the transceiver remotely

Table 7 T&T Remote Configuration

The Inmarsat defined individual poll format is:

[Individual] ::= [MES ID][LESID][Subadr][DNID][Resp][Spare] [Poll Ack][Command Type][Seqno][Datapart]

The individual T&T remote configuration poll has the following for-mat:

Poll Ack (1 bit)

If this bit is set the transceiver will send a acknowledgement Data Report acknowledging the receipt of the Poll

Command Type (7 bit)

Value 6CH

Datapart

[Data Part] ::= [Zero field][Command array]

Zero field (1 byte)

Value 00H.

Command array

[Command array] ::= [Packet Descriptor[1]][AckRef [1]][Type dependent fields[1]] [Checksum[1]]...[Packet Descriptor[27]] [AckRef [27]][Type dependent fields[27]][Checksum[27]]

Packet Descriptor

The packet descriptor field has the same format as the Inmarsat packet descriptor, short and medium packet descriptor are supported.

[Packet Descriptor] ::= [Short Packet Descriptor]

or

[Packet Descriptor] ::= [Medium Packet Descriptor]

Short Packet Descriptor

[Short Packet Descriptor] ::= [Short][Type][Length]

Short (1 bit)

Value 0

Type (3 bit)

This field contains the command type that must be executed in the transceiver. Please refer to 0

Length (4 bit)

Number of bytes from the end of the [Length] field that is a part of this command.

Medium Packet Descriptor

[Medium Packet Descriptor] ::= [Medium][Type][Length]

Medium (2 bit)

Value 2 (10 binary)

Type (6 bit)

This field contains the command type that must be executed in the transceiver. Please refer to 0

Length (8 bit)

Number of bytes from the end of the [Length] field that is a part of this command.

Type

The table below shows command types supported.

Type	Meaning
00	Fishery Configuration
01	Zone Configuration

Table 8 T&T Poll Command List

AckRef

[AckRef] ::= [Spare][Command No]

Spare (3 bit)

Value 0

Command No (5 bit)

Current command reference number. Each command in this configuration poll must have a unique number. This number is used in the acknowledgement poll to acknowledge the individual commands in the configuration poll. A maximum of 27 configuration commands can be transmitted in one poll. Value 00H is reserved and must not be used.

Checksum (16 bit)

The [AckRef] and [Type dependent fields] are included in check-sum calculation. Checksum is calculated in the following way (same way as the checksum for normal Inmarsat packets).:
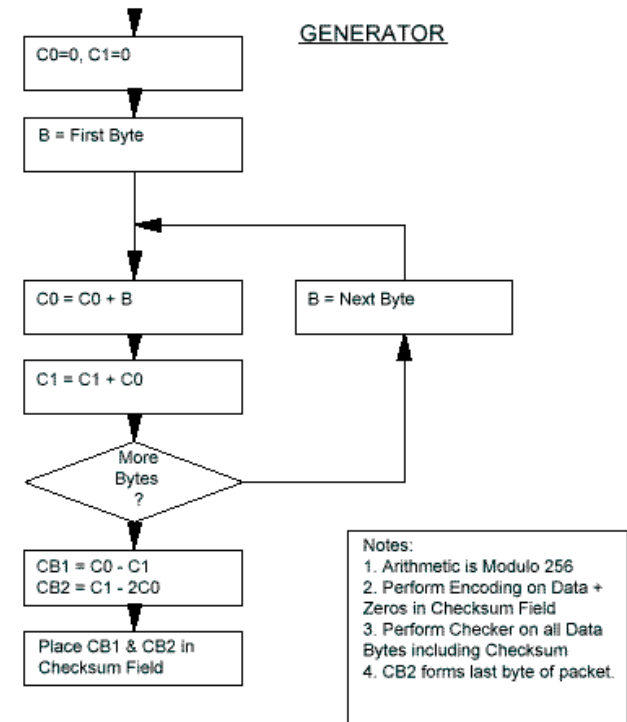
GENERATOR

C0=0, C1=0

B = First Byte

C0 = C0 + B   B = Next Byte

C1 = C1 + C0

More Bytes ?

CB1 = C0 - C1
CB2 = C1 - 2C0

Place CB1 & CB2 in Checksum Field

Notes:
1. Arithmetic is Modulo 256
2. Perform Encoding on Data + Zeros in Checksum Field
3. Perform Checker on all Data Bytes including Checksum
4. CB2 forms last byte of packet.

Figure 22 Poll Command Checksum Calculation

5.2 Fishery Configuration (FI command) Poll

Type dependent fields

[Type dependent fields] ::= [Entry No][Parameters]

Entry No (1 byte)

First parameter of the FI command. This is the entry of FI configuration what is normally entered in "*Enter field number* >".

Parameters

The parameters field depends on the entry number.

Entry	Description	Parameter(s)	
10	Date and time format	Value: 0,1,2 or 3	Size: 1 byte
20	Antenna Blocked/Disconn followed by normal position report	Value: 0 or 1	Size: 1 byte
21	Retransmit fail reports	Value: 0 or 1	Size: 1 byte
22	Blocked GPS detection	Value: 0 or 1	Size: 1 byte
23	Long to short report interval change	Value: 0 or 1	Size: 1 byte
24	Nice power down support	Value: 0 or 1	Size: 1 byte
26	Disable Send LED on position report TX	Value: 0 or 1	Size: 1 byte
27	Stop button initiates position report	Value: 0, 1 or 2	Size: 1 byte
28	Disable position report infos.	Value: 0 or 1	Size: 1 byte
29	Password on da-command	Value: 0 or 1	Size: 1 byte
31	Only 1 packet per position report	Value: 0 or 1	Size: 1 byte
32	Mask out speed and course	Value: 0 or 1	Size: 1 byte
33	Disable GPS first fix beep	Value: 0 or 1	Size: 1 byte
35	Use VMS DNID for special reports	Value: 0 or 1	Size: 1 byte
36	Hide remote connections	Value: 0 or 1	Size: 1 byte
37	Keep inactive connections	Value: 0 or 1	Size: 1 byte
40	MEM Code translation table (HEX)	Value: 15 MEM code ranged from 00H to 7FH Size: 15 bytes (medium packet must be used)	
50	Position report packet 2 – bit mask (HEX)	Value: 8 mask values ranged from 00H to FFH Size: 8 bytes	
51	Number of positions in storage queue	Value: 0..100	Size: 1 byte

60	Reporting intervals (long, short in minutes)	Value: 2 intervals ranged from 1 to 9437. Each interval has the size of 2 bytes and must be specified with LSB followed by MSB. Size: 4 bytes
61	Reporting interval change distance (in decameters)	Value: A distance ranged from 15 to 65535. The distance has the size of 2 bytes and must be specified with LSB followed by MSB. Size: 2 bytes
72	Number of active DNID in transceiver	Value: 0..100 Size: 1 byte

Table 9 Connection between entry number and parameters.

5.3   Zone Configuration Poll

Type dependent fields

[Type dependent fields] ::= [Zone header][Zone data]

Zone header (4 bytes)

[Zone header] ::= [Zone No][Zone type][Zone reporting interval]

Zone No (1 byte)

Value 0..255

Zone type (1 byte)

Value 0..7

Zone reporting interval (2 bytes)

Value 20..65535 (frames) (LSB, MSB)

Zone data depends on the zone type.

Zone type	Description	Zone data
0	No zone	<No zone data>
1	Circle	[Pos][Radius]
2	Polygon with 3 sides	[Pos$_1$] [Pos$_2$] [Pos$_3$]
3	Polygon with 4 sides	[Pos$_1$] [Pos$_2$] [Pos$_3$] [Pos$_4$]
4	Polygon with 5 sides	[Pos$_1$] [Pos$_2$] [Pos$_3$] [Pos$_4$] [Pos$_5$]
5	Polygon with 6 sides	[Pos$_1$] [Pos$_2$] [Pos$_3$] [Pos$_4$] [Pos$_5$] [Pos$_6$]
6	Polygon with 7 sides	[Pos$_1$] [Pos$_2$] [Pos$_3$] [Pos$_4$] [Pos$_5$] [Pos$_6$] [Pos$_7$]
7	Polygon with 8 sides	[Pos$_1$] [Pos$_2$] [Pos$_3$] [Pos$_4$] [Pos$_5$] [Pos$_6$] [Pos$_7$] [Pos$_8$]

Table 10 Connection between Zone type and Zone data

Radius (2 bytes)

Value 1..65535 km (LSB, MSB)

Pos (40 bit)

[Pos] ::= [Latitude][Longitude][Spare]

Latitude (19 bit)

[Latitude] ::= [Hemisphere][Degrees][Minutes][Fractional part]

Hemisphere (1 bit)

A North/South flag. Set to 0 for North or 1 for South.

Degrees (7 bit)

The degrees of Latitude, North or South.

Minutes (6 bit)

The integer part of the Minutes of latitude.

Fractional part (5 bit)

The fractional part of the Minutes of latitude in units of 0.04 of a Minute.

Longitude (20)

[Longitude] ::= [Hemisphere][Degrees] [Minutes][Fractional part]

Hemisphere (1 bit)

An East/West flag. Set to 0 for East or 1 for West.

Degrees (8 bit)

The degrees of Longitude, East or West.

Minutes (6 bits)

The integer part of the Minutes of longitude.

Fractional part (5 bits)

The fractional part of the Minutes of longitude in units of 0.04 of a Minute.

Spare (1 bit)

Spare bit set to zero

5.4   VMS Set-up Acknowledgement

When the transceiver has received the T&T Remote Configuration poll and if acknowledgement is requested the transceiver returns a acknowledgement data report with partly specific packet content as defined by Inmarsat.

[Acknowledgement data report] ::= [P][C][Type][DNID][LES ID]
[Member no][Category][Sub-Category][Command][Seqno][Spare][Data]

Type (6 bit)

Value 04H

Category (2 bit)

Value 02H

Sub-Category (6 bit)

Value 00H

Command (1 byte)

Set to same value as the poll command being acknowledged. For
Remote configuration poll this field has the value 6CH. The most
significant bit in the command field is the acknowledgement bit
described in 0

Data

Extended acknowledgement of the outcome of the configuration
change is added to the acknowledgement data report in the [Data]
field.

[Data] ::= [Result code][Extended result field]

Result code (16 bit)

The result code today ranges from 00H - 81H including results like:

VMS Set-up Acknowledgement   Remote configuration of the transceiver via poll

Result code	Description
0000H	No description of the outcome of the poll is included
0004H	Missing poll data

A new result code 6C is added

Result code	Description
006CH	Remote configuration acknowledge-ment is found in Extended result field

[Extended result field for remote configuration poll] ::=
[Result^1][Command No ^{1}]...[Result^{27}][Command No ^{27}]

Result (3 bit)

This is the result code of the configuration command.

Result code	Meaning	Applies to command type (see Table 8)
0	No error – configuration performed correctly	00 and 01
1	Unknown command	00 and 01
2	Invalid number of parameters	00 and 01
3	No access	00 and 01
4	Invalid polygon	01
5	Not enough memory	01
6	No free space	01
7	Unspecified error	00 and 01

Command No (5 bit)

This is the command number identifying the command in the configuration poll. Up to 27 (Result, Command No) pairs can be included in the response.

5.5   Fishery Set-up Poll Example

The following example shows poll illustrated in Figure 23 send from the LES using T&T PSTN/PSDN dialup interface. The .DATA prefix used to send binary data from the LES is NOT shown. Please refer the T&T document "TT-6000 Inmarsat-C Land Earth Station API-Header Description" for a detailed description of the LES interface.

Fishery Set-up Poll Example   Remote configuration of the transceiver via poll

Remote configuration poll
(Inmarsat packet descriptor and checksum not shown)

Remote configuration respons
(Inmarsat signalling packet descriptor and checksum not shown)

Packet 1

MES ID	
LES ID	
Sub adr (**01H**)	
DNID	
Resp.	Spare (**00H**)
Poll Ack	Command Type (**6CH**)
Sequence No.	
Zero field (**00H**)	
Short (**0**)	Type (FI=**00H**)	Length (FI 30 » **05H**)
Spare (**000**)	Command No (e.g. **05H**)
Entry No (FI 31 =**1FH**)	
Parameter1 (FI 31 YES =**01H**)	
Checksum (**4E8DH**)	
Short (**0**)	Type (FI=**00H**)	Length (FI 31 » **05H**)
Spare (**000**)	Command No (e.g. **06H**)
Entry No (FI 32 =**20H**)	
Parameter1 (FI 32 NO =**00H**)	
Checksum (**5288H**)	

DNID

LES ID	
Member no	
Cat. (**02H**)	Sub-Category (**00H**)
Command (**6CH**)	
Sequence No.	
Spare	
Result Code (FI result =**006CH**)	
Result (Ok =**0H**)	Command No (e.g. **05H**)

Packet 2

Result (Ok =**0H**)	Command No (e.g. **06H**)

Only 1 packet per pos report YES

Mask out speed and course NO

Figure 23 Example of Remote Poll Configuration

The poll illustrated in Figure 23 will set-up the transceiver fishery configuration entry 31 and 32.

```
31 : Only 1 packet per position report        : Yes
32 : Mask out speed and course                : No
```

> po -z 1 i 12345 n 1 491234567 108 0 0 0 1 ↵

[00] [05] [05] [1F] [01] [8D] [4E] [05] [06] [20] [00] [88] [52]

The value enclosed in brackets ([]) is the hexadecimal value of the byte send to the LES interface.

5.6   VMS connection for multiple ocean regions

The command type is 7CH. The poll must be addressed to sub-address 1.

The text field of the open connection poll contains the (LES id, DNID) pairs. A connection can contain only one (LES id, DNID) pair for each ocean region (max. 4).

Spare (8 bit) Number of LES, DNID pairs to be linked to this connection (8 bit)
LES id. #1 (8 bit)
DNID #1 (16 bit)
Member #1 (8 bit)
. . .

Figure 24 Open Connection Poll

The LES id is given in Inmarsat-C compressed format (The 2 MSB gives the ocean region and the 6 LSB the LES no).

The poll must be addressed to a DNID which is given in the list of DNID(s) and specified as VMS DNID in the fishery configuration.

Example:

```
poll 1 i 12345 n 1 491234567 124 67 <P8> <P9> 1 + followed by these bi-
nary data:
00h (Spare),
02h (No. of LES + DNID Pair),
5Fh (LES ID, East + 31),
39h, 30h (DNID No. 12345),
43h (Member No. 67)
DFh (LES ID, Indian + 31),
39h, 30h (DNID No. 12345),
43h (Member No. 67)
```

If the poll was successful the (LES id, DNID) pairs beside the DNID which is polled are added to the list of DNID(s) and to the VMS (LES id, DNID) pairs in the fishery configuration. The VMS con-

connection is modified to contain all (LES id, DNID) pairs included in the poll.

1 0 0 0 0 0 0 0
Command (8 bit)
Sequence Number (8 bit)
Spare (16 bit)
Result code = 1 (16 bit)
Checksum (8 bit)
Spare (8 bit)
Connection no. (8 bit)

CN = connection no.

Table 11 Positive Open Connection acknowledgement

The value of the checksum field is adjusted so a modulus 256 sum from and including the result code field is zero.

For all other Result codes the acknowledge report of Open Connection will be

1 0 0 0 0 0 0 0
Command (8 bit)
Sequence Number (8 bit)
Spare (16 bit)
Result code (16 bit)
Spare (8 bit)

Table 12 Negative Open Connection acknowledgement

5.7   Sleep mode Set-up Poll

The command type is 6AH. The poll must be addressed to sub-address 1. The purpose of this poll is to allow remote setting up of sleep mode.

T1 (8 bit)
HH (8 bit)
MM (8 bit)
T2 (8 bit)

Figure 25Sleep mode Set-up Poll

where:

T1:   0 - 24,

Duration in hours the transceiver sleeps between wake ups. If T1=0, then there are no periodic wake ups defined.

HH: 0 – 23

MM: 0 – 59

HH:MM specifies the time (UTC) for Fix Time wake up.

T2:   0 – 60

Duration in minutes of Fix Time wake up.

Setting T1=0 and T2=0 is equivalent to using the *sl -c* command.

Example of Sleep mode set-up poll:

poll 1 i 12345 n 1 491234567 106 67 <P8> <P9> 1

0Ch (T1, Wake up every 12 hour.)

0Fh (HH, Set to hour 15)

00h (MM, Set to minute 00)

30h (T2, Fix time wake up duration = 48 minutes)

The acknowledge report will be:

1 0 0 0 0 0 0 0
Command (8 bit)
Sequence Number (8 bit)
Spare (16 bit)
Result code (16 bit)

Figure 26 Sleep mode Acknowledge Report

5.8 Reduced transmission mode set-up poll

The command type is 6BH. The poll must be addressed to sub-address 1. The purpose of this poll is to allow remote setting up of reduced transmission mode.

Reduced Transmission Mode (8 bit)

Figure 27 Reduced Mode Set-up Poll

where:

Reduced Transmission Mode:

- 30H, equivalent to the *se - h 0* command.

- 31H, equivalent to the *se - h 1* command.

- 32H, equivalent to the *se - h 2* command.

Reduced transmission mode set-up poll   Remote configuration of the transceiver via poll

Example of Reduced transmission set-up poll:

poll 1 i 12345 n 1 491234567 107 67 <P8> <P9> **1+**

followed by one of three bytes:

30h   or

31h   or

32h.

The acknowledgement report will be:

1 0 0 0 0 0 0 0
Command (8 bit)
Sequence Number (8 bit)
Spare (16 bit)
Result code (16 bit)

Figure 28 Reduced Mode Acknowledge Report

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6   Development tips

This appendix includes some development tips in some cases not specific for a special type of fishery transceiver in other cases very specific for either the TT-3020C, the TT-3028CM or the TT-3022D Fishery transceiver.

- The password described in the document and entered into the transceiver using the "SE -D N" command must NOT be confused with the password found in Capsat Message Terminal program. These are 2 different passwords.

- Developer using the terminal command "DA -B" must be aware of the limitation in transmitting user defined reports. Using the "DA" command without "-o" - that specifies that this is a position report - will result in a "Bad Parameter(s)" error if the 2 significant bits of the first byte transmitted to the transceiver is binary 01B i.e. 01xxxxxxB - hex value 40H - 7FH.

  The reason is that without a position in the report the first byte send to the transceiver is byte 6 of the first packet in an Inmarsat data report. The 2 significant bits in byte 6 is the category field described in detail in section 2.1.

- A printer must always be attached to the transceiver otherwise the memory will be filled up with spool files of not printed messages and the transceiver will BEEP.

- In TT-3022D it is possible to switch printing off using the terminal command "SE -Z PRINTER=OFF"

- In TT-3022D it is possible to switch beeping off using the terminal command "SE -Z BEEP=OFF"

- Routing of received messages must be configured before installing the transceiver. Routing should be set to memory as it

is not allowed to install any of the Fishery Transceivers without a Message terminal.

- In TT-3022D setting up the routing to printer only and having terminal command "SE -Z PRINTER=OFF" will result in messages being receive but send directly to the garbage can. Please be aware of that the transceiver is billed for this message even though it was never seen as received.

- Setting up the EGC reception as appropriate.

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