Fleet77/55 Trouble Shooting Guide

Issue 1.00

Revision history

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Acronyms
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Symptoms:

Select the symptom below and then follow the link to possible diagnoses of the problem

General

ACU reset – 15 sec
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BDU On/Off switch (reset)
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Find latest SW
Relationship BDU -> Config Module -> ACU -> HPA
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Solved problems or partly solved problems
SW changes ACU

Handset Messages

FAQ

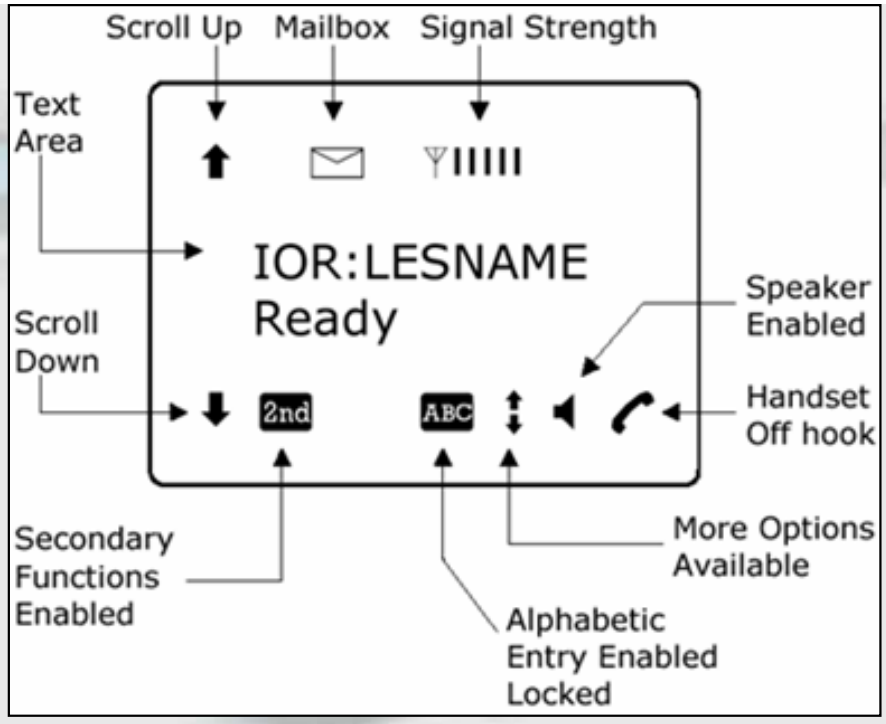
Tests and Adjustments

Handset LCD display

Scroll up:
More menu entries are to be found above. Press up-key.

Mailbox:
Short message is stored at a LES. By entering the menu, and scroll sown to Mailbox, the information of the LES access code and service type shown.

Signal strength:
The numbers of bars (maximum is 5) is indicating the signal level received from the global beam of the satellite by the antenna. The number of bars may fluctuate during a call. This is due to the power reduction negotiated between the Fleet77/55 and the LES.
The technical reference of signal strength should always be given in dBHz, read as C/No.



Scroll down:
More menu entries are to be found below. Press down-key.

Secondary function enabled:
Turned on when the 2nd-key has been pressed. This is indicating that the secondary function of the keypad is activated for functions and short-cuts.

Alphabetic entry enabled:
Turned on when the ABC-key is pressed, and the keypad is in alpha mode. In alpha mode the letters on the numeric keys are used (e.g. for name entries in the phone book).

More options available:
More information, such as values, actions or functions, in a menu point can be found by pressing the up- or down-keys.

Speaker enabled:
The external speaker in the Handset Cradle can be turned On and Off by pressing the 2nd- and 8-keys. The speaker-symbol is displayed when the external speaker is On.

Handset Off-hook:
Is shown whenever a call on the Handset is in progress, incoming as well as outgoing calls, by pressing the Off-hook/On-hook key or in case of incoming call by lifting the Handset from the cradle. The symbol is Off when the call is terminated.

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Handset LED definition

Below the Handset display, four LED are identifying the function and process of the system. The description for the LED, going left to right, are the following:

Power (green): When On, it indicates that the system is powered.

Alarm (red):	Will illuminate when the system detects or has detected a fault. A fault code will also be displayed in the LCD-display. The error message will only be shown in approx. 10-15 seconds. But in the Alarm Log the alarm and a short description of a remedy are shown.
Connection (yellow):	Will flash by an incoming call, when the system is ringing and will illuminate steadily when a phone/fax connection is made.
Sync (green):	Has a dual function. Initially, the LED will illuminate steadily when the system is in synchronization with a satellite. When the system has established a data-call, this LED assumes its secondary function as a data transfer light. When data is being transferred (sent or received) the LED will flash. This is a quick visual reference during data communications.

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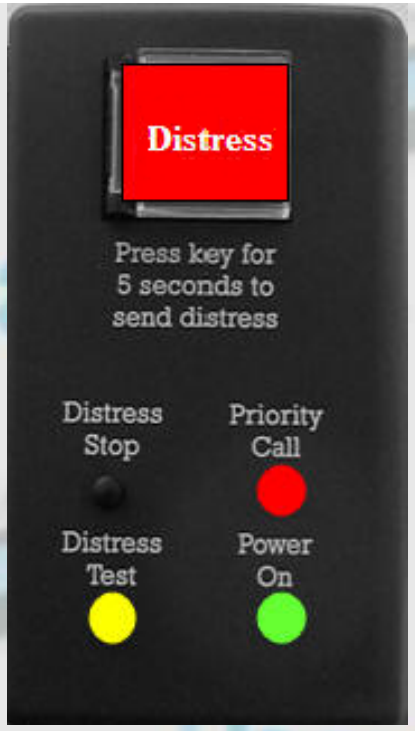
Handset Cradle LED definition (only available on the Fleet77)

On the Handset Cradle, four LED are identifying the function and process of the system. The description of the LED, going from top to bottom, is the following:

	Protected by plastic cover, is used to initiate a Distress call.
Distress button (red):	Press and hold, the button will start flashing with an interval of 1 second and the cradle buzzer will beep with the same interval. The Distress call will be canceled and the terminal will return to a normal state, if the button is released within 5 seconds.
Priority Call (red):	Is lit whenever a priority call is in progress. A priority call can be the Distress call (level 3) from the pushbutton above or an Urgency call (level 2) or a Safety call (level 1) from the handset.



Is lit when a distress test is being performed, see more how to perform the Distress Test.

Distress Test (yellow):

A Distress Test is made to test the Distress call system. When the Rescue Coordinating Center (RCC) receives the call, a flag in the message will be set, so that the RCC can identify the call as a test call, which do not need to be attended.

Power On (green): When On, it is indicating that the Fleet77 system is powered.

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Power Supply Module LED definition

The Power Supply Module (PSM) is provided +40 VDC from the BDU, and is providing power to the HPA. The description of the LED, going from top to bottom , are the following:

Processor (green): Is lit when +5 VDC to the HPA drivers and to the HPA processor is provided.

Cooler fan (green): Is lit when +5 VDC to the cooler fan of the HPA is provided. The power will only be provided by request from the HPA, when temperature internally is rising above threshold level at +36ºC and is cutting the power when the temperature is down at +32ºC.

Transmit (green): Is lit to indicate that the +28 VDC (16 - 28 VDC on HPA request, dependable of the service of transmission) is provided to the HPA as power for the amplification to transmit.

PSM On (yellow): Is lit to indicate that the +40 VDC from the BDU via the HPA is provided to the PSM.

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High Power Amplifier LED definition

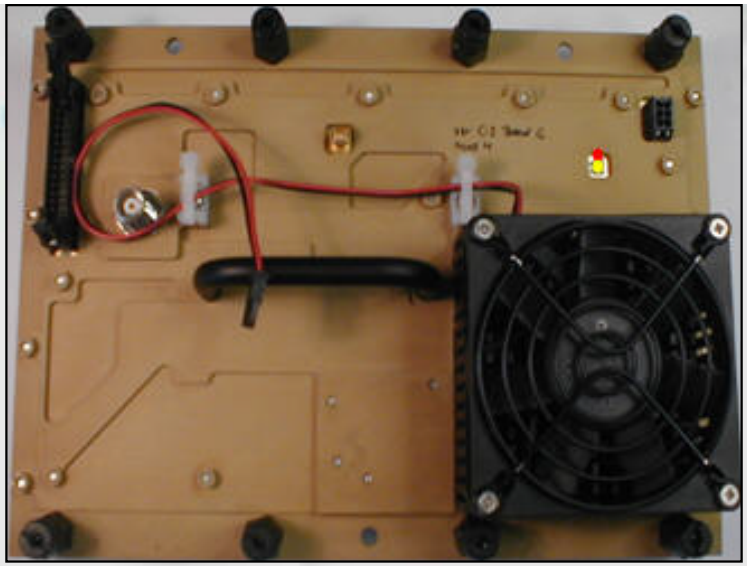
The High Power Amplifier (HPA) is provided +5 VDC to the drivers and the processor and +28 VDC for the amplifiers. The description for the LED, going from top to bottom, is the following:

Processor (red): Is flashing to indicate that the HPA-code is running (internal HPA software).

Transmit (yellow): Is on to indicate that the HPA is in transmitting mode. This, though, is not a clear evidence that the antenna actually is transmitting out of the antenna towards the satellite.

Bad or no communication:

If both LED are toggling (red On - yellow Off / red Off - yellow On), this is indicating that the communication between the BDU and HPA is bad or none existing.



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Antenna Control Unit LED definition

The Antenna Control Unit (ACU) is provided +40 VDC from the BDU. The +40 VDC will be transformed down to +5 VDC in the Power Supply Unit, internally in the ACU, which will be distributed for the circuits of the ACU. Accordingly the +5 VDC is distributed to the Hybrid & Squint Module, the DLNA, the RX2, the End Stop Switches, the AZSA and the SU. The description for the LED, going left to right, are the following:

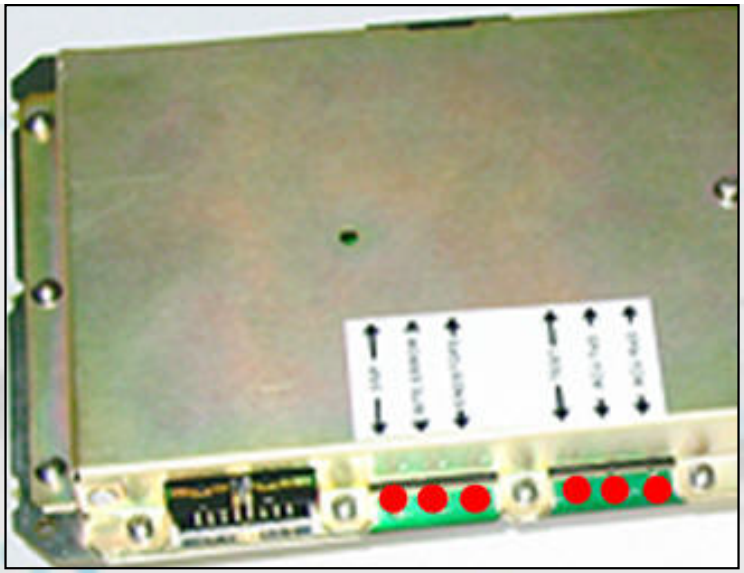
DSP (red):

Flashes with a fast flash rate when the Digital Signal Processor is running in normal mode. When the "Loader Program" is running, the LED is flashing in slow rate. In both cases, the ACU should response to BDU commands. The flashing is also indicating that the +40 VDC is provided to the ACU.

BITE ERROR (red):

The LED is On when the ACU has entered the "Error State" due to a BITE failure. If lit, the Antenna Diagnostic Program should be run, and the Warnings & Errors should be checked. Here further information is given regarding the more precise error message and the troubleshooting.

ENDSTOPS (red): The LED is On whenever one of the elevation end stop switches are activated. The end stop switches (NC-contact) is provided +5 VDC from the ACU. The ACU is also sensing the missing power when one of the switches are triggered.



TEST (red): The LED is driven by a pulse every second by the GPS. If the LED is not flashing, the GPS-engine may be defective. That will mean that the complete ACU have to be replaced, as the GPS is an integrated part of the ACU.

ACU TxD (red): Flashes every time a serial communication message is sent from the ACU to the BDU via the HPA. This is indicating that the ACU is responding to a valid message from the BDU:

ACU RxD (red): Flashes every time a serial communication message is received by the ACU. The ACU also receives the BDU messages intended for the HPA, but will not respond to these messages.

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Sensor Unit LED definition

The Sensor Unit (SU) is provided +5 VDC from the ACU via the SRA. The description for the LED, going top to bottom, are the following:

D1 (red): Flashes to indicate that the SU is powered and the processor is running.

D2 (red): Is flashing each time the SU is responding to a message from the ACU. This is indicating that the SU has received a valid command from the ACU. The LED will normally flash at a 5 Hz rate.

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Azimuth Zero Sensor Assembly LED definition

The Azimuth Zero Sensor Assembly (AZSA) is provided +5 VDC from the ACU. The power is delivered to the two Opto-encoders which will detect the pass of the Azimuth Zero Reference vane positioned at the antenna Mounting base in the bottom of the antenna dome. The use of two Opto-encoder is that also a direction (clock-wise or counter clock-wise) can be detected. The response of these Opto-encoders is sent back to the ACU. The description of the LED, going from top to bottom, is the following:

D2 (red): Normally On, but as the beam of the Opto-encoder is broken, the LED is going Off.

D1 (red): Normally On, but as the beam of the Opto-encoder is broken, the LED is going Off.

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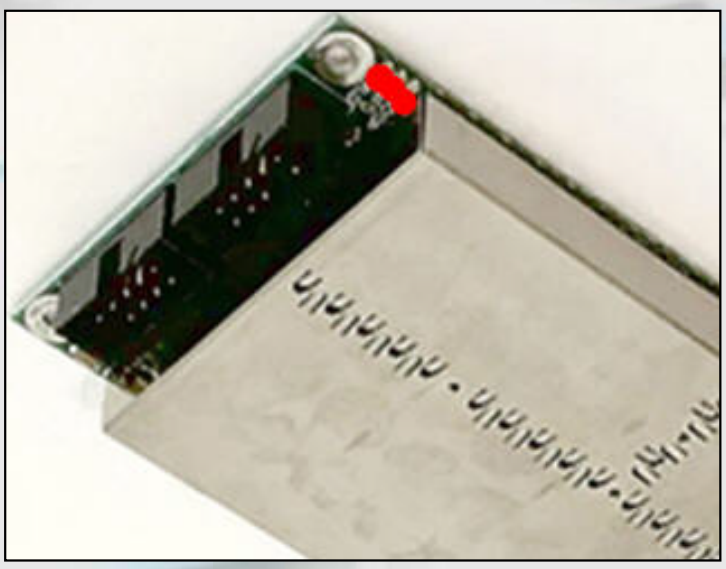
2nd Receiver LED definition

The 2nd Receiver (RX2) is provided +5 VDC from the ACU via the Hybrid & Squint Module. The description for the LED, going left to right, are the following:

LD (red):	Lock Detect - Is On when the RX2 is locked onto the Inmarsat NCSC signal, otherwise it will be Off.
FD (red):	Frame Detect - Flashes each time a valid NCSC signal frame is received from the satellite. The LED is flashing at a rate of about 4 Hz, when the RX2 is locked onto the satellite. Otherwise it may be either On or Off.
DSP (red):	Digital Signal Processor - Flashing to indicate that the RX2 DSP is powered and running.



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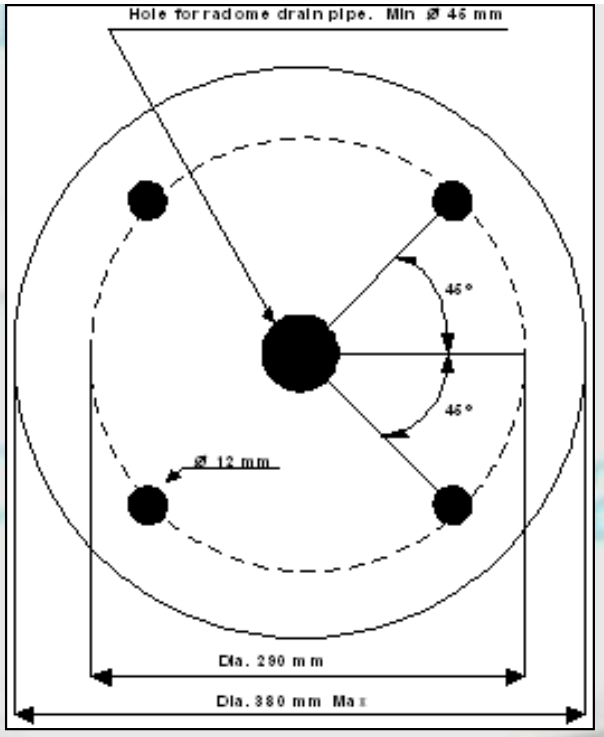
Replacing an existing Inmarsat-A system with a Fleet77

When an Inmarsat-A system has to be replaced with a Fleet77, following considerations should be taken:

1. The antenna platform can most likely be re-used, however it might be necessary to elevate it for obtaining a clear line of sight towards the satellite, as the Fleet77 antenna panel is positioned lower inside the dome than the panel in a typical Inmarsat-A system. A new mounting plate may also be necessary to allow access via the service hatch into the ADU.

2. It is highly recommended that the antenna cable are replaced, though these can be reused if within the specification given in the Installation Manual. However, please notice that many Inmarsat-A systems are using customized multi cables where re-use may be impractical.



Antenna cable specification:

Single 50 Ohm, double screened.
Max. RF-loss in 1.6 GHz = 11 dB
Max. DC-loss, R-loop = 0.54 Ohm

3. If the existing Inmarsat-A system was running on 24 VDC, the power cables provided should be sufficient. If the system was running 115/230 VAC, a power supply capable of delivering nominal 24 VDC (22 - 32 VDC) 240 W minimum must be provided. Thrane & Thrane is recommending a TT-3680F Power Supply.

4. Existing analogue phones fitted with RJ11 plugs can be re-used for both "Mini-M Voice" and "Speech". Though, please note that old pulse-dial phones do not fulfill the requirements of the RJ11 port and will not work. The phones have to be tone-dial type.

5. Analogue G3-fax machines used on the Inmarsat-A system can, if reconfigurable, be used for either "Mini-M fax" (2400 bps), "9.6 KBit fax" (future option) or up to 33.6 KBit fax by using the "3.1 KHz Audio" service. All three types of fax services are accessible via the X1, X2 or X3 (RJ11) ports on the BDU.

6. Phone Exchange Systems (PABX) can be connected to one of the RJ11 ports (X1, X2 and X3) on the BDU. Please note that the line voltage from the Fleet77 BDU is only 18 V RMS. Some PABX systems are requiring higher line voltage. A line booster can sometimes solve this problem.

7. For the data services the synchronous to asynchronous adapter and/or analogue modems used on the Inmarsat-A system become obsolete. Instead an ISDN modem must be purchased separately for the Fleet77.

8. Telex equipment installed with the Inmarsat-A system can be scrapped, as this service is not implemented in the Fleet system.

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BDU On/Off switch (reset)

The Fleet77/ff On/ Off switch on the rear side of the BDU is a mechanical switch controlling the power entry to the processor, which then is taking over the sequence.

By power up, press and hold the On/Off switch until light appears in the Handset Display and LED, at the Handset Cradle LED and the green LED on the front side of the BDU. Now release the On/Off switch, as the remaining Power On sequence is now software controlled.

By power down, press and hold the On/Off switch until the message "**Thrane Fxx Goodbye**" (xx = 77 or 55 depending of the Fleet system available) or when the green LED on the front side of the BDU starts flashing, this will take approx. 5 seconds. Now release the On/Off switch, as the Fleet77/55 has signed off the LES/NCS/Inmarsat system.

In some relations it can be necessary to reset the Fleet77/55, and that has to be done on the BDU On/Off switch. Unfortunately a problem has been identified, that the GPS module is not being reset correctly by this action, see "**Wait for GPS**".

Also when making changes in the setting-up via the FleetCP a reset is needed, and this will be done automatically by the FleetCP (version 2.02 and later) after the transfer of date to Super User and Service User areas have taken place.

If the software of the BDU locks up, often seen by the error message "**Handset Com Error**" in the Handset, also the BDU needs to be reset. But in this case the On/Off switch can not provide the reset function, as the software is not recognizing the signal from the switch. In this case the only reset possible is the "hardware" reset (switching off the mains switch for the Fleet77/55 or if no mains switch available, disconnecting the power connector on the rear side of the BDU). Please remember to unscrew the safety screws on the connector.

Please note that an automatic Power On is made if the supply power is recovered within 45 seconds, meaning if the power connector is removed and re-installed within this time limit. But also if mains power to the Fleet77/55 is lost but regained within the time limit at 45 seconds, the automatically Power On is done.

After the 45 seconds of Power Off of the Fleet77/55, it is necessary manually to press the On/Off switch, to power On the system.

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External power supply for BDU

The internal Power Supply Unit of the BDU has been designed as a +24 VDC, +30% / -10%, supply giving the input limit to be 21.6 - 32.2 VDC.

On earlier BDU, a label was indicating that the input power to the Fleet77 should be 18 - 32 VDC. This was a mistake and the label has been replaced on all units since week 1, 2003.

The Fleet77 power requirements are as follows:

Input power:	24 VDC (22 - 32 VDC), 10 A
Max power consumption:	240 W
Average power consumption:	180 W

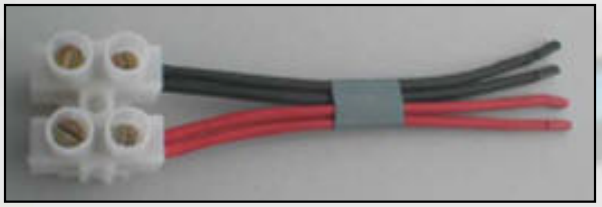
The Fleet55 power requirements are as follows:

Input power:	24 VDC (22 - 32 VDC), 10 A
Max power consumption:	200 W
Average power consumption:	150 W

In the BDU Software version 1.02 and later, a feature is built-in to monitor the input power and whenever the power drops below 20 VDC, the red LED below the Handset Display is lie and an error message is shown in the display. This message can also be read in the Alarm Log even though the input power has been re-established. A date and time is indicating the last power alarm. Whenever this alarm has been present, the external power supply should be suspected as not being able to provide sufficient power to the system.

In order to achieve sufficient input power to the Fleet77/55, as several cases have shown improper power supply to the system with multiple error messages and failures as a result, Thrane & Thrane is now offering an external power supply at 203VAC/115VAC/24VDC to 28 VDC, 20 A under the the P/N TT-3680F.

Also, as the power connector in the BDU only can use max. 1.5 mm core diameter (which in fact also is the minimum core diameter recommended), it often has been seen insufficient cabling resulting in too low load to the system. Again this can and will cause multiple error messages and failures. The power cables shall also be as short as possible to minimize the power loss. Thrane & Thrane will therefore from ultimo Marts 2004 add a power connector/ adaptor with big terminal points for the vessels power cables.



To make sure (if in doubt) that the supply power is sufficient, a measurement directly at the power connector on the BDU while making an ISDN data call should be performed. This will give the heaviest possible load of the system, without the motors are moving the antenna (which would have been the ideal situation). The measurement of the input power may never drop < 23 VDC. Use an oscilloscope to make the measurement, to get a precise indication, as analogue or digital meters are only giving an average measurement which can be too imprecise.

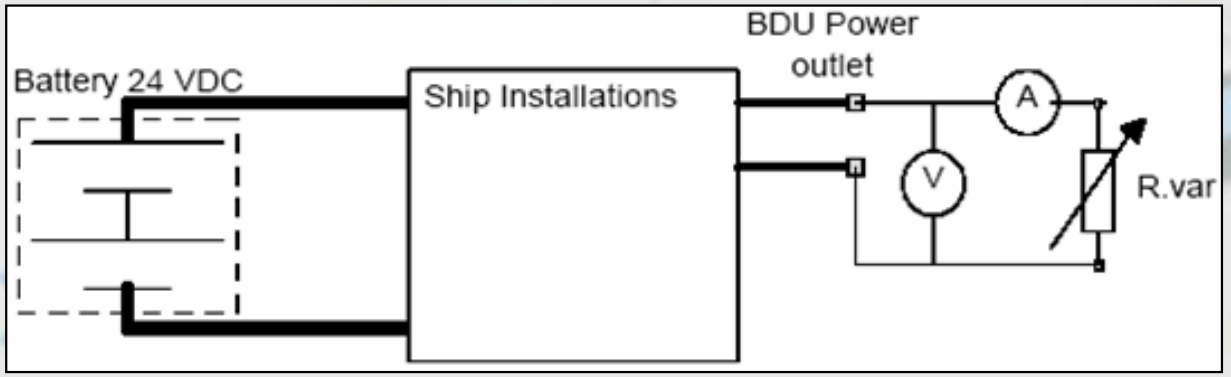
A more theoretical way of checking the input power to the BDU is:

The length of the BDU power cable depends on the type of cable used and the source impedance of the ships 24 VDC installation. It is required that the total source impedance at the BDU does not exceed 250 mOhm.

Select a power outlet from the ships 24 VDC system, and measure the source impedance of the ships installation as described below:

1. Measure the voltage without load (R.var disconnected).
2. Set the current to e.g. 1 A by adjusting R.var.
3. Measure the corresponding voltage change.

Example:
1 A and 50 mV.
Source impedance: 50 mV/1 A = 50 mOhm



If a 50 mOhm ship source impedance is measured, only 200 mOhm is left for the power cable loop resistance (250 mOhm - 50 mOhm = 200mOhm).

If the total source impedance is too high, the voltage drop when the Fleet system is turned On, is so large that the system turns Off again. When it turns Off, the voltage drop goes down to zero and the system turns On again, and therefore the system rapidly turns On and Off.

The cable inductance should not exceed 5 uH. If the inductance is too high, the Power Supply may start to oscillate. You will hear an oscillating noise from the Power Supply and the antenna voltage will be insufficient.

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TT-3680F Power Supply

As it has bee recognized several times, the supply power to the Fleet77/55 has often been too weak.

Thrane & Thrane has the following power specifications for the systems:

The Fleet77 has the following power requirements:

Input power:	24 VDC (22 - 32 VDC), 10 A
Max. power consumption:	240 W
Average power consumption:	180 W

The Fleet55 has the following power requirements:

Input power:	24 VDC (22 - 32 VDC), 10 A
Max. power consumption:	200 W
Average power consumption:	150 W

If the supply power to the system drops too much, multiple failures can be seen, e.g.:

- Antenna (FEU) link down
- ACU Comm. failure
- SU Comm Error
- Power has dropped down below 20 V
- RX2 ctrl error AutoTune
- Ctrl Logic ACU Matrix

In this list of error messages, the mostly important line is the "**Power has dropped down below 20 V**" as this is indicating that there is/has been a power problem onboard. When the error message is seen, it is also just registered once, as it is only the last occurrence that is reported in the Alarm Log. In fact the error message could have been generated several times.

React to this error message.

Thrane & Thrane are able to to deliver an external power which can deliver sufficient power to the system. This Power Supply is identified as TT-3680F and can be inputted 230 VAC, 115 VAC or 24 VDC (battery). Output is 28 VDC, 20 A.

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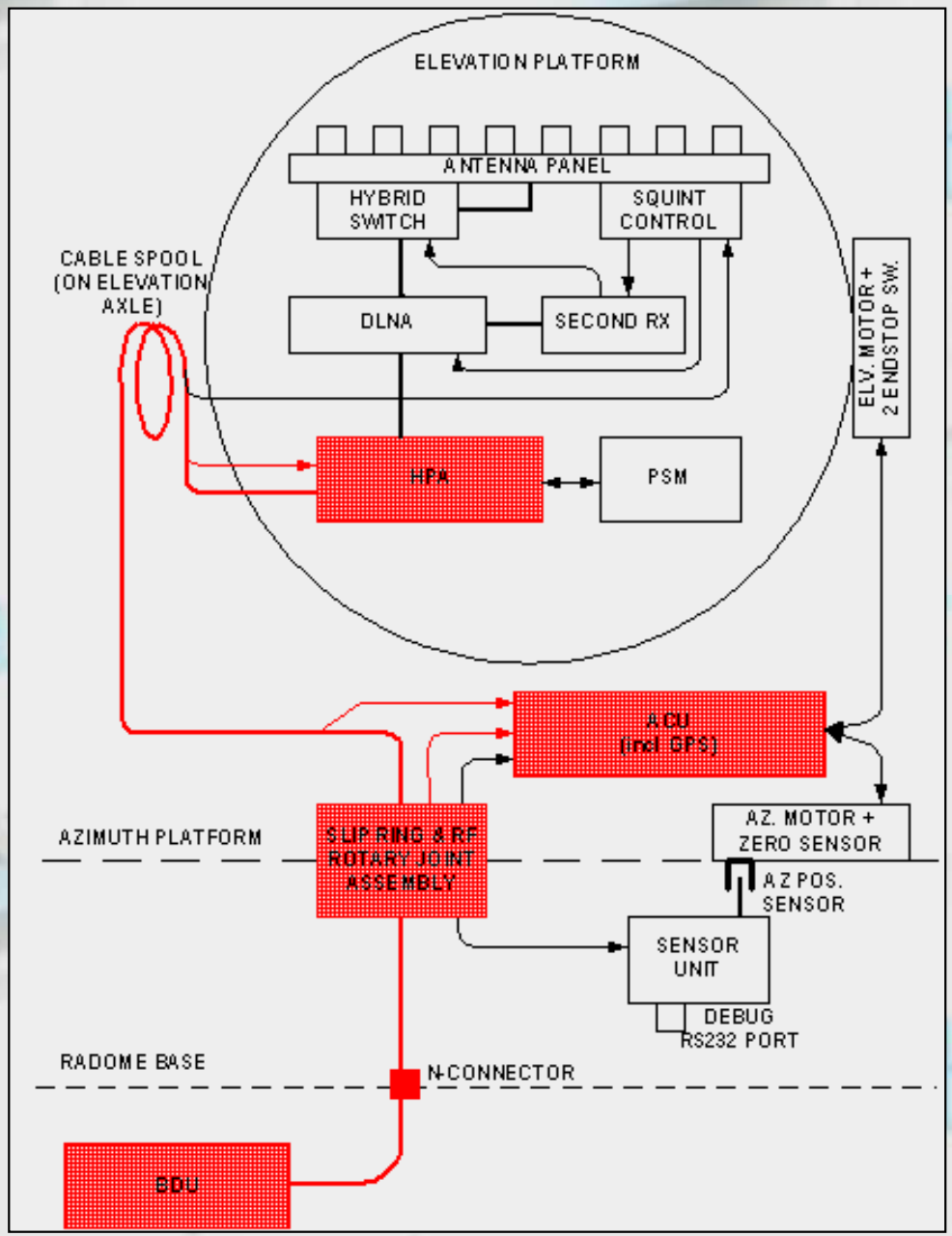
Antenna (FEU) Link Down

The actual error message is stating that the communication between the BDU and the Antenna is broken, and the information in the Handset is also recommending that the Antenna Cable and connections are inspected.



BDU/ADU communication:

The BDU is communicating with both HPA and ACU in the ADU.

The communication is sent from the BDU as modem communication via the RF cable, going through the SRA, where it is separated from the RF signals and power, passed through ring and brushes, and rejoined before sent to the HPA. Here data addressed to the HPA will be handled. Data addressed to the ACU will be led further down to the ACU via communication cable.

Same for the data back. The ACU data is sent via the HPA back to the BDU, while HPA data is going direct to the BDU.

As the communication is going through the SRA, this could also be subject to the failure. Please check the SRA following the Slip ring continuity test.

Several times it has been noted, that the HPA software crashes, causing the error message "**Antenna (FEU) Link Down**" to pop up in the Handset display.

Just as often, an upload of software to the HPA has momentarily and temporarily solved the problem. The HPA software is resident in the BDU, as a part of the BDU software upload. The procedure for uploading the software to the HPA is as follows:

1. Press Menu-key on the Handset.
2. Scroll down to "**Super User"**, press OK.
3. Enter the SuperUsr PIN code, press OK.
4. Scroll down to "**Ant.Setup**", press OK.
5. Scroll down to "**Upload FEU**", press OK.
6. Accept the request of "**Upload OK?"**, by pressing OK.
7. Texture in Handset display: "**FEU Upload**" is flashing and the message "**Please Wait!"**
8. When message "**FEU Upload Done**" is shown, press Exit three times.

The reason for the HPA software crash has been located to a software bug in the HPA software combined with an insufficient external power supply to the Fleet77/55 system.

A drop in power to the HPA could result in an incorrect interpretation of data between ACU and BDU. In the HPA this interpretation was seen as a “delete” command and 128 lines of software in the HPA was deleted. In most of the cases, the deleted lines was in the operative program, and a reload of software would re-establish the operation of the HPA. In few cases, the deletion of lines was also deleting lines of the “boot-loader”, which will cause the HPA upload to fail. Only replacement and return of the HPA to T&T will in this case solve the problem.

The software bug in the HPA software has been solved in the HPA SW ver. 1.02 which has been included in the BDU software since BDU SW ver. 1.08. Also from the BDU SW ver. 1.08, a checksum calculation of the HPA software is made, and if a mismatch is detected, by power on, an automatic upload of HPA software is done.

But the actual problem in this case has been the external power supply to the Fleet77/55. Please read and check the FAQ: Handset and/or Alarm Log shows "**Power has dropped below 20 V**".

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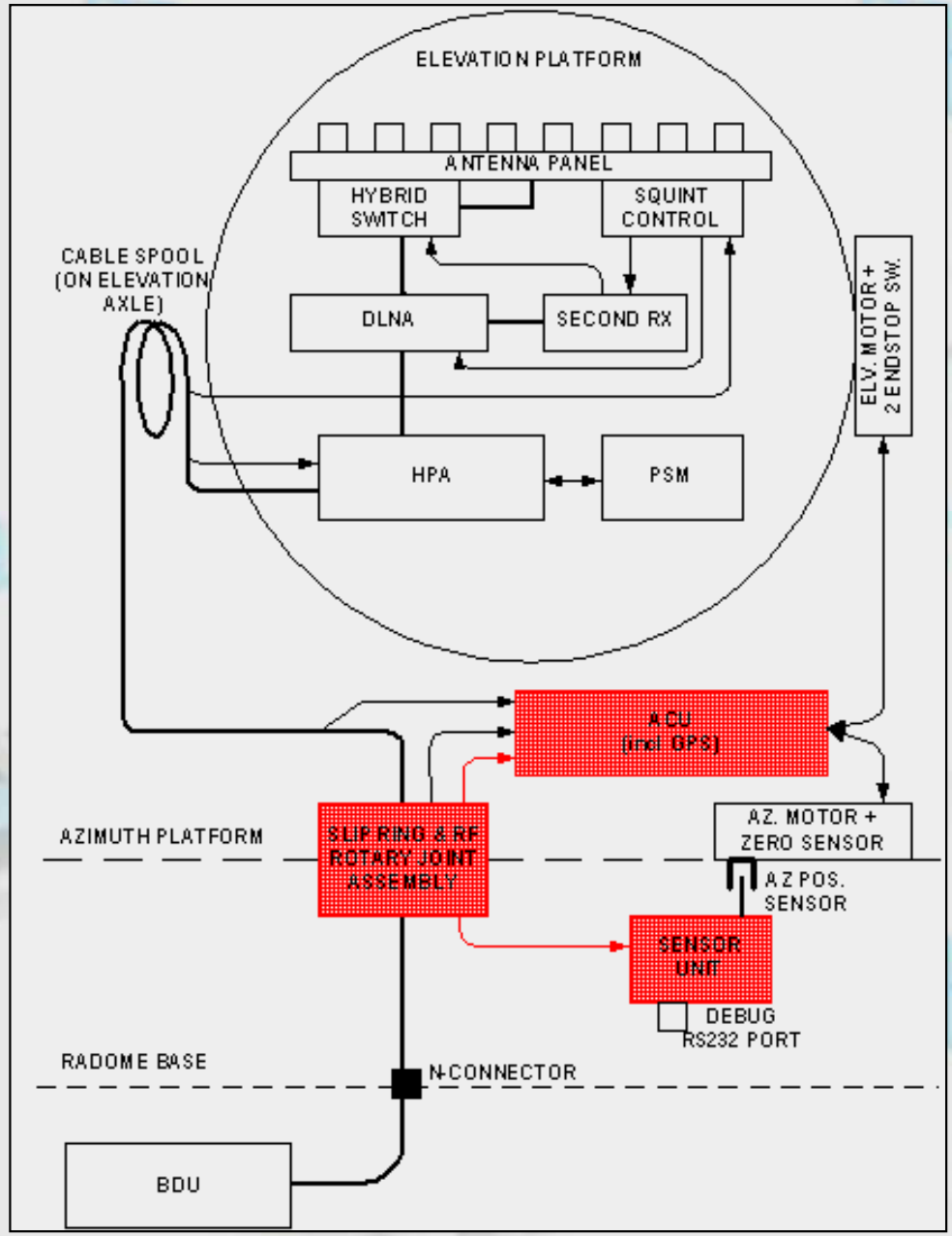
SU Comm Error



First of all the Sensor Unit (SU) is powered by the Antenna Control Unit (ACU) by +5 VDC. The +5 VDC and Ground is passed via the cable 660-A0092 through the Slip Ring Assembly (SRA) to the SU. The SU LED D1 will be flashing when the SU is powered.

The communication between the ACU and SU is going as request of data from the ACU to the SU. The SU will response with ship motion data back to the ACU. The SU LED D2 will flash every time the SU is responding to a valid command from the ACU.

The error message "**SU Comm Error**", is shown in the handset display when the communication between the ACU and the SU has been lost.

As the communication link between the ACU and SU goes through the SRA, which also should be taken in consideration when troubleshooting. The connectivity through the SRA can be checked by performing the Slip ring continuity test. Also the cable between the SRA and ACU should be suspected as well as a failing part, please check the connectivity from this scheme Cable 660-A0092.

The parts involved, which can cause the fault, are:

- Sensor Unit (SU)
- Slip Ring Assembly (SRA)
- Antenna Control Unit (ACU)
- Cable between SRA and ACU.

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Wait for GPS

The alarm message "**Wait for GPS**" indicates that the Fleet77/55 has not received valid position data from the built-in GPS module within 4 minutes.

Normally the built-in GPS will acquire synchronization with three (which is the minimum requirement for a valid position fix) or more satellites within a couple of minutes or less if the antenna is positioned with 360 deg. free sight.

However, we have occasional observed that during configuration or other settings requiring the system to restart, the internal GPS does not start up properly due capacitors on the 3 VDC PSU has not been completely discharged causing the GPS to be “hanging” on the remaining supplied power.

The problem is solved in the ACU software version 2.15 (Fleet77)/version 1.05 (Fleet55) or later. In previous software versions the remedy was to switch off the Fleet77/55 terminal for above 15-20 minutes allowing the capacitors in the PSU to discharge.

Finally, the problem can also be due to a defective GPS module on the ACU. This will have to result in a replacement of the ACU.

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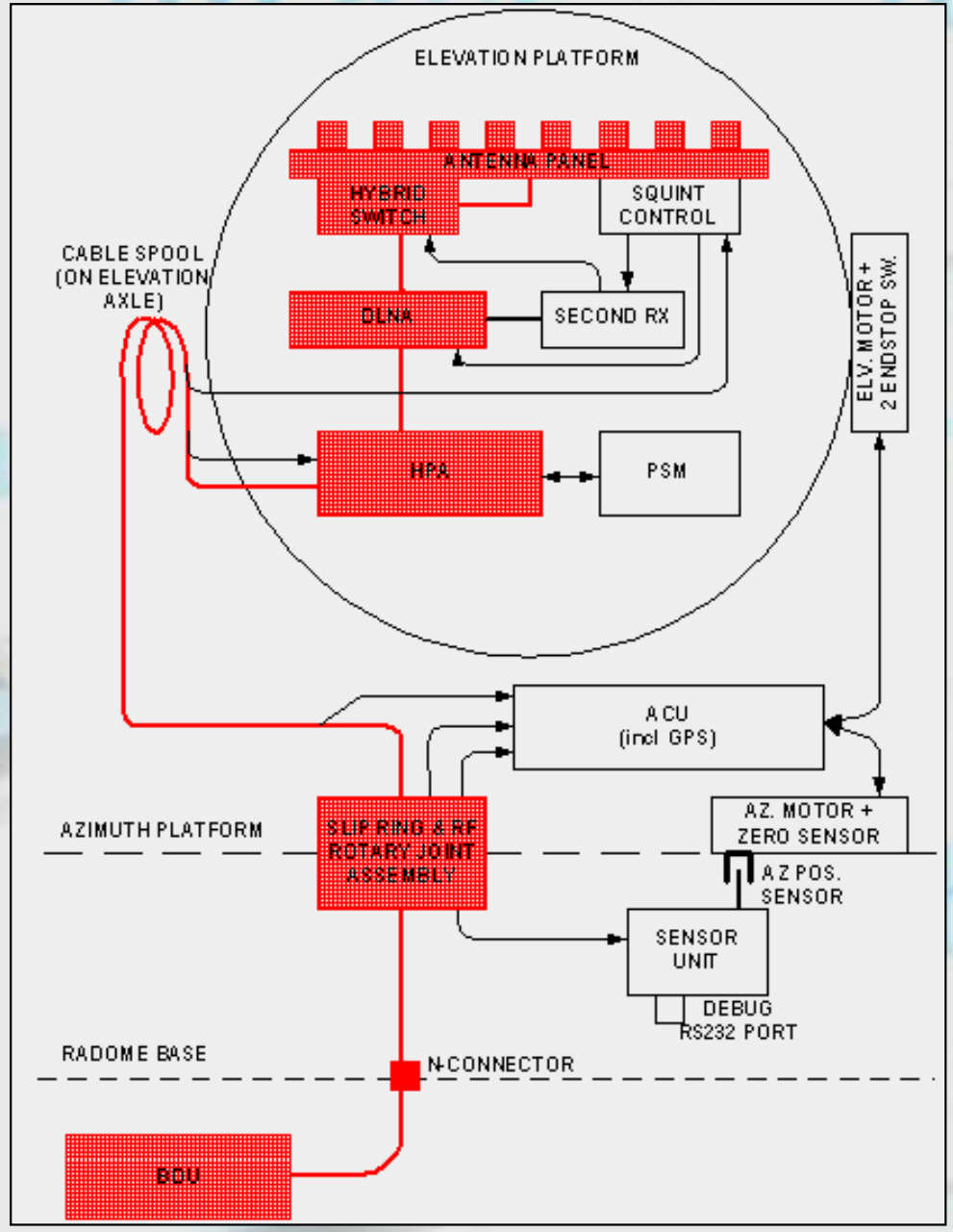
Cause Code 12C4$_h$ general

When a call is initiated one of the first replies from the LES is "Authentication query". The response time is known by the MES, and when it times out, without the expected response, the cause code is shown.

The cause code "**12C4$_h$**" has the following meaning:

12C4$_h$: MES is clearing the call because the "authentication query" transmitted from the LES has not been received by the MES within the allowed time limit.
Translated into clear text: The call from the MES has not been recognized by the LES, and naturally the LES is not able to respond to the call. Therefore when time is out the MES gives this error message and clearing the call).



As all information within the Fleet77/55 is indicating no failure, the system will perform the call. Almost the only point where the transmission is not sensed is in front of the panel, therefore when all other circuits is stating "transmit" there is no indication whether the RF is sent up towards the satellite or not. The last stage where the signal is handled before going into the space is the HPA. If the yellow LED of the HPA is On, it is an indication that the entire transmit chain is in Tx mode.

That means that the BDU has made all the RF modulations of the call.

These signals are sent through the antenna cable to the Slip Ring Assembly where separated from the power and modem communication. In the Slip Ring Assembly the RF will pass through the Rotary Joint, and on the other side assembled again with the power and modem communication.

When assembled, the combined information is passed on in the Cable Loom to the HPA.

In the HPA separation is again performed, and the RF signals are powered up to High Power.

The High Powered RF signal is passed through the diplexer part of the DLNA, into the Hybrid/Squint PCB and then into the Antenna Panel.

From the Antenna Panel, the RF is beamed up to the satellite.

Back to Handset Messages

Cause Code $12C4_h$, in High Speed service call

We have noted, that when the cause code "**$12C4_h$**" only appears when performing High Speed service calls (Speech, 3.1 KHz Audio and 56/64 Kb ISDN) but the Mini-M Voice service calls is OK, the system seems to be able to transmit and thereby also to sign in and perform the request of call. This could indicate that the modules of the ADU are OK. We have seen that in several cases that the RF cable is the cause of error.

In the BDU SW version 1.04 and later, Cable Loss readout can be found. This functionality is testing the RF antenna cable and the connectors, and is as result giving the compensation made, in percentage, to match the cable loss. When the Cable Loss percentage reaches 100% there is no more compensation possible. From then the signals will only be subdued.

Cable loss value can - after having switched the Fleet system OFF and ON again - be checked by the following:

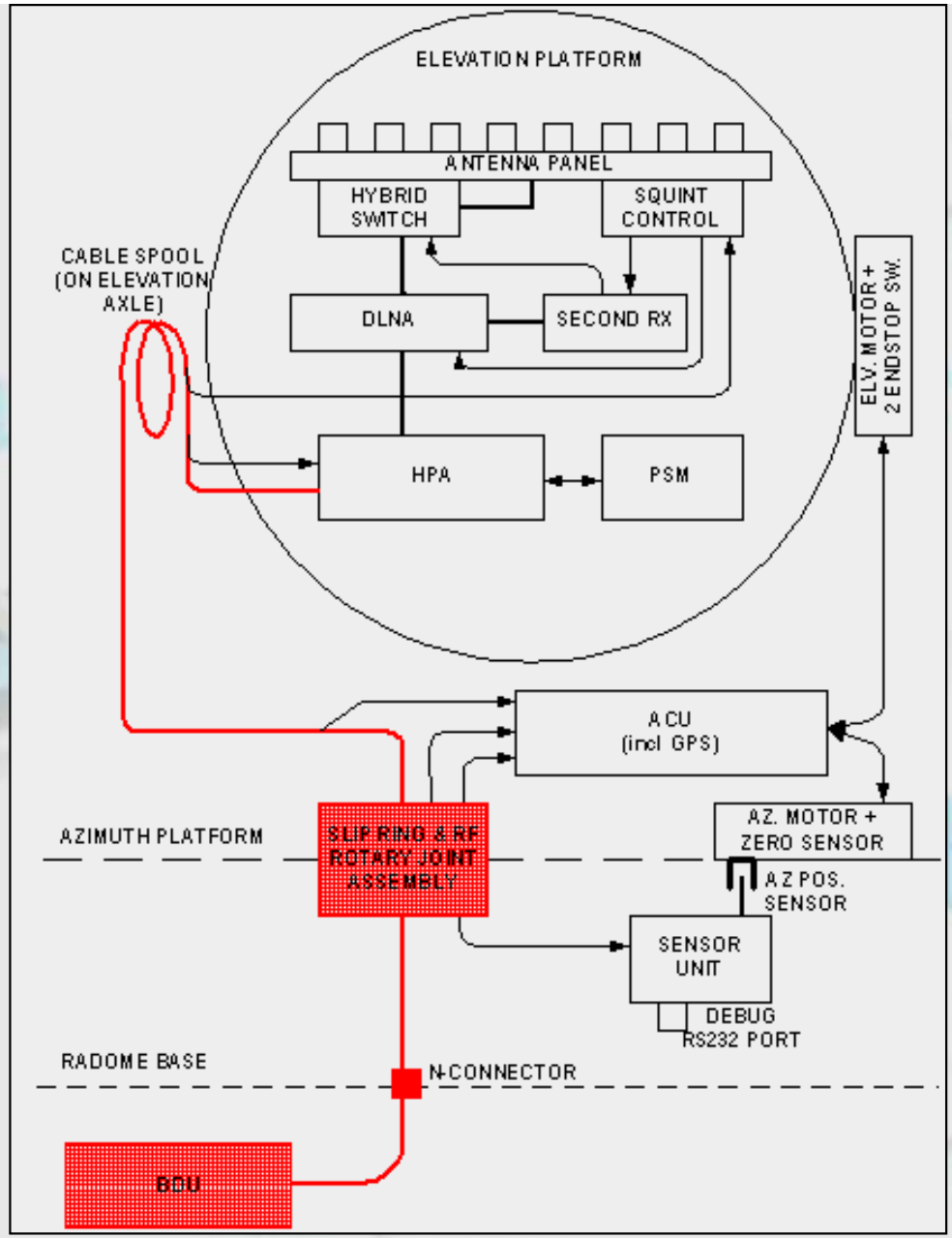
Note: The Cable Loss is measured and the figure in the handset updated only during power-up of the Fleet system.

1. Enter Menu.
2. Scroll down to "**Status**", press OK.
3. Scroll down to "**Antenna**", pres OK.
4. Accept "**FEU**" by pressing OK.
5. Scroll down to "**Cable Loss**" and read the compensation percentage.
6. Press Exit four times.

The Cable Loss should always be < 100%.

Also the Gain could be a factor to cause the "**$12C4_h$**". Check the Gain by the following:

1. Enter Menu.
2. Scroll down to "**Status**", press OK.



3. Scroll down to "**RF block**", press OK.
4. Scroll down to "**Gain**" and read the amplification factor
5. Press Exit three times.

The Gain should always be 120 +/- 20.

If out of specification:

Replace the BDU.

If within the specification:

1. Disconnect the antenna cable from BDU.
2. Disconnect the antenna cable from the ADU.
3. Short circuit the antenna cable in the one end.
4. In the other end, check the DC loop resistance.
   - Fleet77: < 0.54 Ohm
   - Fleet55: < 0.75 Ohm
5. If > 0.54/0.75 Ohm.
   - Replace the Antenna cable.
6. If < 0.54/0.75 Ohm.
   - Check the connectors (in ADU and BDU).
   - Replace the Cable Loom.
   - Replace the Slip Ring Assembly.

Back to Handset Messages

Handset Com Error

All functions freezes, and it is not possible to power Off the system on the Power On/Off button on the rear side of the BDU.

The error message "**Handset Com Error**" is very rarely seen being a failure in the handset. The error message is generated in the handset it self, whenever the BDU is not prompting the handset, and then the message is shown.

Most often it has been seen that the processor of the BDU is busy, and therefore is not able to communicate with the Handset, and this causes the error message. The problem has often likely been that the BDU CPU has stopped or the program of the BDU has gone into a "loop", from where it can not leave. It has also been seen, that the ACU in the ADU are "bombarding" the BDU CPU with error messages, and then the BDU will be too occupied handling these messages.

Follow this check procedure:

1. Remove all external equipment, Antenna, RS232, AUX one by one.
2. Check the handset.
    a. Does "**Handset Com Error**" still appear ?
    b. If Yes:
        i. Remove power on the power On/Off switch or the mains switch (it is possible that the power connector have to be removed from the BDU).
        ii. Does "**Handset Com Error**" still appear ?
        iii. If Yes:
            1. Upload latest BDU software version.
            2. Or replace the Handset.
            3. Or Replace the BDU.
        iv. If No:
            1. Check the Alarm Log and Warning Log for resent alarms/warnings.
                a. E.g. low voltage to the system may cause the error and therefore look for "**Power has dropped below 20 V**" in the Alarm Log.
    c. If No:
        i. What type of external equipment did cause the error ?

ii. Try to connect the equipment again.

iii. Does "**Handset Com Error**" appear again ?

iv. If Yes:

1. Disconnect and check the equipment for failure.

2. If antenna:

a. Check that the DSP LED on the ACU is flashing.

i. If NO, check the 40 VDC supply to the ADU.

b. Check that the BITE ERROR LED on the ACU is Off.

i. If No, check the ADU by running the Antenna Diagnostic program, check the Errors & Warnings.

c. Check the ACU RxD and TxD on the ACU is flashing.

i. If No, check the communication cables.

v. If No:

1. Log the history. What did happen just before the error message was shown ?

2. Was it during a call ?

3. Did anything happen to the mains power to the system ?

4. Was other equipment in use, Radar, HF Radio etc. ?

Back to Handset Messages

Clock error, Set the time

This s not a real error, as the system will be able to perform. This is a message that the internal clock of the BDU is not running at UTC time. The BDU clock is used by the system in the Call Log, the Alarm Log and the Warning Log, and only for presenting a date and time for the event. As the calling invoice form the LESO/ISP generally is listed in UTC time, it will be mostly convenient that the BDU also is running UTC time, as it will be easier to cross-check the Log.

If any other time than UTC time is wanted (required), this time can be entered, but the "**Check Error Set the time**" will be shown. By just accepting on the Exit button, the error message is cleared for 24 hours. After that the messages will again be shown and can be postponed like before.

As the Fleet77/55 is also equipped with a GPS receiver, and this is receiving the clock information in UTC, this will be used to verify the BDU time. Whenever there is a mismatch between the GPS time and BDU time of more than 180 seconds, the error message "**Clock Error Set the time**" will be shown, and it has to be corrected manually. If the mismatch between GPS time and BDU time is less than 180 seconds, the time will be automatically corrected.

The manually correction is done as follows:

1. Enter Menu
2. Scroll down to "**Super User**", press OK
3. Enter the SuperUsr PIN code, press OK.
4. Scroll down to "**Set UTC time**", press OK.
5. Enter the correct UTC time, press OK.
6. The time will be stored, press Exit.
7. Scroll down to "**Set UTC Date**", press OK.
8. Enter the correct UTC date, press OK.
9. Press Exit three times.

Back to Handset Messages

Call spacing too short

The Inmarsat satellite phone system is working a bit different than the ordinary terrestrial network. Therefore a normal use and performance of calls on the terrestrial network can not directly be copied to the satellite phone system.

The error message "**Call Spacing Too Short**" normally occurs when a new call is initiated from the Fleet77/55 terminal before the Inmarsat network has reached “Idle” status. It normally can take 15 – 20 sec. to fully disconnect a call via the satellite and make the "line" ready for a new call.

Therefore, precautions should be taken, when external equipment such as fax machines, modems etc. with automatically redialling functions is connected to the Fleet terminal. Please insert a waiting time on the external equipment at ½ - 1 minute before initiating a new call.

We also have in few cases experienced that the error message was caused by a defective DLNA caused the error message, but it has been difficult to positively verify that statement.

Back to Handset Messages

Wait for NCS

NCS = Network Coordinating Station.

"**Wait for NCS**" occurs when the Fleet has not been able to read or download the bulletin board from the NCS. Please allow time for the Fleet to read or download the bulletin board.

> The bulletin board contains the status and information about which LESO’s are available in the different Ocean Regions and is maintained by the NCS. It is retransmitted 24/7/365 and is stored in the Fleet when powered Off.

The "**Wait for NCS**" could also be an indication that the Fleet77/55 antenna is not able to receive the signal from the satellite.

If the satellite signal is not available within 3-5 minutes, it will be necessary to investigate further.

First of all, check that the antenna is turning, that it is performing a sky scan. It have been seen, that some “warnings” is causing the antenna after it has initialized to move to heading and 0º elevation, which is the "ready" position. Under normal circumstances, the BDU will send the next command to the ADU/ ACU to “find the satellite” by a search command. But some "warnings" information to the BDU is just causing the BDU to await a correction of the problem before proceeding. One warning message could be RX2 rssi too low.

If the antenna is turning performing the sky scan, check whether the green **Sync** LED in the Handset is from time to time is flickering on. This will indicate that whenever the antenna panel is passing the signal beam from the satellite, it is receiving the signal. It should also in that situation show a raise of the C/ No. C/No can be found by pressing 2nd and 9 (Ant) in the Handset key pad.

The C/No are normally > 58 dBHz.

If no signal is seen the problem is most likely a defective DLNA, to be replaced. Of other modules that could be defective is the Antenna Panel or a defective Slip Ring Assembly. Also a degenerated Antenna cable could cause the problem, check the Cable Loss.

If signal is seen the BDU is most likely the defective part, but also the Slip Ring assembly could be defective.

Back to Handset Messages

RX2 rssi too low

The warning message "**RX2 rssi too low**" can be read in he Antenna Diagnostic Program under the "Warnings & Errors" or in the Handset if the Fleet77/55 has been updated to SW ver. 1.08 or later. Do the following:

1. Press Menu
2. Scroll down to "**Super User**", press OK.
3. Enter the SuperUsr PIN code, press OK.
4. Scroll down to "**Warning Log**", press OK.
5. Accept "**View Log**" by pressing OK.
6. Read all Warnings, especially the one(s) indicated by an asterix (*).
7. Press Exit four times.

The warning message could be indicating that the DLNA is not powered, that the 5 VDC power from the Hybrid/Squint PCB is interrupted. If the DLNA has been replaced for other failures, and now indicating the "**RX2 rssi too low**" inspection whether the power connector at the DLNA is installed. Check also the 5 VDC supply from the Hybrid/Squint PBC.

A defective DLNA is the mostly seen cause to this warning message.

This warning message will, after the antenna has initialized, also cause the antenna to turn to the "ready" position which is heading and 0º elevation, and wait for further commands.

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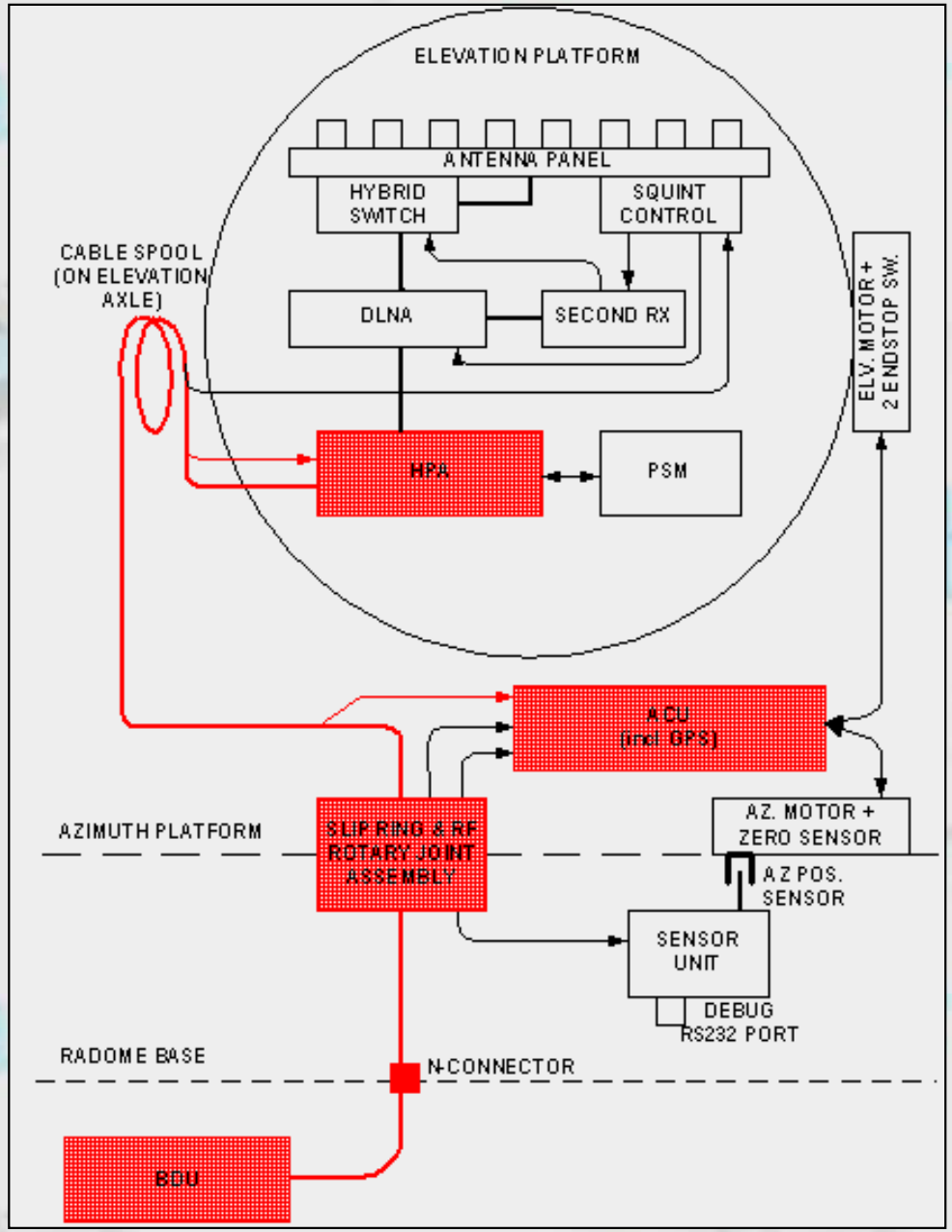
ACU Comm. Failure



The error message "**ACU Comm. Failure**" is shown when the communication between the BDU (via the HPA) and ACU has been lost.

When troubleshooting, please observe that when the error message "**ACU Comm. Failure**" is generated, it may be followed by other error messages (e. g. "Antenna (FEU) Link Down") and actions should be taken accordingly.

However, the first step in troubleshooting when the error "**ACU Comm. Failure**" shows up is to check the DSP LED of the ACU is flashing, which is indicating that the ACU control software is running. If the LED is not flashing, check whether the 40VDC is supplied to the antenna and ACU.

If the DSP LED is flashing, check that the RxD LED of the ACU is flashing, indicating that the ACU is receiving data from the BDU via the HPA.

If the RxD LED is not flashing, the problem could be in one of the following components: Cable Loom, HPA, PSU, ACU or the BDU.

Still, if the DSP LED and the RxD LED is flashing, check also that the TxD LED indicating the ACU is responding to data from the BDU.

If the TxD LED is not flashing the problem, persist in the ACU.

If both the TxD and RxD LED's are flashing, the problem can be due to defective Cable Loom, HPA or PSU.

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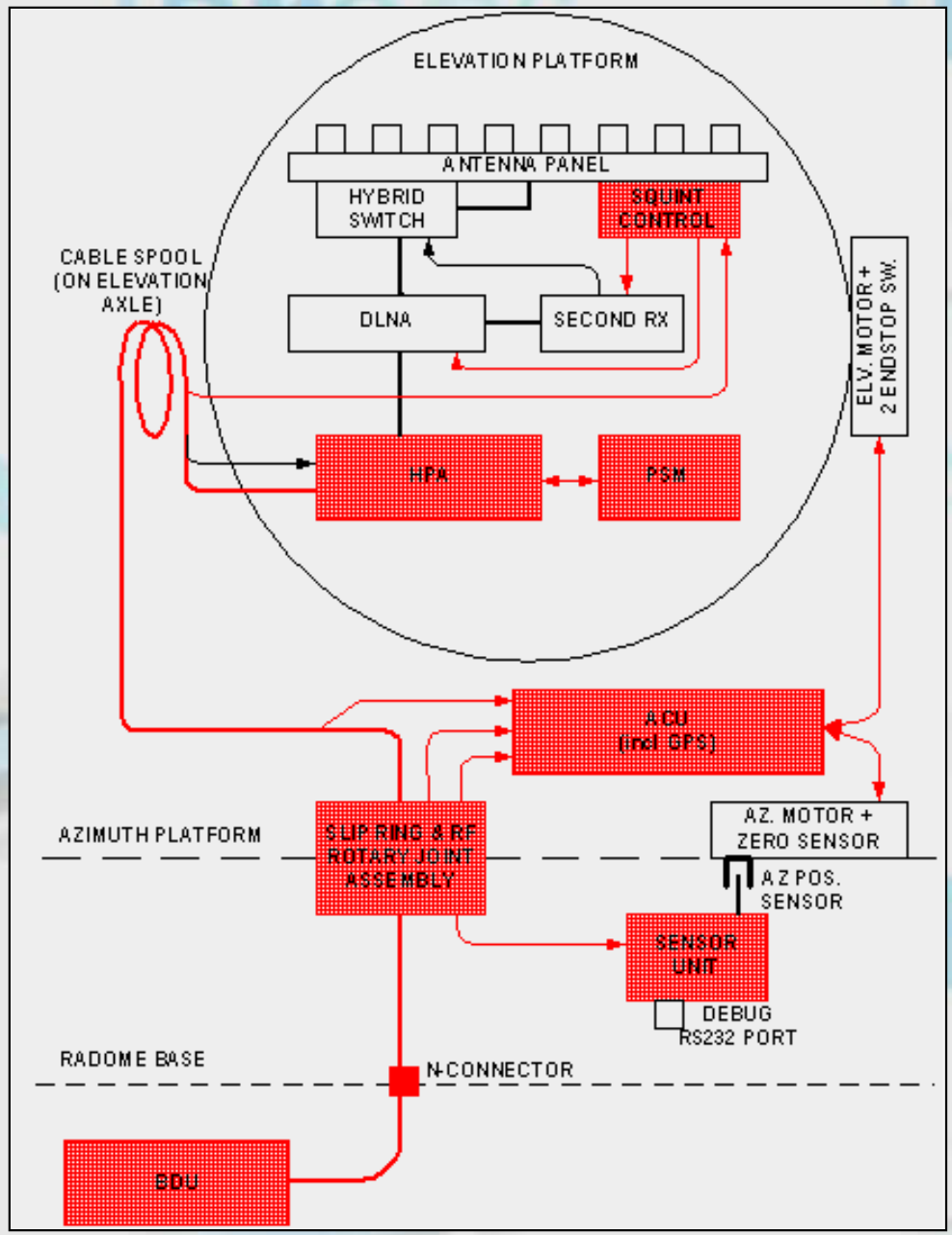
Antenna power distribution



40 VDC is delivered from the PSU of the BDU and is outputted the antenna connector (X6) to the ADU RF N-connector on the dome. In the antenna the 40 VDC will in the SRA be separated from the RF and modem communication in the bottom PCB of the SRA. The 40 VDC will be sent via rings and brushes. In the top PCB of the SRA will be outputted via the Molex-connector for the ACU. But also the 40 VDC will on this PCB be assembled with the RF and modem communication and sent to the HPA.

In the HPA the 40 VDC will again be separated from RF and modem communication and sent to the PSM. A yellow LED here will indicate that the PSM is powered and running, when the 40 VDC is available. This PSM will transform the power down to 5 VDC to the blower/fan of the HPA and a 5 VDC to the HPA drivers and processor. Also the 40 VDC will be transformed to a 28 VDC used by the HPA to amplify the signal, when going in transmit mode. The 28 VDC is in fact 16 – 28 VDC depending of the service requested, as HSD is requiring more than the Mini-M service. A green LED on the PSM will lit to indicate the power on to the fan, and the fan will rotate (but only by request from the HPA). Another green LED on the PSM lit to indicate that the power to the HPA processor and drivers. Last a green LED will lit to indicate the 28 VDC power out to the HPA. When the HPA is powered with the 5 VDC, a red LED on the HPA will flash to indicate processor is powered and running.

In the ACU the 40 VDC is inputted the internal PSU, which will output 5 VDC to the internal processor and drivers and also to extern modules in the ADU. These modules are: SU, Hybrid/Squint PCB, AZSA and End Stop Switches.

The 5 VDC power to the SU is sent to the top of the SRA in the Molex-connector and sent via ring and brushes to the SU. The availability of the power to the SU can be verified at the D1 LED on the SU which will be flashing to indicate that SU processor is powered and running.

From the Hybrid/Squint PCB the 5 VDC is distributed to RX2 and DLNA.

The 5 VDC power availability to the RX2 can be verified at the DSP LED of the RX2 (the new type only), which will be flashing to indicate that the processor of the RX2 is powered and running.

Back to General

Antenna can not be reset

When upgrading the BDU SW which in some cases also is automatically uploading HPA SW, or when HPA SW manually is uploaded, this HPA upload is not performed. The red Alarm LED of the Handset is lit, and an alarm "**Power Down Failed**" will be shown. Also in the Alarm Log under FEU this alarm will be present.

The power to the ADU will be reset, by shortly cutting the 40 VDC power to the antenna, but it has been seen that this reset power down pulse is not given from the BDU.

To check this reset pulse, disconnect the brown coax cable on the HPA. This should force the BDU to reset the ADU, and it should be possible to see that the antenna is only moving in short jerk and then stop. Also it could be seen that the DSP LED of the ACU flickers on for a short moment and then goes off for a longer period. The sequence is approx. 2 sec. on and approx 10 sec. off.

If this is not the case, the PSU of the BDU is defective and have to be replaced. Alternatively replace the BDU complete.

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Vibration sensible SU

It has been seen that the antenna could perform normal when the vessel is steady at the pier in harbour. Whenever vessel is moving or vibration of the vessel (and thereby the antenna) starts, the antenna is loosing track of the satellite.

The antenna panel will move dramatically and if the signals from the SU are not countering these movements and are symmetrically, the antenna panel will end up hitting one of the End Stop Switches causing the antenna to reset.

In some very few cases, it has been seen that the sensibility of the SU has been that that bad, so by just tapping the SU box was enough to get the antenna panel to start motion.

In the case of this very sensible SU, run the Antenna Diagnostic SW Program. Perform the Sensor Unit Test and monitor the Gyros, Inclinometers and Accelerometers.

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Grounding of the Fleet77/55

Several questions have been received regarding grounding of the Fleet77/55 systems, since in some cases it is difficult to use the instructions in the installation manual. In several cases it has also been seen that the grounding is not properly made.

In order to assist in making the right decisions regarding grounding, here is some information:

The grounding of the coax cable in the BDU end is required for safety reasons. In case where lightning strikes the vessel there is a risk that the induced voltage will travel via the coax cable and it can potentially harm the operator as well as damage the BDU. This grounding MUST be done using the grounding clamp supplied with the Fleet77/55 system.

Grounding of the BDU itself is to ensure potential alignment when the coax cable is disconnected and connected to the BDU. (The BDU chassis' potential is free floating relative to the power supply; hence there is a risk of static charges damaging the equipment when the coax cable is connected).

Grounding of the antenna is for EMC reasons (immunity to high power HF transmitters/antennas on board). Please note that the coax cable MUST follow the ground path closely in order to create minimum "antenna loop" effect. On wooden, fibreglass and other non-steel vessels, grounding of the antenna can be more complicated than just ensuring proper electrical connection of the mounting bolts to the antenna platform. An individual on board evaluation is required. In case of aluminium vessels/constructions, please consult the yard before attempting to make any grounding since incorrect grounding may lead to heavy corrosion of the hull/aluminium constructions.

Steel vessels:

The present description in the installation manual TT98-116875-C is written for steel vessels, where everything from keel to mast is welded together. Please note that the coax cable MUST follow the steel surfaces closely in order to create minimum "antenna loop" effect.

Other vessels:

We are working on a better description of the grounding issue for the installation manual, and will revert when we are ready with an official new version of the installation instructions.

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USB port of the Fleet77/55 BDU and a USB-to-RS232 adaptor

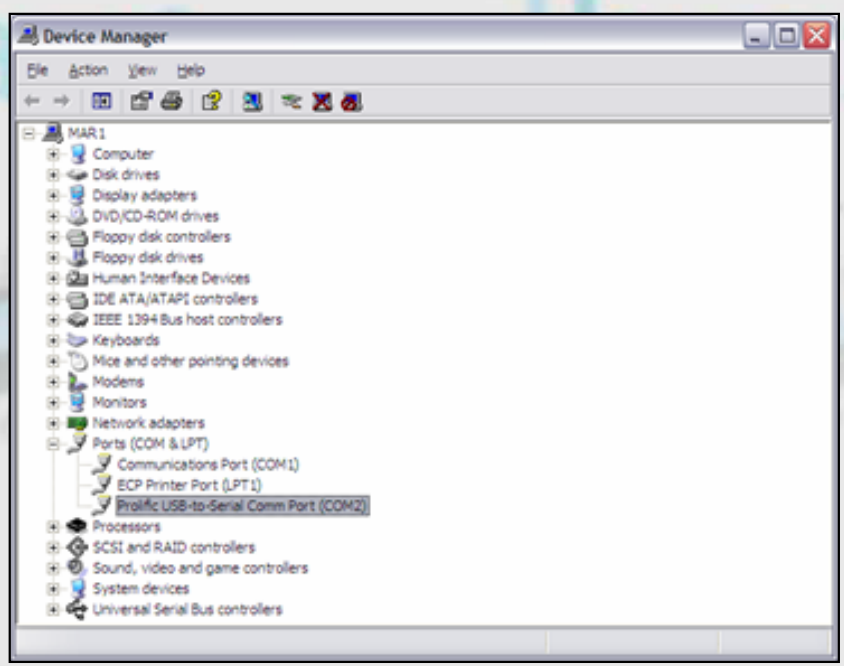
The USB port (X8) of the Fleet77/55 BDU is not enabled.

Some computers are not equipped with a Com port or doe's not have enough Com ports available. In this case it is a solution to add additional ports via a USB to serial port adaptor.

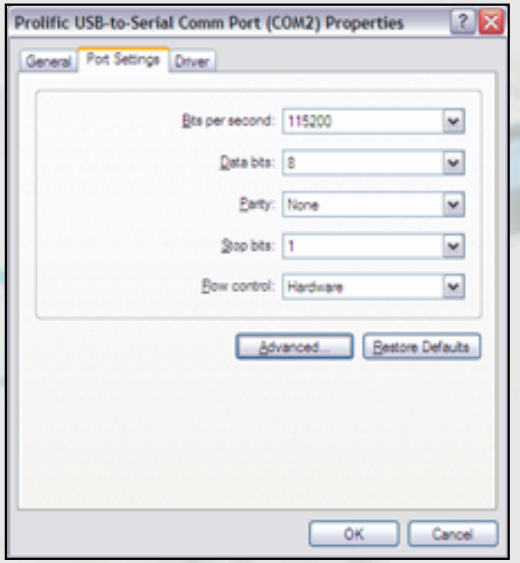
Thrane & Thrane is able to provide an USB à RS232 adaptor. The adaptor is on our stock on p/n S-37-119758.

To use such an adaptor, just insert the USB converter in your PC (Win 98SE or later) and it will be detected automatically. When prompted for the drivers, just select the CD drive (with the CD disk received together with the adaptor, containing the drivers, inserted).

Now the adaptor is installed and behaves just like a regular Com port. In the Control Panel / Device Manager please double click on the new Com port.



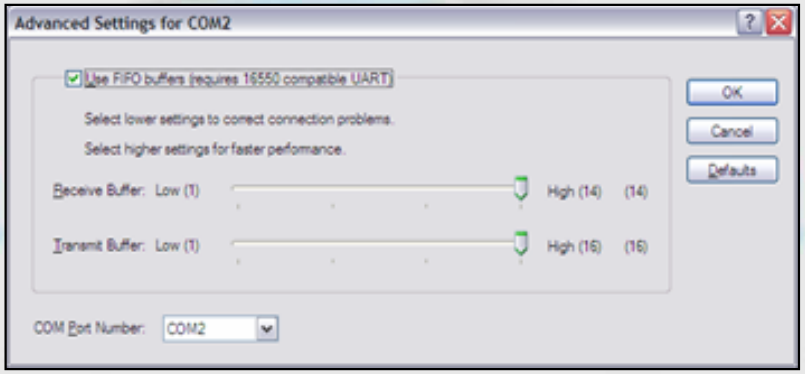
In port settings please verify your port speed.



Recommended port speed is:

115200 bps
8 data bits
None Parity
1 stop bit
Hardware flow control.

Clicking the **Advanced** tab



It is possible to change the Com port number used to another number.

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Poor voice quality

We have experienced problems with the voice quality in the microphone handset.

The reason is that a new type of microphones, with different characteristics than the original, has during production been installed.

Our remedy for above has been a redesigned LF filter for the OP-Amp. in the Handset. But this is only done by T&T.

The remedy in the field is to replace the Handset.

This is not the final solution, as the voice quality is not as perfect as could be expected for a T&T product.

T&T is continuing the work for a satisfying solution.

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ACU reset - 15 sec

If for some reason a reset of the complete Fleet77/55 system is required, please be aware of the following.

The ACU in the antenna is equipped with capacitors in order to stabilize the DC power supply.

When powering down the BDU it can take up to 15 sec. before these ACU capacitors are fully discharged and a 100% reset is completed. It has been seen in some cases that if not fully discharged, they are able to keep alive some circuits of the ACU and the built-in GPS module. This will cause that the ACU and GPS is not being reset, reinitializing/rebooting the software.

If the Off/On of the BDU is done to quick the ACU capacitors might not have been completely discharged and the ACU has not been Off. This could also be an issue after a software upgrade.

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Relationship BDU -> Config Module -> ACU -> HPA

The Fleet77 and Fleet55 are using the same BDU (TT-3038C) and share the same SW.

Only when a Config Module is inserted into the BDU, an identity of the BDU is given.

Without the Config Module inserted, the BDU will not power On.

When inserting a Config Module into the BDU, and switching On, the Handset will ask for the Service User PIN code, in order to allow the use of the Config Module. This has been introduced to avoid fraud, by stealing a Config Module and insert it in the BDU. If no security was existing, calls could be performed and this on other users account.

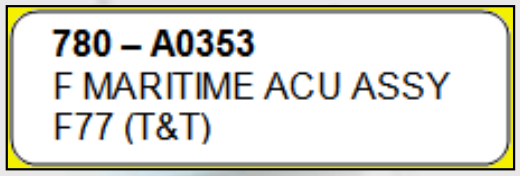
It will be the Service User PIN code of the Config Module that is requested, as the PIN codes are stored in the Config Module.

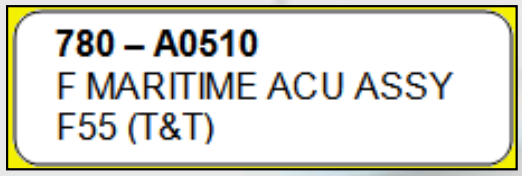
When the BDU has been given an identity, and being powered, it will start communication with the ACU. Here it will request the type of the ACU (F77 or F55), and if it does not match the system type of the Config Module an error message "**Antenna (ACU) Wrong Type Check Conf.**" is given, indicating that there is no correlation between Config Module and ACU.

So no matter the Config Module is wrongly installed the system is always informing that it is the antenna/ACU which is of the wrong type.

The physical appearances of the ACU are also alike for the Fleet77 and Fleet55, but are running different SW ver. Unfortunately it is not possible to interchange the ACU and then just upload the corresponding SW, also a hardware difference inside the ACU present. When the system has detected a mismatch between Config Module and ACU the error message "**Antenna (ACU) Wrong Type Check Conf.**" will be shown.

The ACU can physically be identified by a label positioned on the top near the LED. This label will state either:





Also the physical appearances of the HPA are alike for the Fleet77 and Fleet55, but have been adjusted for different gain and have different work tables. Inserting a wrong HPA into the system will unfortunately not give an error message, so it will run, but the performance could make the calls impossible or degraded.

The HPA can physically be identified by a label positioned next to the fan. This label will state either:

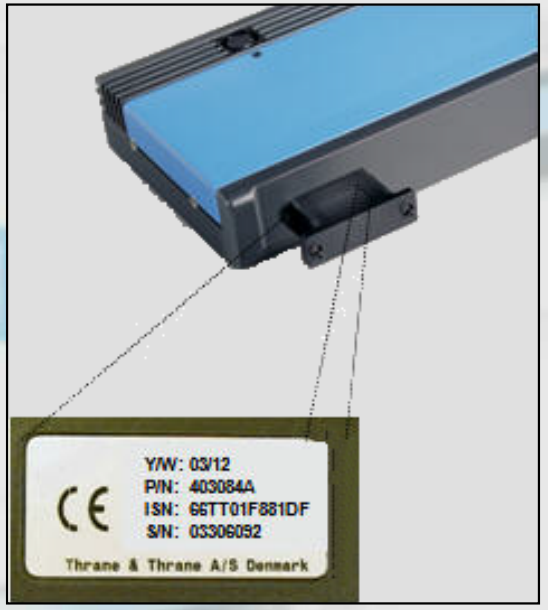
F77
Thrane & Thrane A/S
Denmark

F55
Thrane & Thrane A/S
Denmark

The Fleet77 was the first of the Fleet systems available, and was introduced in Q2 2002. Being the only type, it was not at that time a problem as all HPA's was for the Fleet77.

Approx. 1 year later the Fleet55 was introduced, and from that time an identification label was fitted both types of HPA.

The Config Module is the key to the whole system, therefore the label on this module, is including the system ISN and system T&T S/N and also the system production date.



This information can also be found in the Handset doing the following:

1. Press Menu.
2. Scroll down to "**Status**", press OK.
3. Scroll down to "**Transceiver**", press OK.
4. Scroll down to "**Serial no.**", read the next line for the T&T S/N.
5. Scroll down to "**ISN**", read the next line for Inmarsat S/N (ISN).
6. Press Exit 3 times.

All other labels indicating T&T S/N is only showing the serial number of the actual module, which we unfortunately can not crosscheck in our databases for a complete system S/N or ISN.

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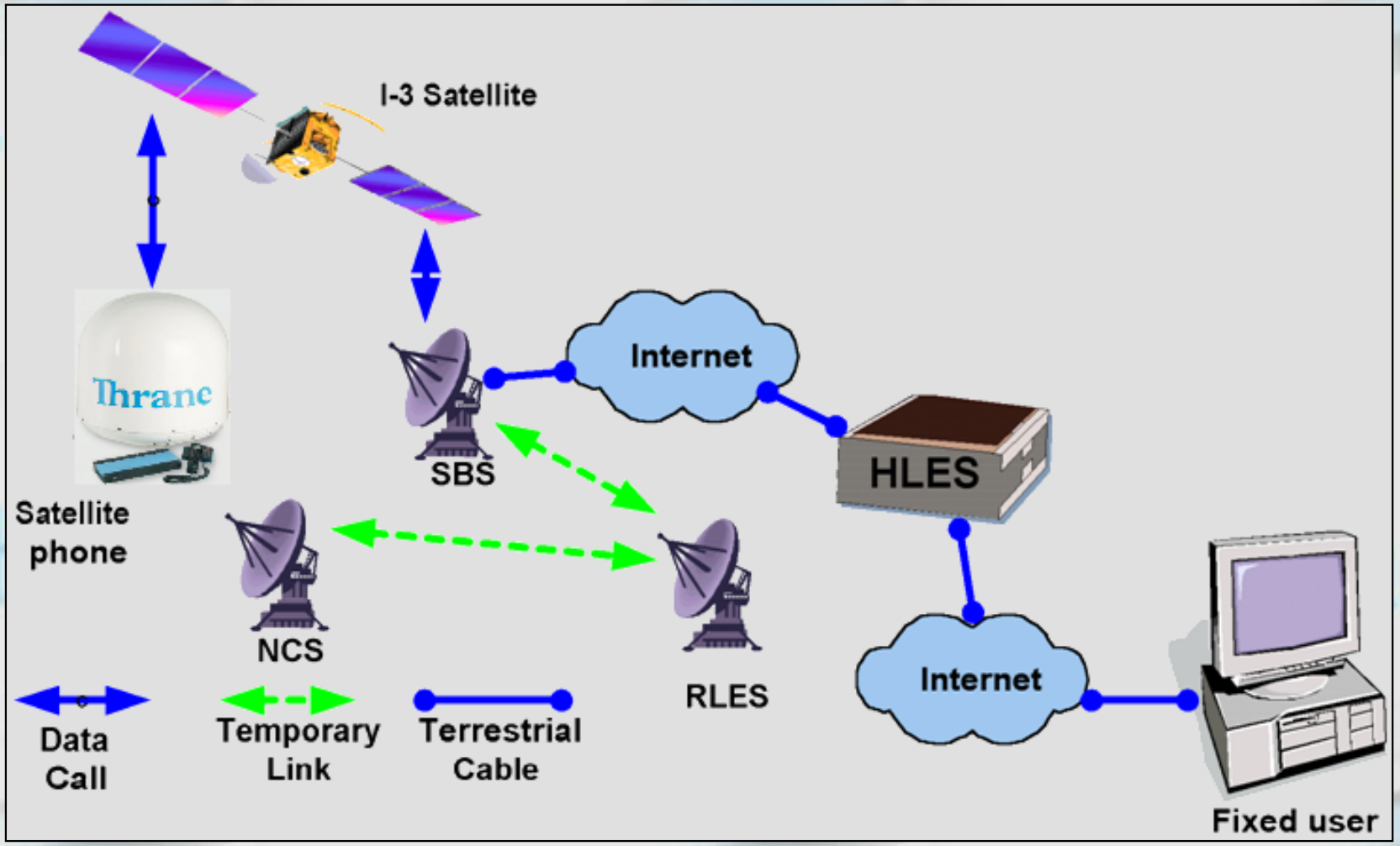
MPDS flow chart


I-3 Satellite
Thrane
Satellite phone
SBS
Internet
HLES
NCS
RLES
Internet
Fixed user
Data Call
Temporary Link
Terrestrial Cable

When using the MPDS services the Fleet terminal can be seen as a modem connecting e.g. a computer to the Internet using the packet switched technology.

The signal has to be routed in a slightly different way compared to the voice call. The user creates a PPP connection on the computer and uses the Fleet terminal as a modem.

1. The Fleet terminal sends a signal via the antenna to the satellite (blue arrow).
2. The satellite will forward this signal to the Satellite Base Station (SBS) (blue line).
3. The SBS will verify by Network Coordinating Station (NCS) via a Regional LES (RLES) (green line) that it is a registered user.
4. If the system is registered the SBS allocates a connection through the Internet to a Home LES (HLES) (blue line).
5. The HLES enables an internet connection to e.g. the corporate LAN or an Internet page.

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Can not make HSD calls (Speech, 3.1 KHz Audio or ISDN), but Mini-M voice/fax and MPDS is OK

It has been noted that in several ports around the globe, some of the services (Speech, 3.1 KHz Audio and ISDN) has not been working, while Mini-M voice and MPDS seems not to have been affected.

The failure message has in most of the cases been "**$12C4_h$**" or "**MES Time Out**". These two failure information has the following meaning:

"**$12C4_h$**": MES is clearing the call because the “authentication query” transmitted from the LES has not been received by the MES within the allowed time limit.
(Translated into clear text: The call from the MES has not been recognized by the LES, which then is not responding to the call. Therefore when time is out the MES gives this error message and clearing the call).

"**MES Time Out**": When the call has been initiated by the MES, it is waiting for a response from the LES ("authentication query"). If this message from the LES is not received within the specified time frame, the error message is shown.

The known ports (at this moment) are:

Rotterdam, Netherlands
Barcelona, Spain

Gouvia, Corfu, Greece
La Spezia, Italy
Vancouver, British Colombia, Canada
San Diego, California, USA
Philadelphia, Pennsylvania, USA
Miami, Florida, USA
Macaé, Brazil
Vitoria, Brazil

The problem has been identified as external interference, as whenever the vessels are leaving the port or area, all services are again fully functional.

Thrane & Thrane are working on a solution.

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Noise on Mini-M voice service – 64Kb Speech service is working OK

First of all directly comparing the Mini-M Voice and the 64Kb Speech service will always leave the Mini-M Voice somehow outperformed by the 64Kb Speech, due to the limited bandwidth provided of the Mini-M service. It will be to compare a music CD with the "old" record.

Eventually we have observed a few times where the Mini-M Voice quality is hardly understandable. Field experience in these cases has shown that the problem can be either a defective DLNA or BDU.

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Acronyms

ACU	Antenna Control Unit
ADU	Above Deck Unit
AZSA	Azimuth Zero Sensor Assembly
BDU	Below Deck Unit
BSM	Beam Steering Mechanism
BITE	Built In Test Equipment
C/No	Carrier to Noise Ratio of received signal in dBHz
DLNA	Diplexer Low Noise Amplifier
DSP	Digital Signal Processor
ESS	End Stop Switch
HPA	High Power Amplifier
FEU	Front End Unit (combined HPA/DLNA)
LED	Light Emitting Diode
PSM	Power Supply Module (supplying power to the HPA)
PSU	Power Supply Unit (build-in into the BDU)
RF	Radio Frequency
RSSI	Received Signal Strength Indication in dBm
RX2	Second Receiver
RX	Receive
SRA	Slip Ring Assembly
TX	Transmit

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PIN codes and Unblock PIN codes (PUK)

The Fleet 55/77 is delivered with two types of protection codes, PIN and PUK (Unblock PIN), pre-programmed. It is Service User and Super User PIN/PUK.

PIN codes can be altered to whatever is wanted (4 – 8 digits). In Service User area both Super User PIN and Service User PIN can be changed. Use following procedure:

1. Press Menu.
2. Scroll down to "**Service User**", press OK.
3. Enter ServiceUsr PIN, press OK.
4. Scroll down to "**PIN codes**", press OK.
5. If Service User PIN is the code that should be changed:

    a. Accept "**SeU-PIN Chg**" by pressing OK.
    b. Enter the new PIN code (4-8 digits), press OK.
    c. Retype the PIN, press OK.

d. Terminal accepts the new PIN code.

6. If Super User PIN is the code that should be changed:

   a. Scroll down to "**SU PIN**", press OK.
   b. Accept "**SU-PIN Chg**" by pressing OK.
   c. Enter the new PIN code (4-8 digits), press OK.
   d. Retype the PIN, press OK.
   e. Terminal accepts the new PIN code.

7. Press Exit 4 times.

In Super User area, only the Super User PIN code can be changed following this procedure:

1. Press Menu
2. Scroll down to "**Super User**", press OK.
3. Enter SuperUsr PIN, press OK.
4. Scroll down to "**PIN Codes**", press OK.
5. Accept "**SU-PIN Chg**", press OK.
6. Enter the new PIN code (4-8 digits), press OK.
7. Retype the PIN, press OK.
8. Terminal accepts the new PIN code.
9. Press Exit 3 times.

Please note that the Super User PIN and Service User PIN can not be entered identically when changing on the Handset, whereas when performing the change using FleetCP ver. 2.04, identical PIN codes is obtainable.

The PIN codes are identical by delivery of all systems from Thrane & Thrane, and are as default 12345678.

It is advisable to change these PIN codes, to block all others out from the protected areas.

The Unblock PIN codes can be found with the enclosed systems production certificate, page 2.

Note ! Even though the texture in centre of the page is stating "Super User Pincode" and "Service User Pincode", the top of the paper is defining that it is the "Unblock Pincodes".

These codes are normally not used except for opening up the system when an invalid Service User PIN or Super User PIN has been keyed in for more than three times in a row.

The first time at power up, the system will ask for the Service User PIN to allow the opening of the identity for this BDU. This will also be the case if the BDU is being replaced.

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Functional System Test

When the Fleet77 system is fully installed as described in this manual the system should be tested.

To perform the functional test the system needs to be commissioned by filling out following sections of the Inmarsat registration for service activation of Maritime Mobile Earth Station document:

Section 1 (Your details)
Section 2 (Paying the bill)
Section 3 (What type of MES are you registering)
Section 4 (What services are you applying for)
Section 5 (Fleet & SIM card services)
(**NOTE:** It is recommended to register all services)
Section 6 (Distress and safety/Emergency Contact Details)
Section 7 (To be completed for Maritime MES only)
Section 8 (Certification and agreement)

Send this form into your Service Provider, who then will register your system by Inmarsat. Without this registering the Fleet77 will not work.

Please also be informed that it could last 4 – 24 hours for Inmarsat to register the system worldwide.

You will from your Inmarsat Service Provider (ISP) receive a document informing you of all the Inmarsat Mobile Numbers (IMN) belonging to your Fleet77.

The function test:

1. Switch on the BDU by press and hold the ON/OFF switch until Handset Display, Handset LED's, Distress Cradle light and the BDU green power LED is lit. The Handset Display will after few seconds show "**Initialising**".
2. After "**Initialising**" the Handset Display will show one of the Ocean Regions (AORW:, AORE:, POR: or IOR:) and in the next row the texture "**Wait for NCS**", which means that the Fleet77 system is searching for a satellite.
3. When the Fleet77 system has found a satellite – this may take a few minutes – the Handset Display shows "**Ready**" and the bars for Signal strength will be shown, to indicate that the satellite has been found. Also the name of the LES chosen will be shown.
4. Thereafter the Handset Display shows "**Busy**" – this may take a few minutes – to indicate that the Fleet77 system are attempting to establish communication with the Network Coordinating Station (NCS) and working for getting a GPS-fix.
5. Again – this may take a few minutes – the Handset Display shows "**Ready**" and the bars for Signal strength will be shown. This time it will indicate

that the Fleet77 system has established the communication with NCS and are ready to make calls.

6. Make the set-up on the Fleet77 by entering the Menu structure of the Fleet77 by pressing the s pushbutton or use the FleetCP configuration program on a PC (see point 7).

   a. Scroll down to "**Service User**" and press OK.
   b. You will be prompted for the ServUsr PIN (Service User PIN code), enter that and accept on OK.
   c. Scroll further down to "**IMN Config**" and press OK.
   d. Enter MiniM voice by pressing OK.
   e. If a number is already given, press 2nd and up, and then press C to clear all previous digits.
   f. Now enter the MiniM voice number received from your ISP and accept by pressing OK.
   g. Do the same for all the other services (MiniM fax, Speech, 3.1KHz audio, 64 Kbit/s, 56 Kbit/s and MPDS).
   h. When completed, press Exit twice, scroll up to "**Super User**" and press OK.
   i. You will be prompted for the SuperUsr PIN (Super User PIN code), enter that and accept on OK.
   j. Scroll down to "**Routing**" and press OK.
   k. You will find all the connection ports as on the rear side of the BDU.
   l. Route the different services to a port as required, for Outgoing call by pressing "**#**" and/or for Incoming call by pressing "*****", accept on OK and press Exit.
   m. Do this set-up for all ports.
   n. Press Exit three times to exit the Menu structure.

7. Make the set-up of the Fleet77 using FleetCP configuration program on a PC:

   a. Insert the Thrane & Thrane “TT-10227A Capsat® Fleet77” CD-ROM, in your Windows PC. The program will automatically open a window. In the left hand side of the window you will find these buttons:

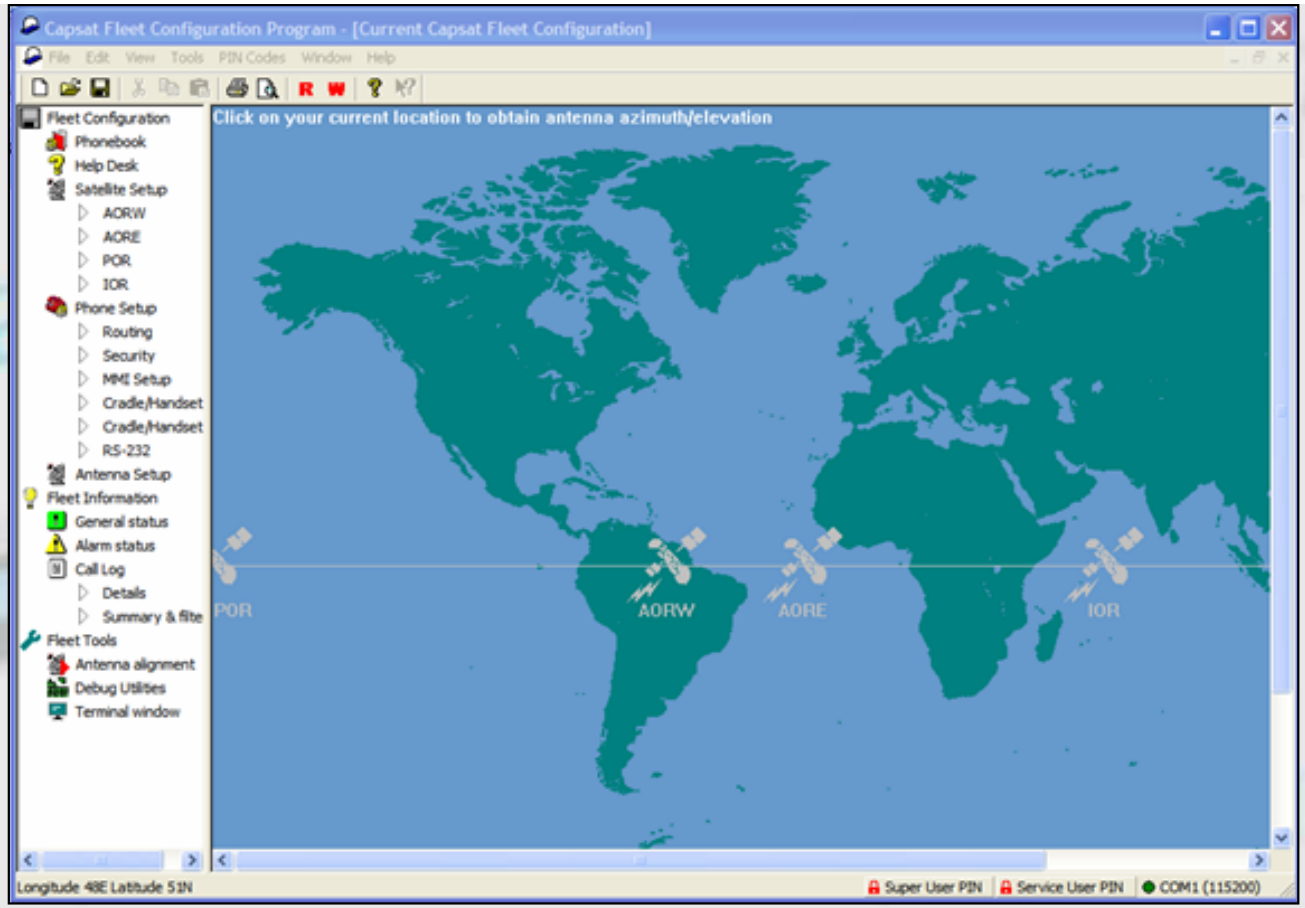
b. Press the button

   This will open the Setup in the Microsoft Internet Explorer-window.

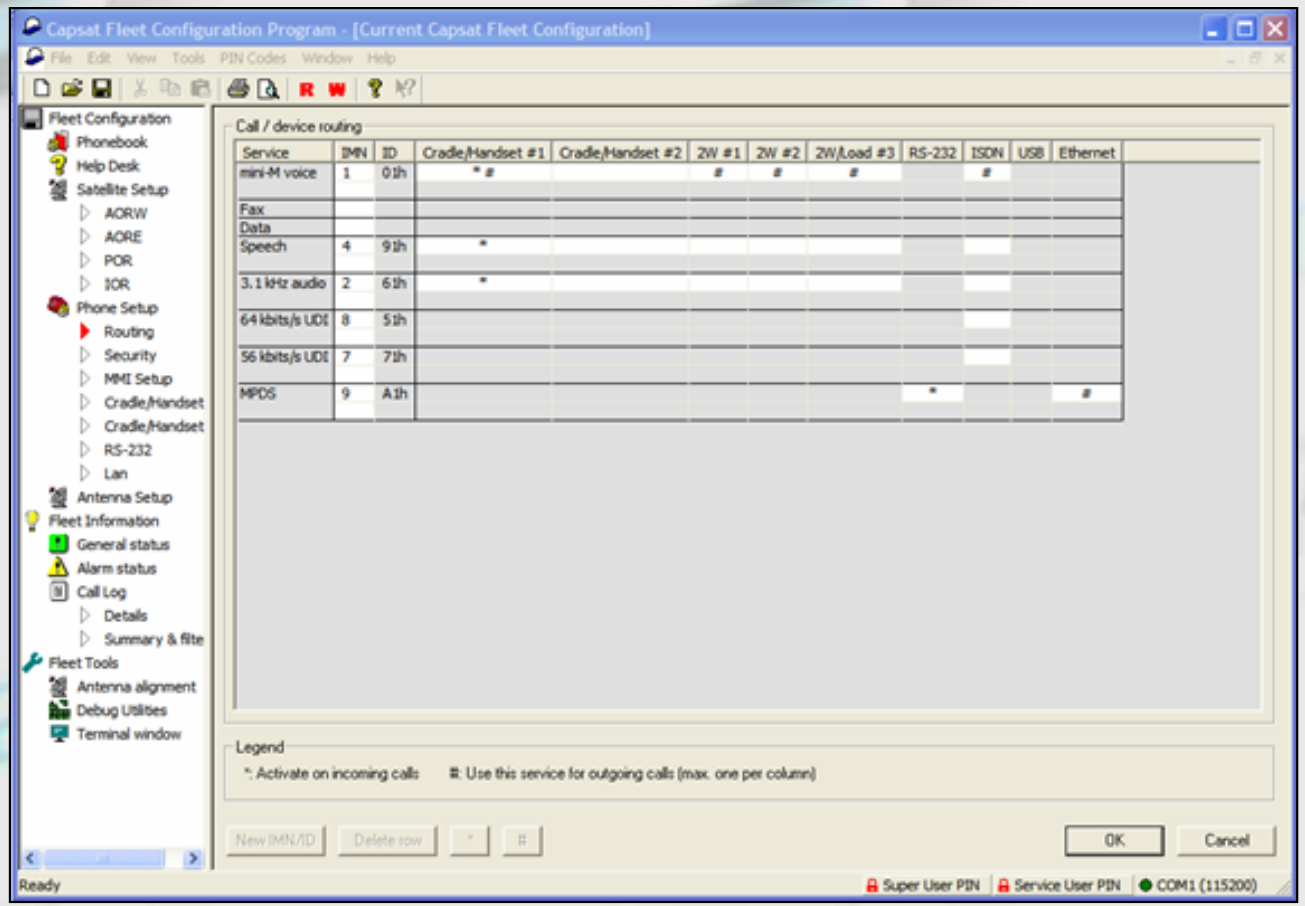
c. Double-click the "**setup.exe**" icon.

d. The program will now install the "**FleetCP204**" and make a new icon on the desktop.

e. Connect the PC to the Fleet77 using a "serial straight line cable" to the "**X9 RS-232 Control**" port at the rear side of the terminal. Double-click the FleetCP204 icon to open the "FleetCP" configuration program as seen below:



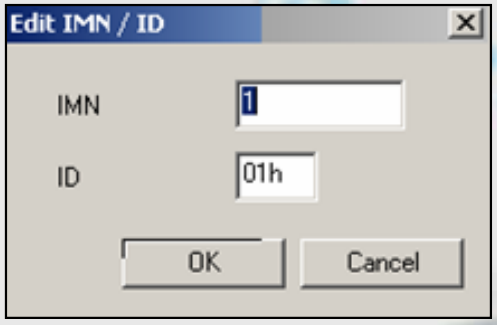
f. Click "**Routing**" under "**Phone Setup**".



g. In the spreadsheet above right-click in the IMN column in the line of each service, a button "**Edit IMN / ID**" will be shown.
Click that button and the edit window will be opened.
Enter the IMN given by your ISP, by overwriting the existing number shown below. Keep the ID given. Click the "**OK**" button to accept.

Call / device routing

Service	IMN	ID
mini-M voice	1	01h
Fax		
Data		
Speech	4	91h
3.1 kHz audio	2	61h
64 kbits/s UDI	8	51h
56 kbits/s UDI	7	71h
MPDS	9	A1h

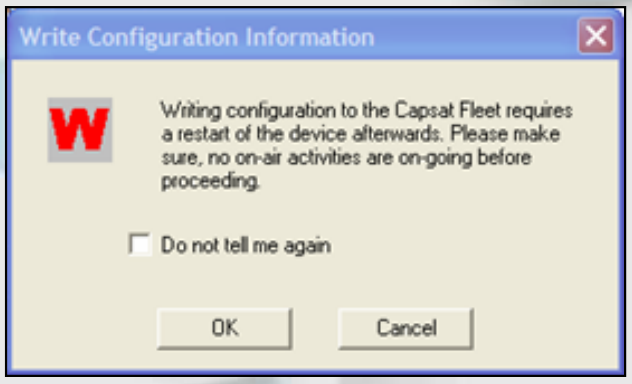


h. When all IMN's has been entered, start routing the services for the different ports. Mark in the spreadsheet below the service and port and press "*" for incoming calls and "#" for outgoing calls.

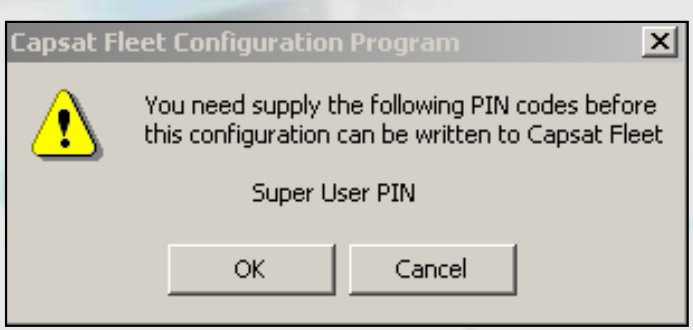
Call / device routing

Service	IMN	ID	Cradle/Handset #1	Cradle/Handset #2	2W #1	2W #2	2W/Load #3	RS-232	ISDN	USB	Ethernet
mini-M voice	762585235	01h	* #			#					
	762585236	02h	*								
Fax	762585237	11h									
Data											
Speech	600164310	91h	*						*		
3.1 kHz audio	600164311	61h	*		* #						
64 kbits/s UDI	600164314	51h							* #		
	600164315	52h									

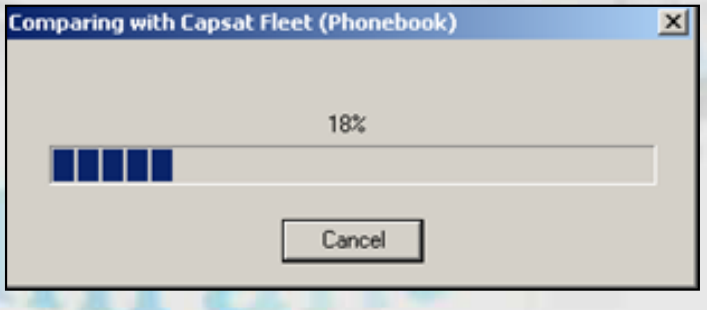
i. Press the "**W**" in the menu list to write the set-up into the Fleet77 terminal. To take the new information into operation, the Fleet77 has to be reset.
This is accepted by pressing the "**OK**" button.



j. As data are uploading to areas protected by both Super User PIN code (Routing) and Service User PIN code (IMN Config), the program will prompt for both PIN codes before each data group will be downloaded.



k. Press "**OK**" button, and enter the respectively PIN code, as asked. The download will then pass into the Fleet77.



8. Connect all the necessary additional equipment to the ports according to the routing of the Fleet77.

9. Make a call from and to the Fleet77 on all the available services, one-by-one.

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Distress Test

A Distress Test is made to test the Distress call system. When the LES/RCC (Rescue Coordination Centre) receives the call, a flag in the message will be set, so that the LES/RCC can identify the call as a test call.

Follow the Distress Test procedure below:

1. Make the set-up on the Fleet77 by entering the Menu structure of the Fleet77 by pressing the Menu.
    a. Scroll down to "**Super User**" and press OK.
    b. Enter the "**SuperUsr PIN**" code.
    c. Scroll down to "**DistressTest**" menu and use up or down and OK to "**Enable**" the distress test.
    d. The display on the handset will show "**Distress Test Enabled**" and the yellow "**Distress Test LED**" will start flashing.
    e. The Distress test mode remains active in 30 seconds, after which it automatically disables the test again.

f. While the distress test is enabled, press the Distress button on the cradle for 5 seconds or until the light on the button stops flashing and the buzzer stops beeping.

g. After 15 seconds all ongoing calls will be pre-empted.

h. Alist of distress LES's is presented in the handset display. Use up or down and OK •to select a LES. If a LES is not selected within 15 seconds, the pre-configured LES will be selected instead.

i. The handset display will now go from "**Distress calling**" to "**Distress connected**" as the call progresses.

    1. "**Distress connected**" also means that the test was a success.

j. To abort the test call press Offhook/Onhook or wait 120 seconds, after which the call will automatically be disconnected.

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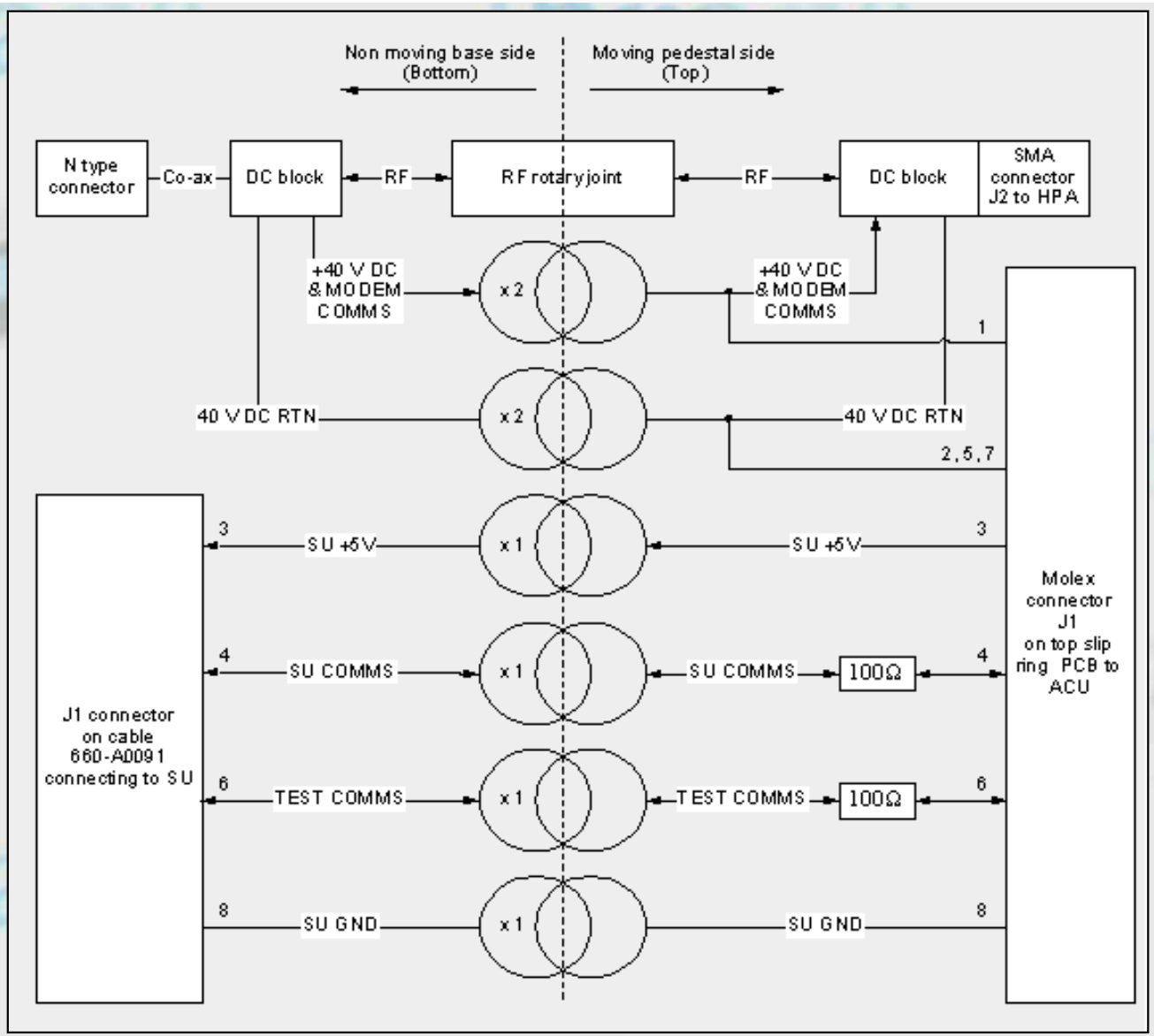
Slip ring continuity test

This test checks for DC continuity and short circuits of the slip rings. A schematic diagram of the different slip ring connections is shown below. DC resistance is measured between the different test points as indicated in the Table below. In the event of intermittent failures, the slip ring should be rotated during the measurement.


Non moving base side
(Bottom)
Moving pedestal side
(Top)
N type connector
Co-ax
DC block
RF
RF rotary joint
RF
DC block
SMA connector J2 to HPA
+40 V DC & MODEM COMMS
x 2
+40 V DC & MODEM COMMS
1
40 V DC RTN
x 2
40 V DC RTN
2,5,7
J1 connector on cable 660-A0091 connecting to SU
3
SU +5V
x 1
SU +5V
3
4
SU COMMS
x 1
SU COMMS
100Ω
4
6
TEST COMMS
x 1
TEST COMMS
100Ω
6
8
SU GND
x 1
SU GND
8
Molex connector J1 on top slip ring PCB to ACU

NC = not connected		Inner conductor of N-type connector external to antenna	Outer conductor of N-type connector external to antenna	Connector J1 of cable 660-A0091 connecting to SU			
				Pin 3	Pin 4	Pin 6	Pin 8
Inner conductor of TNC connector to HPA		0 W	NC	NC	NC	NC	NC
Outer conductor of TNC connector to HPA		NC	0 W	NC	NC	NC	NC
Connector J1 on top of Slip rings	Pin 1	0 W	NC	NC	NC	NC	NC
	Pin 2	NC	0 W	NC	NC	NC	NC
	Pin 3	NC	NC	0 W	NC	NC	NC
	Pin 4	NC	NC	NC	100 W	NC	NC
	Pin 5	NC	0 W	NC	NC	NC	NC
	Pin 6	NC	NC	NC	NC	100 W	NC
	Pin 7	NC	0 W	NC	NC	NC	NC
	Pin 8	NC	NC	NC	NC	NC	0

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Antenna interconnecting cable pin definition

Cable 660-A0091

Between SU and slip ring bottom:

CABLE P/N 660-A0091 CONNECTOR PINOUTS							
SIGNAL	DIRECTION	J1	J2			TWISTED PAIRS	COLOURS
						REFERENCE TO J2	
+5V_SU		3	7			6+7	ORANGE
SU_COM	BI	4	4			4+5	GREEN
AUX_COM	BI	6	5				BLUE
+5V_SU_RET		8	6				GREY

Cable 660-A0092

Between slip ring top and ACU:

CABLE P/N 660-A0092 CONNECTOR PINOUTS					
SIGNAL	DIRECTION	J1	J2	TWISTED PAIRS	COLOURS
40V		1	1	1+2	RED
40V RET		2	2	4+6	BLACK
SU_5V		3	3	3+8	ORANGE
SR_CON	BI	4	4		GREEN
AUX_CON	BI	6	6		GREY
SU_GND		8	8		BLUE

Cable 660-A0093

Between ACU and elevation motor and end stops:

CABLE P/N 660-A0093 CONNECTOR PINOUTS								
SIGNAL	DIRECTION	J1	J2	J3	J4	J5	J6	COLOURS
EL_A		8						RED
EL_B		2						GREEN
EL_A!		7						BLUE
EL_B!		1						BLACK
+5V		4	4					ORANGE
0V		3	1					GREY
0V		5					1	GREY
0V		6			1			BLACK
EL_OEA		10	3					YELLOW
EL_OEB		9	2					VIOLET
EL_ES+		12		1				RED
EL_ES-		11				1		BLUE

Cable 660-A0094

Main cable between ACU and antenna beam (around bobbin):

CABLE P/N 660-A0094 CONNECTOR PINOUTS							
SIGNAL	DIRECTION	J1	J2	J3		TWISTED PAIRS	COLOURS
						REFERENCE TO	J1
SQNT_A		1	1			1+3	RED
SQNT_B		2	2			2+4	GREEN
SQNT_A!		3	3			5+6	BLUE
SQNT_B!		4	4			7+9	BLACK
SQNT_OEA		5	5			8+11	VIOLET
SQNT_OEB		6	6			13+14	YELLOW
5V_SQNT_OE		7	7			15+17	ORANGE
5V_RX2		8	8			16+18	ORANGE
0V_SQNT_OE		9	9				GREY
0V_HPA_FEU		10		3			GREY
0V_RX2		11	11				GREY
RX2_1PPS		12	12				RED
RX2_RXD		13	13				BLACK
RX2_TXD		14	14				ORANGE
HPA_RXD+		15		1			RED
HPA_TXD+		16		4			YELLOW
HPA_RXD-		17		2			BLUE
HPA_TXD-		18		5			GREEN
FEU_RXD_TTL							
FEU_TXD_TTL							

Cable 660-A0153

Between ACU and azimuth motor and azimuth zero reference:

CABLE P/N 660-A0153 CONNECTOR PINOUTS					
SIGNAL	DIRECTION	J1	J2	J3	COLOURS
AZ_A		8			RED
AZ_B		2			GREEN
AZ_A!		7			BLUE
AZ_B!		1			BLACK
+5V		4	4		ORANGE
0V		3	1		GREY
+5V		6		4	ORANGE
0V		5		1	GREY
AZ_OEA		10	3		YELLOW
AZ_OEB		9	2		VIOLET
AZ_ZERO		12		2	RED
AZ_DIR		11		3	BLACK

Cable 660-A0163

Between hybrid PCB and DLNA:

CABLE P/N 660-A0163 CONNECTOR PINOUTS					
SIGNAL	DIRECTION	J1	J2		COLOURS
+5VDC		1	2		RED
GND		2	1		BLACK

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HPA ribbon cable pin definition

PSM CONN.	HPA CONN.	SIGNAL	COLOURS
1	1	GND	RED
2	2	28/16 VDC → HPA	GREY
3	3	GND	GREY
4	4	28/16 VDC → HPA	GREY
5	5	GND	GREY
6	6	28/16 VDC → HPA	GREY
7	7	GND	GREY
8	8	40 VDC → PSM	GREY
9	9	40 VDC → PSM	GREY
10	10	40 VDC → PSM	GREY
11	11	GND	GREY
12	12	40 VDC → PSM	GREY
13	13	GND	GREY
14	14	5 VDC ANALOGUE	GREY
15	15	GND	GREY
16	16	5 VDC ANALOGUE	GREY
17	17	GND	GREY
18	18	5 VDC DIGITAL	GREY
19	19	GND	GREY
20	20	POWER SET	GREY
21	21	POWER SET	GREY
22	22	POWER SET	GREY
23	23	GND	GREY
24	24	HPA SET	GREY
25	25	GND	GREY
26	26	BLOWER SET	GREY

Power Set:	0 – 0 – 0	28 VDC
	1 – 1 – 1	16 VDC

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Cradle cable pin definition

SUB-D-15 PIN	HARWIN PIN	SIGNAL	COLOURS
1	1	AUDIO OUT HI	WHITE
2	2	AUDIO OUT LO	BROWN
3	3	AUDIO IN HI	GREEN
4	4	AUDIO IN LO	YELLOW
5	5	+28 VDC	GREY
6	6	GND	PINK
7	7	SDA	BLUE
8	8	SDB	RED
SHIELD	9	GROUND	SHIELD
SHIELD	10	GROUND	SHIELD

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Cause Codes

Cause Code	Description of cause
0 0 0 0	Unspecified. Typically this occurs if the MES times out while registering. Please observe that the rightmost LED on the handset is turned on while the display says "MPDS mode Registering"
0 0 0 1	Data connection released by SBS
0 0 0 2	MES de-registered by SBS
0 0 0 3	MES rejected by the SBS
0 0 1 1	The Idle timer in the MES expired and the MES either de-registered or released the data connection

0 0 1 6	The maximum connection timer expired and the MES either de-registered or released the data connection
0 0 9 0	Satellite link was interrupted and the MES de-registered itself from the MPDS network
0 0 9 1	The MES did not find opportunity to register with the MPDS network
0 0 F 0	The MES did not get any response on its attempts to register with the MPDS network
0 0 F 1	Data connection establishment did not succeed
1 0 0 1	MES is clearing the call as instructed by the relevant MES terminal equipment (i.e., normal clearing due to MES terminal "on-hook" etc.)
1 0 1 1	MES is rejecting the call because the specified MES terminal number is currently busy, and MES has not been authorized to divert calls which are addressed to that number
1 0 1 2	MES is clearing the fixed-originated call because subsequent to the acceptance of the call and the signaling of the identity of the mobile terminal to which the call will actually be routed, that terminal has become busy and hence cannot be rung
1 0 2 1	MES is clearing the call because appropriate "off-hook" signaling has not been received from the addressed MES terminal (including any authorized diversions) within the allowed time limit
1 0 8 1	MES is rejecting the call because the specified MES terminal number has not been installed, and MES has not been authorized to divert calls which are addressed to that number
1 0 9 1	MES is rejecting the call because the specified MES terminal number is currently out-of-service, and MES has not been authorized to divert calls which are addressed to that number
1 0 9 2	MES is clearing the fixed-originated call because subsequent to the acceptance of the call and the signaling of the identity of the mobile terminal to which the call will actually be routed, that terminal has become out-of-service and hence cannot be rung
1 1 4 1	MES is clearing the call because the call has been pre-empted by an MES user instruction to establish a higher priority call from the MES

1 1 4 2	MES is prematurely clearing the fixed-originated call which is in the process of being established because the MES user has initiated a higher priority call
1 1 4 3	MES is prematurely clearing the fixed-originated call which is in the process of being established because the MES user has initiated a call from a terminal which is authorized to automatically pre-empt an existing fixed-originated call
1 1 4 4	MES is prematurely clearing the MES-originated call which is in the process of being established because the MES user has initiated a higher priority call
1 1 4 5	MES is prematurely clearing the mobile-originated call which is in the process of being established because the MES user has initiated a call from a terminal which is authorized to automatically pre-empt an existing mobile-originated call
1 1 4 6	MES is prematurely clearing the mobile-originated call which is in the process of being established because the MES user has abandoned the call (by placing the originating terminal "on-hook")
1 1 9 1	Call rejected, MES outside coverage of spot beam
1 1 A 0	LES is clearing the call because the credit card being used is not valid (at this LES) for calls to the country indicated in the "service address" information received from the MES
1 1 D 1	LES is rejecting the call because the "Service Nature" and/or "Service Type" and/ or "Channel parameter" information received from the MES is invalid (e.g., not currently defined in the SDM, mutually contradictory, or not applicable to a MES originated call)
1 1 D 2	LES is clearing the call because the "service address" information received from the MES is invalid (i.e., less than 2 digits)
1 1 D 3	LES is clearing the call because the "service address" information received from the MES is a 2-digit address which is either undefined or which is currently unavailable at this LES
1 1 D 4	LES is clearing the call because "credit card data" information received from the MES is invalid. [This does not imply that the credit card itself is invalid]

1 1 D 5	LES is clearing the call because the "service address" information received from the MES contains a country code which is regarded (by this LES) as invalid
1 1 D 6	LES is clearing the call because the "PID" information received from the MES in the "scrambling vector" message (type 8DH) is not consistent with the PID information in the Fixed/MES Originated (PID) and PID/MES Registration Tables at the LES as it relates to this call
1 1 D 7	Call rejected, invalid service for Priority 1 or 2 call
1 1 D 8	Call cleared, dialed number not 2 or 3 digits for Priority 1 or 2 call
1 1 E 0	LES is clearing the call because the credit card PIN received from the MES is not considered (at this LES) to be valid
1 1 E 1	LES is clearing the call because it has been determined that an excessive number of consecutive call attempts with invalid credit card PIN's have been made
1 2 0 2	(Spot Beam Handover): MES is ready to make the transition from the current beam to the next beam
1 2 6 2	Call cleared, MES time-out (Distress Test exceeded 120s)
1 2 8 1	MES is rejecting the call because the MES is not equipped to provide the specified service
1 2 9 1	MES is rejecting the call because although it is equipped to provide the specified service, it is not currently able to do so
1 2 B 1	MES is rejecting or clearing the call for a reason which is not covered by any of the currently defined "Cause" events
1 2 C 2	MES is clearing the call because a "credit card valid" message (type A7H) has not been received by the MES within the allowed time limit
1 2 C 3	MES is clearing the call because a "LES Connect" message (type 8CH) has not been received by the MES within the allowed time limit
1 2 C 4	MES is clearing the call because the "authentication query" ISU message (type B4H) and/or the "authentication query" SSU message (type B5H) have not been received by the MES within the allowed time limit
1 2 C 5	MES is clearing the call because an expected supplementary services SU(s) has (have) not been received by the MES within the allowed time limit

1 2 C 6	MES is clearing the call because the "supplementary services interrogation" ISU (type B2H), and/or "subscriber digits" SSU (type AD H) messages have not been received by the MES within the allowed time limit
1 2 C 7	MES is clearing the call because a "SCPC channel release" SU (type 8A H) has not been received by the MES, in response to the transmission of a "notification acknowledge" message (type BAH) during the supplementary services call diversion information retrieval process, within he allowed time limit
1 2 C 8	(Spot Beam Handover): MES is clearing the call session in the next beam because the MES did not detect the LESH carrier on the new frequency
1 2 D 1	LES is rejecting the call because the "spot-beam ID" information received from the MES is invalid (i.e., ID is not allocated on satellite in use)
1 2 D 2	LES is clearing the call because the "Scrambling Vector" information received from the MES is invalid (i.e., 0000H, 6959H or 7FFFH)
1 3 5 1	MES is clearing the call because the MES currently has insufficient free memory in which to store the short message
1 3 6 1	MES is clearing the call because the Above-decks equipment is about to "cable unwrap"
1 3 6 2	MES is clearing the call because a long-term interruption in reception has occurred (the definition of a "long-term interruption" depends upon the service type, see Section B)
1 3 6 3	A Secondary Functional Centre of a Multi-channel MES is clearing the call because the Primary Functional centre has commanded the Above-decks equipment to re-point to a different Ocean Region
1 3 9 1	MES is clearing the call because the call has lasted more than 700 km in linear traveled distance. (Used for Aero Class MES only)
1 3 9 2	MES is clearing the call because it has moved out of spot beam coverage
1 3 9 3	Aeronautical Class MES only: MES in "cooperative mode" is clearing the call because of a preemption request from the master entity

1 4 5 1	LES is rejecting the call because an appropriate terrestrial circuit is not currently available at this specific LES
1 4 5 2	LES is rejecting the call because an appropriate channel unit and associated terrestrial circuit are not currently available at this LES. [This "cause" is only utilized when there is a permanent "one-to-one" connection between appropriate channel units and their terrestrial circuits]
1 5 0 2	(Spot Beam Handover): LES is ready to make the transition from the current beam to the next beam and is clearing the call session in the current beam (normal clear)
1 5 5 1	LES is rejecting the call because an appropriate satellite channel is not currently available at this specific LES
1 5 8 1	LES is rejecting the call because the requested service is not provided by this specific LES
1 5 9 1	LES is rejecting the call because the requested service is temporarily not available at this specific LES
1 5 9 2	LES is clearing the call because the specified credit card type is not currently supported by this specific LES
1 5 A 1	LES is rejecting the call because the specified MES is not authorized for any service at this specific LES
1 5 A 2	LES is rejecting the call because the specified MES is not authorized to use specific requested service via this specific LES
1 5 A 3	LES is clearing the call because the "credit card data" information received from the MES has been rejected by the credit card authorization process
1 5 A 4	LES is clearing the call because the data received from the MES in the "authentication reply" message (type B6H) has been declared "invalid" by the LES authentication process
1 5 A 5	LES is rejecting the call because the specified PID is not authorized for any service at this specific LES
1 5 A 6	LES is rejecting the call because the specified PID is not authorized to use specific requested service via this specific LES
1 5 A 7	Call cleared, dialed number illegal for Priority 1 or 2 call

1 5 B 1	LES is rejecting or clearing the call for a reason which is not covered by any of the currently defined "Cause" events
1 5 C 1	LES is rejecting the call because an appropriate "Channel Assignment" message has not been received by the LES within the allowed time limit
1 5 C 2	LES is clearing the call because the "service address" information has not been received by the LES within the allowed time limit
1 5 C 3	LES is clearing the call because a "Scrambling Vector" message (type 8DH) has not been received by the LES within the allowed time limit
1 5 C 4	LES is clearing the call because neither the "service address" information nor a "Scrambling Vector" message (type 8DH) has been received by the LES within the allowed time limit
1 5 C 5	LES is clearing the call because the complete "credit card data" information has not been received by the LES within the allowed time limit
1 5 C 7	LES is clearing the call because a "MES Connect" message (type 99H) has not been received by the LES within the allowed time limit
1 5 C 9	LES is clearing the call because a "authentication reply" message (type B6H) has not been received by the LES within the allowed time limit
1 5 C A	LES is clearing the call because a "notification acknowledge" message (type BAH) has not been received by the LES within the allowed time limit
1 5 C B	LES is clearing the call because the request sequence number contained in the received "notification acknowledge" message (type BA) is not valid (i.e. either not ‘0’ or not the next value in the sequence)
1 5 C C	(Spot Beam Handover): LES is terminating the procedure because it did not receive a response to the Handover Request from the NCS
1 5 C D	(Spot Beam Handover): LES is clearing the call session in the next beam because the MES did not indicate that it was ready to make the transition (possibly because the MES did not receive the Channel Assignment)

15D1	LES is rejecting the call because the "Channel Assignment" message received from the NCS contains inappropriate or conflicting information
15D2	LES is clearing this MES ID and channel number in the busy lists at LES and NCS because a new call to/from this MES is being set-up (and thus any previous call to/from this MES must have cleared)
15E1	LES is attempting to clear an MES which has sent an SCPC channel release message but is found still to be transmitting 5.12 s later
1651	LES is rejecting the call because an appropriate channel unit is not currently available at this specific LES
1661	LES is clearing the call because of an interruption in reception of the MES carrier exceeding the allowed time limit
16C2	LES is clearing the call because an appropriate SCPC MES carrier has not been received by the LES (at the commencement of the call) within the allowed time limit
16C3	(Spot Beam Handover): LES is clearing the call session in the next beam because the LES did not detect the MESH carrier on the new frequency
1790	LES is clearing the call because of a malfunction in the credit card validity checking database or in the communications links thereto
1791	LES is clearing the call because of a malfunction in the authentication checking database or in the communications links thereto
1811	NCS is rejecting the call because the specified MES ID is in the "MES busy" list at the NCS
1812	NCS is rejecting the call because the specified MES is busy with an IPDS call at the NCS
1813	NCS is rejecting the call because the specified MES is busy with an IPDS call at the NCS, and the call waiting notification was declined or timed out by the MES
1814	NCS is rejecting the call because the specified MES is busy with an IPDS call at the NCS, and call waiting notification is unavailable
1841	NCS is pre-empting the call in order to free the MES for an incoming call with priority 1

1 8 4 2	NCS is pre-empting the call in order to free the MES for an incoming call with priority 2
1 8 4 3	NCS is pre-empting the call in order to free the MES for an incoming call with priority 3
1 8 4 4	NCS is pre-empting the call in order to assign the channel to another call with higher priority
1 8 5 1	NCS is rejecting the call because an appropriate SCPC channel is not currently available
1 8 5 2	NCS is rejecting the call because no SCPC channel exists at the NCS which matches the contents of the Channel Parameters, Service Nature, Service Type, MES Category, Spot Beam ID and Priority fields contained in the Request for Channel Assignment
1 8 5 3	NCS is rejecting the call because no SCPC channel is currently available for the specified lease marked MES
1 8 5 4	NCS is rejecting the call because the MES is outside the spot beam coverage area
1 8 5 5	NCS is rejecting the call because an appropriate SCPC channel is not currently available and channel pre-emption failed
1 8 5 6	NCS is rejecting the call because the requested spot beam indicates failed spot beam selection ("FF") and an appropriate global SCPC channel is not currently available
1 8 5 7	(Spot Beam Handover) NCS is rejecting the Handover Request because an appropriate SCPC channel is not available in the next beam
1 8 A 1	NCS is rejecting the call because the specified MES ID was not found in the "Forward and Return MES ID" cross-reference table
1 8 A 2	NCS is rejecting the call because the specified MES is not authorized for any service (except for Distress calls) at the NCS
1 8 A 3	NCS is rejecting the call because the specified LES is not authorized for the requested service at the NCS
1 8 B 1	NCS is rejecting or clearing the call for a reason which is not covered by any of the currently defined "Cause" events
1 8 B 2	NCS is rejecting the call because the requested service variant is invalid

1 8 C 1	NCS is rejecting the call because no message was received from the specified MES (in reaction to a Call Announcement message) within the allowed time limit
1 8 C 3	NCS is rejecting the call because the specified MES was busy and the MES pre-emption failed (i.e. no response within the allowed time limit)
1 8 D 1	NCS is rejecting the call because the Request for Call Announcement or Request for Channel Assignment contains invalid or inappropriate information
1 8 E 1	NCS is rejecting the call because the specified MES ID is in the "MES busy" list at the NCS, and is listed as being busy with a call through the same LES as that now requesting a "call announcement" addressed to that MES
1 8 E 2	NCS is rejecting the call because the specified MES is busy with an IPDS call through the same LES which is requesting the call announcement
1 8 E 4	NCS is rejecting the call because the specified MES is busy with an IPDS call through the same LES which is requesting the call announcement, and the call waiting notification was declined or timed out by the MES
1 8 E 5	NCS is rejecting the call because the specified MES is busy with an IPDS call through the same LES which is requesting the call announcement, and call waiting notification is unavailable
1 C 5 1	Call rejected, terrestrial network congestion
1 F 0 1	LES is clearing the call because of the receipt of "on-hook" signaling from the relevant terrestrial circuit (i.e., normal clearing)
1 F 1 1	LES is clearing the call because the terrestrial called party is engaged (busy)
1 F 2 1	LES is clearing the call because appropriate "off-hook" signaling from the terrestrial called party has not been received by the LES within the allowed time limit
1 F 6 1	LES is clearing the call because of the detection of a failure in the relevant terrestrial circuit

1 F 6 2	The LES is clearing the call because the terrestrial calling party or the terrestrial network has cleared the call before the "MES connect" message has been received by the LES

Back to Handset Messages

SW changes BDU

TT-3084A SERIES Capsat Fleet77, software-changes from version 1.00 to 1.01

1. Correcting the too often "mirroring" of set-up data from BDU to Config Module, even though set-up data has not been changed. Now "mirroring" is only made when a change in set-up is performed.

TT-3084A SERIES Capsat Fleet77/55, software-changes from version 1.01 to 1.02

1. Mini-M fax capability.
2. Call Log accepts up to 500 entries.
3. Alarm in handset before overwriting Call Log.
4. BDU automatically resets after configuration upload from FleetCP.
5. Error message for main voltage drop below 20 VDC.
6. LES names can be edited and/or reset to default.
7. LES names have been updated.
8. TNID (Terrestrial Network ID) removed from LES menus.
9. SW is common for both Fleet77 and Fleet55.
10. HPA SW improved.

TT-3084A SERIES Capsat Fleet77/55, software-changes from version 1.02 to 1.03

1. Quick automatic start of sky scan if antenna has been blocked while call was in progress.
2. Remove Mini-M fax selections from menus in Fleet55.
3. Bug corrections.

TT-3084A SERIES Capsat Fleet77/55, software-changes from version 1.03 to 1.04

1. Alarm when antenna cable RF loss is critical.
2. Drift of antenna during a MPDS session, when satellite signal is short time blocked, has been cured. When satellite signal becomes available again, antenna tracks and the MPDS session are continued.
3. Alarm beep when an alarm occurs.
4. Alarm Log is stored in the memory of the terminal, and is not disappearing by power off.
5. Manually delete is now needed.
6. RJ11 volume setting. 2nd and 8 (speaker) function during a call is activated.
7. MPDS access able when Allowed dial is used, even though MPDS number is not inserted in the allowed dial list.
8. LES names can be edited and/or reset to default (corrected).
9. Bug correction.

TT-3084A SERIES Capsat Fleet77/55, software-changes from version 1.04 to 1.05

1. Alarm when 2 or more values of IQ calibration are all 0's (0000_h), which could indicate poor or no IQ calibration has been stored.
2. A menu entry for displaying the IQ calibration has been inserted in the Service User area.
3. A menu entry for performing and storing an IQ calibration has been inserted in the Service User area. The alarm when antenna cable RF loss is critical has been moved from the Alarm Log, and will not lit the red Alarm LED, and has been replaced by a Status info point under the Antenna-FEU. The information is given as %-loss of max. (100% loss is critical – HPA has compensated maximum).
4. All 16 digits of the Main Board PCB S/N are displayed in Status.

TT-3084A SERIES Capsat Fleet77/55 software-changes from version 1.05 to 1.06

1. A menu entry for performing the MO adjustment has been inserted in the Service User area.

TT-3084A SERIES Capsat Fleet77/55 software-changes from version 1.06 to 1.08

Please note that version 1.07 has been used by Thrane & Thrane as a test version and have not been officially released.

1. A better stability of High-speed Data call. Previously Cause Code 12B1 has been seen as being a problem.
2. MPDS call is now only possible when the Fleet system is reporting Ready in the Handset display. Meaning that without Sync and/or without GPS fix, no MPDS call is possible. Previously the end user was not prevented to make MPDS call at any reason.
3. Better indication when an alarm is present. The Handset display will show "System alarm view log" and the red alarm LED will light.
4. New and better alarm and warning descriptions are shown in the Handset display. There will also be given a possible solution to the problem.
5. Active alarms will always be in the top of the alarm log.
6. A Warning Log is introduced in the Super User menu.
7. Automatic HPA SW (ver. 1.02) upload will be performed if a mismatch is detected. The BDU will every time it is switched on check the HPA for SW version. If incorrect HPA SW, upload will start and "FEU Upload" will be displayed in the Handset.
8. Uploading SW to RX2 and ACU via the BDU now possible.
9. Changes in ISDN routing have been made. Now you can select incoming and outgoing calls separately, where previous you had to make both. You also have to route ISDN data, which previously did not matter.

10. PABX selection in RJ11 Setup under Super User can now be made.
11. The audio will follow, if a call is made while the Handset is in the cradle, and during the call setup process the Handset is lifted.
12. Alarm Log has been removed from the main menu.

TT-3084A SERIES Capsat Fleet77/55 software-changes from version 1.08 to 1.09

1. Contains a new HPA SW (ver. 1.03) which supports both the “old” and “new” microprocessor of the HPA. The existing “old” microprocessor of the HPA has gone out of production. Automatically upload to the HPA will take place when BDU SW ver. 1.09 is uploaded.

Back to General

SW changes ACU

Software-changes from version 2.09 to 2.15 (F77) and version 2.09 to 1.05 (F55)

1. Reduced number of times that the GPS engine are reset from 3 to 2 , resulting in three intervals of 4:55 minutes before declaring critical GPS acquisition failure.
2. Hardware reset of GPS engine on start-up of ACU, followed by a reset command to the GPS engine to clear GPS RAM.
3. Declaration of critical GPS navigation failure if GPS fails to navigate for more than 15 minutes.

Software-changes from version 2.15 to 2.16 (F77) and version 1.05 to 1.06 (F55)

1. The ACU will ignore the GPS data while any value (E.G. heading, speed over ground, latitude, longitude, time) is out of bounds, where previous versions would have flashed a “GPS communication failure” message after 20 sec. invalid data received.
2. An additional test is included, to check that both the hard and soft reset of the GPS engine occurs on start-up and whenever the GPS engine is reset. This is to check that the hard reset hardware and the serial command interface hardware are working correctly. If either the hard or soft reset does not happen, the ACU will retry three times to reset the engine and then raise a warning. Warning is “Incomplete GPS initialisation”.

Back to General

SW changes RX2

Software-changes from version 3.05 to 3.08

1. Better stability in the RSSI calculation.
2. Better reduction of noise and increased accuracy when calculating tracking errors.

Back to General

Find latest SW

The latest SW version for BDU, HPA, RX2 and ACU can always be found and downloaded from our Extranet at:

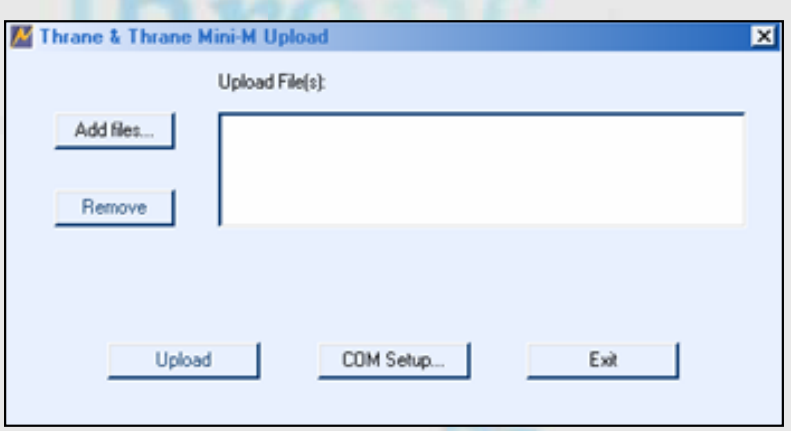
http://www.tt.dk/extra/aftersales/software.asp

Extract the ZIP-file(s) to a location on the hard drive of your own choice.

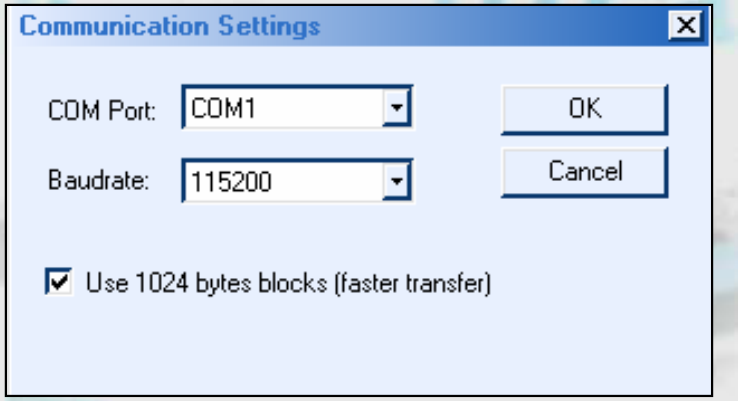
Back to General

SW upload BDU

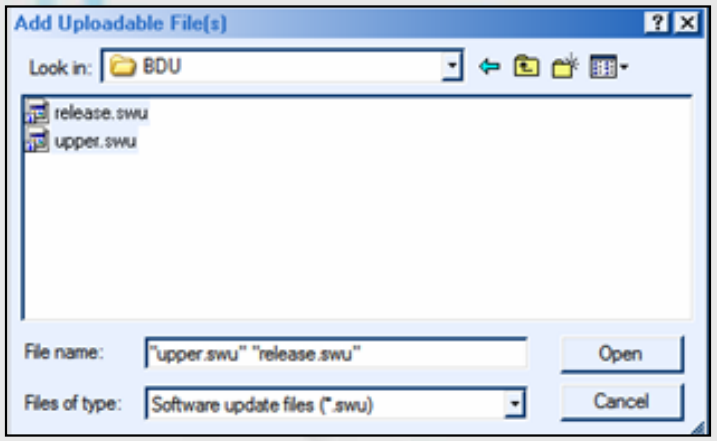
1. Connect the X9 port of the BDU and the COM port of the PC/Laptop with a RS232E (serial “straight line”) cable.
2. Run the MMUpload.exe



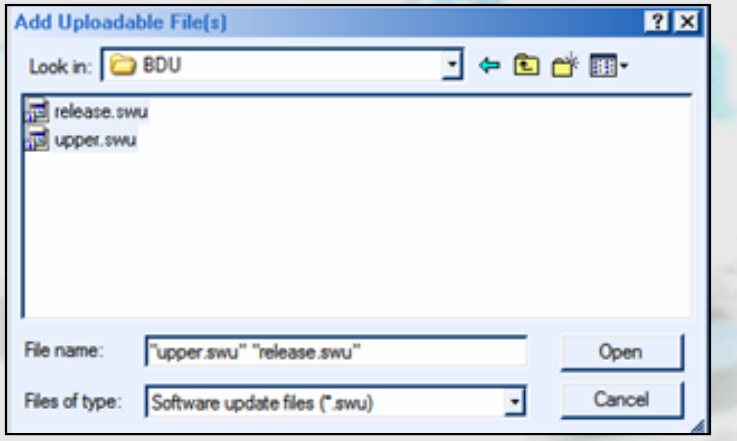
3. The window opened to set up the COM port selection and speed [COM Setup…] (it has been seen, that if the upload fails, it helps to lower the baud rate from 115200)



and the selection of the files to upload [Add files…]. Find the BDU SW files to upload (release.swu and upper.swu) from the location where they was stored on the hard drive of your PC/Laptop).

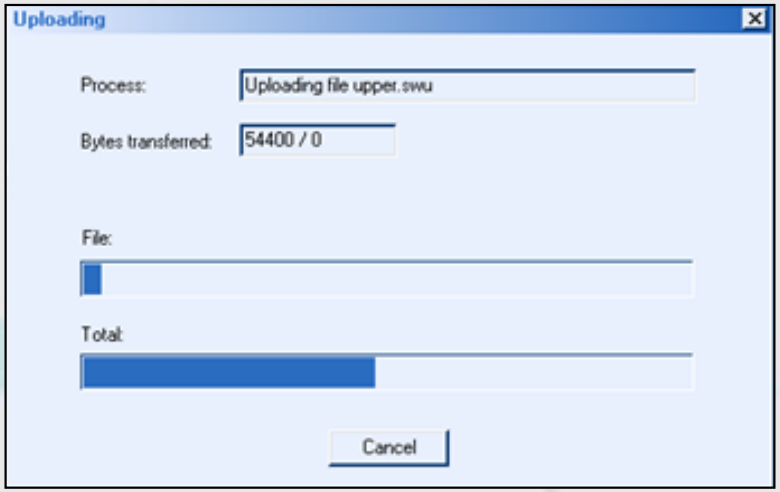


Accept on “**Open**”.

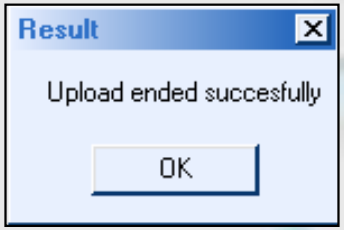


4. If the BDU is switch On at this point, please switch Off the Fleet77/55, as the upload will only take place while the Handset writes Initializing, and this state can only be achieved by power On.

5. Now press [Upload] to start the process of uploading the two files to the BDU will be performed. When the “Total bar” is fully extended, the download process is finished, and a verifying window will open.



6. Press the [OK] button to close.



Back to General

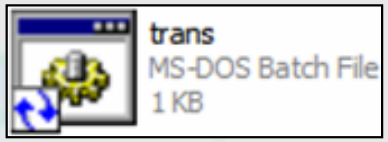
SW upload RX2 and ACU

The SW upload can only be done if the RX2 is of the new type (P/N: 88-119568-A). Old type (P/N: 88-117530-A) can not be SW updated.

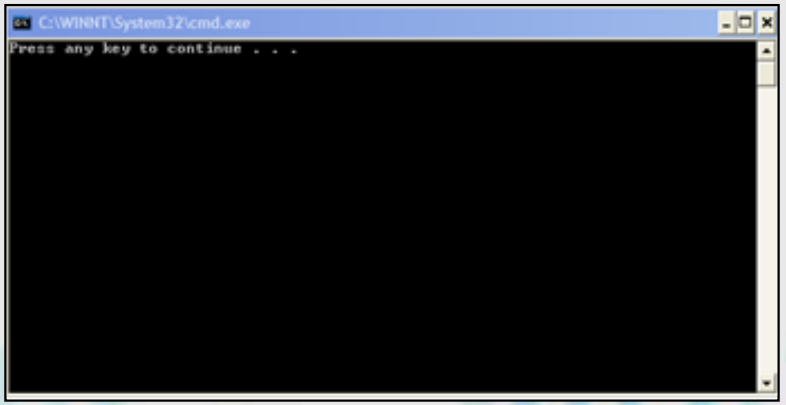
1. Connect the X9 port of the BDU and the COM port of the PC/Laptop with a RS232E (serial “straight line”) cable.

2. Make sure that the BDU is SW updated to ver. 1.08 or later.
    a. Press Menu.
    b. Scroll down to "**Status**", press OK.
    c. Scroll down to "**Transceiver**", press OK.
    d. Scroll down to "**SW Ver.**".
    e. Verify next line.
    f. Press Exit three times.

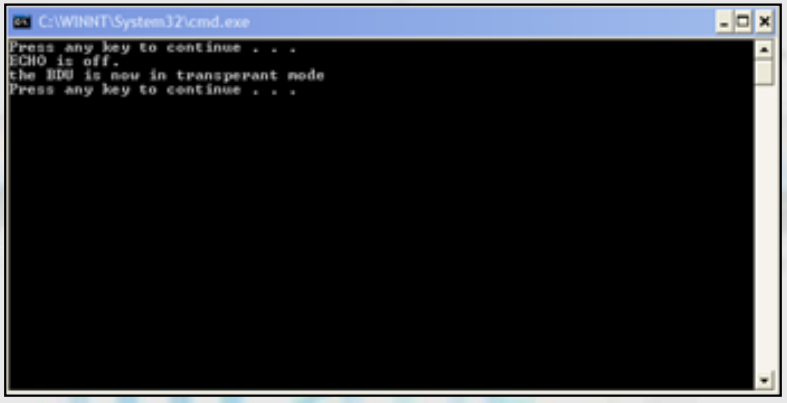
3. The upload of SW to the RX2 will automatically also upload SW to the ACU, and is performed through the BDU.
4. Prepare the upload to the antenna modules through the BDU by lowering the baud rate (communication speed) to 19200 bps.
    a. Press Menu.
    b. Scroll down to "**Super User**", press OK.
    c. Enter the SuperUsr PIN code, press OK.
    d. Scroll down to "**Data Setup**", press OK.
    e. Accept "**Baud Rate**" by pressing OK.
    f. Scroll down to "**19200**", press OK.
    g. Press Exit three times.

5. Run the trans.bat 

6. An executive program is now running, and is prompting "**Press any key to continue…**", do so.

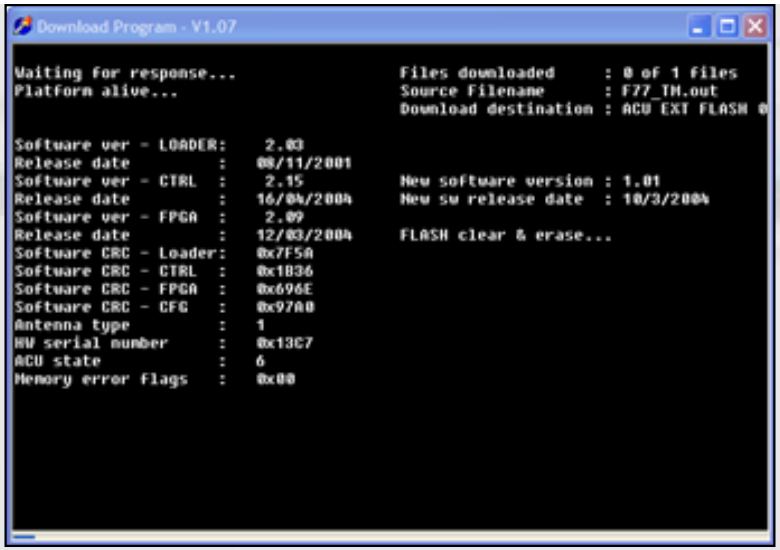


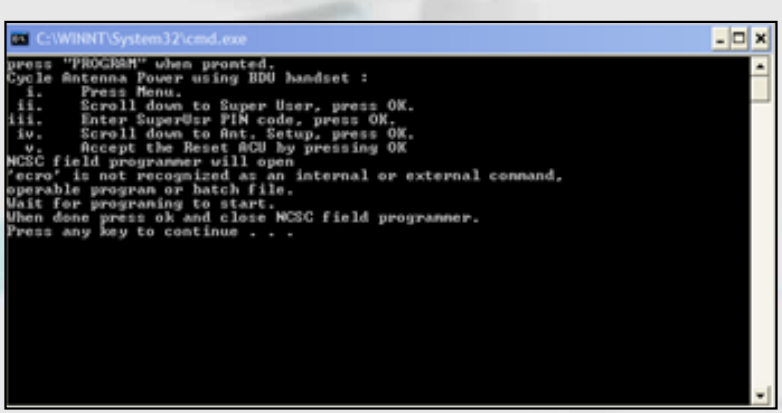
7. The BDU will now be put into "transparent mode" and again the executive program will prompt "**Press any key to continue…**", do so.



8. A window "Download Program V1.07" is opened, and an "ACU to RX2" upload program is loaded into the ACU, so that the RX2 SW can be transferred from BDU via ACU to the RX2.

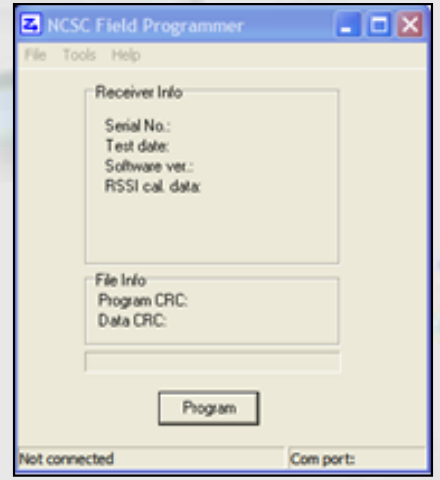
8. When the message "**Download complete**" is shown, close the window.



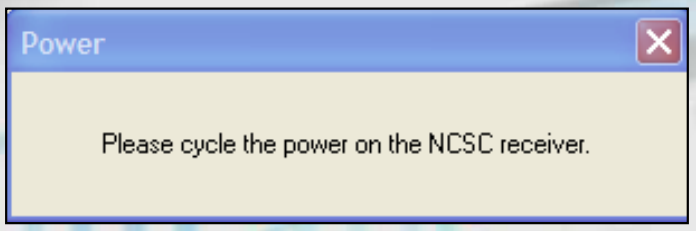


10. The executive program will again prompt "**Press any key to continue…**", do so.

11. When the "NSCS Field Programmer" is opened, press the [Program] button.

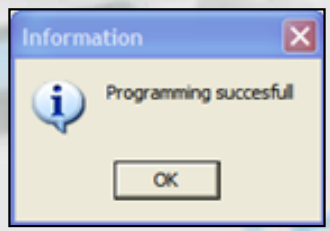


12. The process will start by asking for a NCSC reset. Do an ACU reset in the Handset.
    a. Press Menu.
    b. Scroll down to "**Super User**", press OK.
    c. Enter the SuperUsr PIN code, press OK.
    d. Scroll down to "**Ant. Setup**", press OK.
    e. Accept the "**Reset ACU**" by pressing OK.

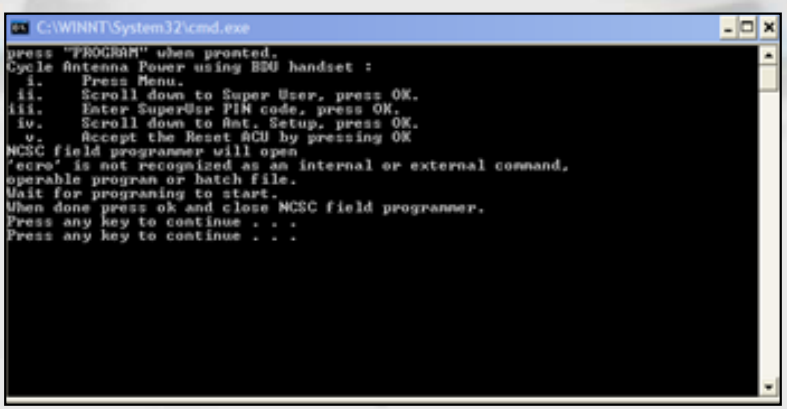


13. Wait for the upload to be performed.
    NOTE ! If the SW upload to the RX2 is interrupted while the progress bar is shown, the RX2 can not be re-uploaded and have to be returned the Thrane & Thrane.

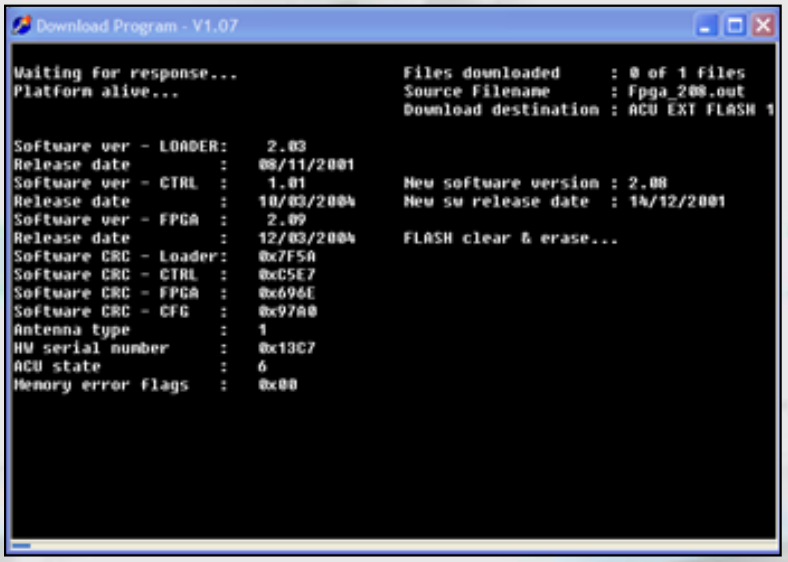
14. When the upload is done, press OK and close the "NCSC Field Programmer" window.
    The RX2 SW is now uploaded and the process will continue the uploading the ACU SW.



15. The executive program will again prompt "**Press any key to continue…**", do so.

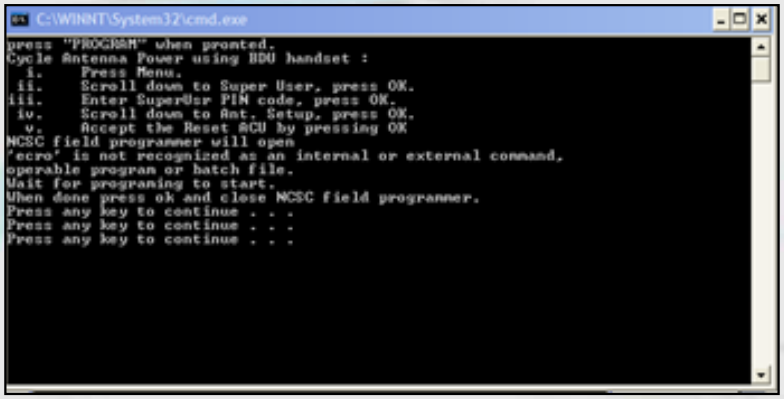


16. Again the window "Download Program V1.07" is opened, and a new loader program is uploaded to the ACU, so that the actual ACU SW can be uploaded.

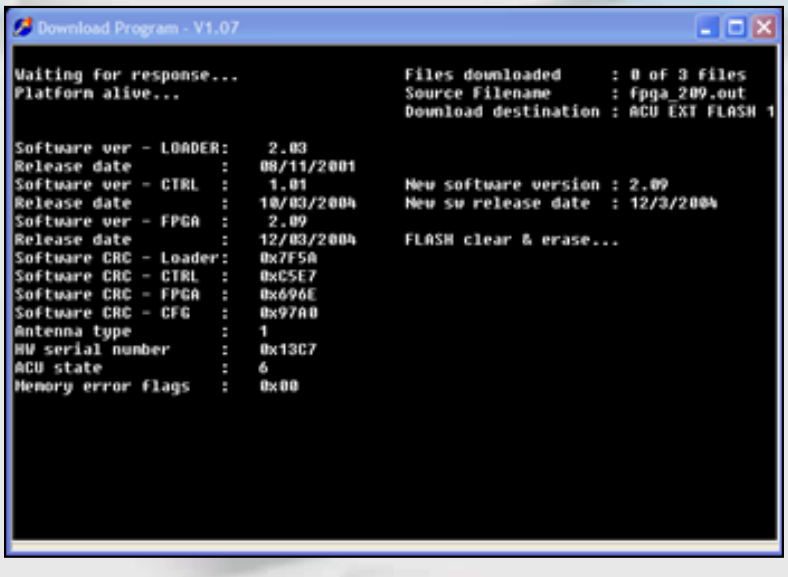


17. When the message "**Download complete**" is shown, close the window.

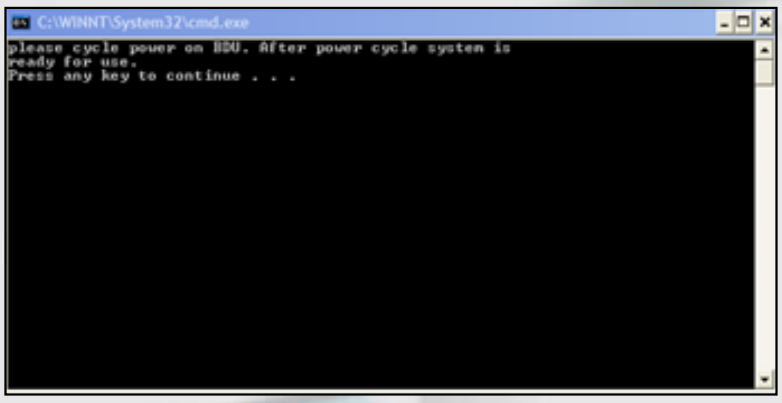
18. The executive program will again prompt "**Press any key to continue…**", do so.



19. A new window of "Download Program V1.07" is opened, and the ACU SW is automatically uploaded in 3 files.



20. When the message "**Download complete**" is shown, close the window.



21. The executive program will this time prompt "**please cycle the power on BDU. After power cycle system is ready for use**" do so.

22. Verify SW version in the RX2 and the ACU:
    a. Press Menu.
    b. Scroll down to "**Status**", press OK.
    c. Scroll down to "**Antenna**", press OK.
    d. Scroll down to "**ACU**", press OK.
    e. Scroll down to "**Control Ver.**".
    f. Verify next line shows latest ACU SW version no.
    g. Scroll further down to "**RX2 Ver.**".
    h. Verify next line shows latest RX2 SW version no.
    i. Press Exit four times.

23. Bring back the baud rate to 115200 bps, following the procedure under step 4.

Back to General

SW upload ACU

If the RX2 is of the old type (P/N: 88-117530-A) a RX2 SW update can not be performed.

The ACU SW update then has to be done following this procedure:

1. Connect the X9 port of the BDU and the COM port of the PC/Laptop with a RS232E (serial “straight line”) cable.

2. Prepare the ACU for uploading ACU SW from the PC/Laptop through the BDU.

    a. Lowering the baud rate (communication speed) between BDU and ACU to 19200 bps.
        i. Press Menu.
        ii. Scroll down to "**Super User**", press OK.
        iii. Enter the SuperUsr PIN code, press OK.
        iv. Scroll down to "**Data Setup**", press OK.
        v. Accept "**Baud Rate**" by pressing OK.
        vi. Scroll down to "**19200**", press OK.
        vii. Press Exit 3 times.

    b. Open the Antenna Diagnostic Software.
        i. Open Files and select Option.
        ii. Check/or select the COM port selection is the PC/Laptop COM port to which the BDU is attached.
        iii. Check /or select the COM port Baud rate to 19200 bps.
        iv. Check/or tag the BDU Connected.
        v. If corrections are made, press OK. If no corrections are made, press Cancel.

    c. Set the BDU into "transparent mode" by pushing the button [PC-Ant Comms Test] in the Antenna Diagnostic Software.

    d. Await the "**Communication ok**" statement, accept on OK.

    e. Exit the Antenna Diagnostic Software window.

3. Run the "new F77 (F55) total ACU_SW_test.bat". Within this bat file it has been specified to run via PC/Laptop COM port 1. If it is wanted to alter to another COM port, it is the statement –c1 = COM port 1 (-c2 = COM port 2, -c3 = COM port 3 …..).

4. During the upload of SW, the ACU RxD and ACU TxD LED on the ACU will be flashing to indicate proper communication between ACU and BDU.

5. When the "**Download Complete**" is shown, close the download window.

6. Power Off the Fleet77/55 system and wait for minimum 15 sec before powering On again.

7. Verify SW version in the ACU:

a. Press Menu.
b. Scroll down to "**Status**", press OK.
c. Scroll down to "**Antenna**", press OK.
d. Scroll down to "**ACU**", press OK.
e. Scroll down to "**Control Ver.**".
f. Verify next line shows latest ACU SW version no.
g. Press Exit 4 times.

8. Bring back the baud rate to 115200 bps, following the procedure under step 2a.

Back to General

IQ calibration

Since BDU SW version 1.05 a Calibration menu point has been introduced in the Service User area.

To verify IQ calibration values, please follow the procedure given:

1. Upload the BDU SW ver. 1.05 or later, or check the SW version present in the BDU:
   a. Press Menu.
   b. Scroll down to "**Status**", press OK.
   c. Scroll down to "**Transceiver**", press OK.
   d. Scroll down to "**Sw Ver.**"
   e. Verify next line.
   f. Press Exit 3 times.
2. Press Menu.
3. Scroll down to "**Service User**", press OK.
4. Enter ServiceUsr PIN code, press OK.
5. Scroll down to "**Calibration**", press OK.
6. Scroll down to "**IQ-const**", press OK.
7. In Modulator, press OK.
8. Read (e.g.):

IAmp 7FF3h
QAmp 7FFFh
IOff 0087h
QOff 0247h
Phase FFC7h

9. Press Exit.
10. Scroll down to "**Demodulator**", press OK.
11. Read (e.g.):

IAmp 7FFFh
QAmp 7FFFh
IOff 0000h
QOff 0000h
Phase 0000h

12. Press Exit 5 times.

The above example given, the 0000h, is indicating that the IQ calibration is not performed or not stored correctly or drifted.

To IQ calibrate and save the calibration, please do the following:

1. Upload the BDU SW ver. 1.05 or later, or check the SW version present in the BDU:
   a. Press Menu.
   b. Scroll down to "**Status**", press OK.
   c. Scroll down to "**Transceiver**", press OK.
   d. Scroll down to "**Sw Ver.**".
   e. Verify next line.
   f. Press Exit 3 times.
2. Press Menu.
3. Scroll down to "**Service User**", press OK.
4. Enter ServiceUsr PIN code, press OK.

5. Scroll down to "**Calibration**", press OK.
6. Select "**IQ-calib**", press OK.
7. By the request "**Perform IQ Calibration?**" press OK.
8. Display will now show "**Calibrating Wait…**". Note : The calibration can take up to 10 minutes to perform.
9. After calibration the Handset display will shortly show "**Done**" and thereafter the system will reset.

Note ! If the Handset display shows "**Failed Try again**", the calibration has failed and the calibration procedure has to be performed again.

If the terminal constantly fails the calibration procedure (not likely), the terminal has to be returned for further process at T&T.

After the calibration, please verify the IQ values as described above.

If two values of the IQ calibration are 0000, having uploaded the SW ver. 1.05 or later, an alarm will be raised and the Alarm LED is lit. In the Alarm Log the alarm message is saved until the Alarm Log is deleted. Please remember that all alarm messages will be deleted in one operation. To delete the Alarm Log, procedure is as follows:

1. Press Menu.
2.
3. Scroll down to "**Super User**", press OK.
4. Enter Super User PIN code, press OK.
5. Scroll down to "**Alarm**", press OK.
6. Scroll down to "**Clear log**", press OK.
7. By the request "**Delete all ?**" press OK.
8. Display will now show "**Alarm Log All Cleared**".
9. Press Exit 3 times.

Back to Tests and Adjustments

MO Adjustment

Since BDU SW version 1.06 a MO (master oscillator) adjustment point under the Calibration menu point in the Service User area has been introduced.

If or when the Freq. Offset and Acc. Offset of RF block are out of spec, the MO Adjustment has to be performed.

The procedure of checking the Offset is as follows:

1. Press Menu.
2. Scroll down to "**Status**", press OK.
3. Scroll down to "**RF block**", press OK.
4. Scroll down to "**Freq Offset**", read the Hz value.
5. Scroll down to "**Acc. Offset**", read the Hz value.
6. Press Exit 3 times.

To perform the MO adjustments do as follows:

1. Upload the BDU SW ver. 1.06 or later, or check the SW version present in the BDU:
   a. Press Menu.
   b. Scroll down to "**Status**", press OK.
   c. Scroll down to "**Transceiver**", press OK.
   d. Scroll down to "**SW Ver.**".
   e. Verify next line.
   f. Press Exit 3 times.
2. Press Menu
3. Scroll down to "**Service User**", press OK.
4. Enter ServiceUsr PIN code, press OK.
5. Scroll down to "**Calibration**", press OK.

6. Scroll down to "**MO-adjust**", press OK.

7. Scroll down to "**Ocean Region**", press OK.

8. This starts the adjustment with the message "**MO-adjust f.ofs +0**".

9. When the adjustment has been performed the message is "**MO-adjust Done**".

10. Press Exit 3 times.

Back to Tests and Adjustments

RX2 Comm error

If the communication between the RX2 and ACU is failing, this error message "**RX2 Comm error**" will be shown. Often it has also been seen that a following error message "**ACU Comm. Failure**" will be given.

By running the Antenna Diagnostic Program, Warnings & Errors, directly at the RS-232 port of the SU, a more duly information can be given, whether it is the ACU is failing in communication or it is only the RX2 communication.

The cause of failure could be the following:

1. RX2 is provided 5 VDC from the ACU via the Hybrid and Squint PCB. Please check the connection of the ribbon cable in both ends.
2. The RF signals from the DLNA are passed on to the RX2 via the brown coax cable. Please check that the cable is connected properly to the DLNA.
3. A defective RX2.

The RX2 is a non repairable item. If the error message continues please replace the RX2.

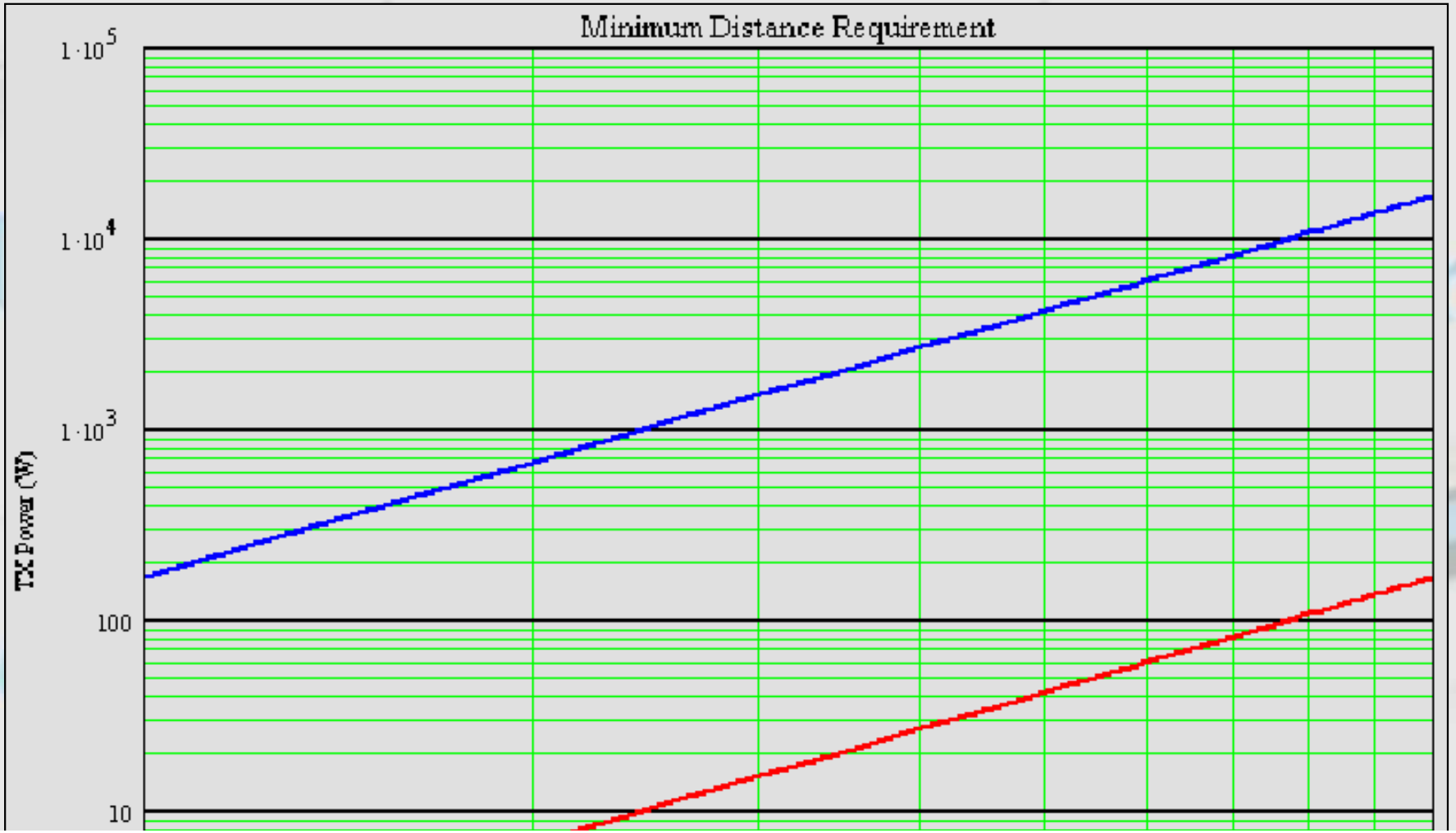
Back to Handset Messages

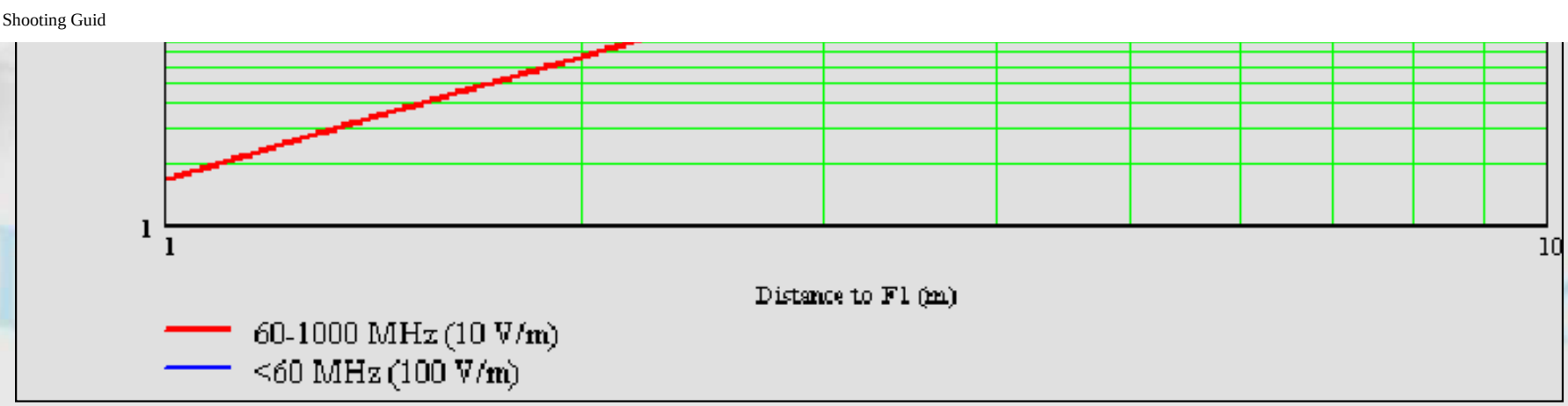
Interference

When installing the Fleet 77/55 antenna there is a risk of RF interference from other transmitters and radars onboard the vessel. Therefore, these guidelines should be taken in consideration when placing/mounting the antenna, e.g.:

1. Distance to VHF antennas (for VHF's with 25W transmitting power) should be approx. 3 m.
2. Distance to MF/HF antennas (for MF/HF systems with transmitting power of 150W), should be approx. 1 m.

Please observe if the output power vary from the above-mentioned examples, the distance to the transmitting antennas can be in- or decreased accordingly to the table shown in graph below:

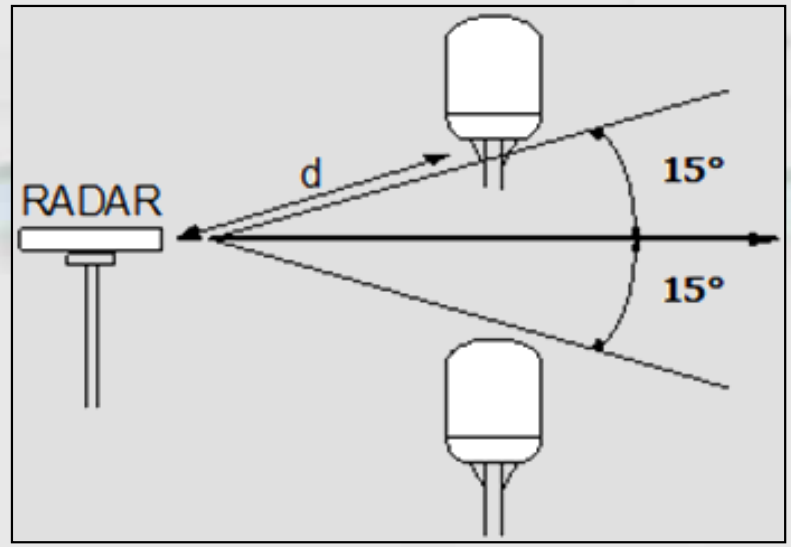




The distance to radar scanners, should be preferably be as shown in spreadsheet below:

Radar Pwr	Operation	Damage
0 - 10 kW	d = 5 m	d = 2 m
10 - 30 kW	d = 9 m	d = 4 m
30 - 50 kW	d = 12 m	d = 5 m

But *most important keep the antenna outside of the radar beam* as shown here:



Even if the Fleet 55/77 installation has been made accordingly to all our recommendations, please be aware that shore-based transmitters also can disturb the system. Typically, this will occur first on the 64 Kb services, such as the ISDN Data and 3.1 KHz Audio and as closer the vessel gets to the source of the broadcast also the Mini-M voice service will be affected. In these cases the typically, error message in the Handset, while performing a call, will be the Cause Code: "**12C4$_h$**".

See more at: Can not make HSD calls (Speech, 3.1 KHz Audio or ISDN), but Mini-M voice/fax and MPDS is OK.

Back to FAQ

Can not connect to MPDS network

Often connection to MPDS network fails, error messages can be seen either on the PC screen or the Handset display. A typical failure on the Handset is "**00F0$_h$**" or "**00F1$_h$**", which is a message from the MPDS network that the terminal is not registered to the network.

A verification whether it is a problem on the terminal or the MPDS network can be done by running a Terminal session (e.g. HyperTerminal) and do the following:

Type	AT [Enter]
Response	*OK*
Type	AT+WS45=4 [Enter]
Response	*OK*
Type	AT+WREG=1 [Enter]
Response	*REGISTERED*
Type	ATD [Enter]
Response	*CONNECT 64000*
	(4 – 7 lines with characters of all kind) E.g.:
	~ }#À!}!}#} }8}"}&} }} } }#}$À#}%}&Èõ•ñ}'}"}{}" À~~ }#À!}!}$} }8}"}&} }*} } }#}*
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	}} } }#}$À#}%}&Èõ•ñ}'}"}{}"¿}+~*
	NO CARRIER
Type	AT+WREG=0 [Enter]
Response	*DEREGISTERED*

If the above procedure is fulfilled, the terminal is most likely not the cause of problem, but have to be investigated further at the LES/SBS.

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Solved problems or partly solved problems

1. "**MES time out**" and "**12C4$_h$**":
   Not all of this error messages has been solved.

   Some problems when having these error messages could be that the MO is out or adjustment. The MO adjustment is performed when the BDU is in the test jig by Thrane & Thrane by production. But it has been seen that the MO frequency has drifting or even not stored.

   The problem has been solved by the SW ver. 1.06 or later where an adjustment/calibration through the Handset can be performed.

2. "**MES time out**" and "**12C4$_h$**":
   Not all of this error messages has been solved.

   Some problems when having these error messages could be the IQ calibration is not correctly stored. The IQ calibration is performed when the BDU is in the test jig by Thrane & Thrane by production. But it has been seen that the IQ calibration has drifted or even tot stored.

   The problem has been solved by the SW ver. 1.05 or later where an adjustment/calibration through the Handset can be performed.

3. "**No Carrier**" on the PC screen:

   An error message often seen on the PC attached to the Fleet77/55, when trying to connect to the Internet server at the LES on ISDN. The problem has been located to a SW bug, where the terminal went into a failure state when the “High Speed”-codex was to be loaded.

   The problem has been solved by the SW ver. 1.08 or later.

4. "**Antenna (FEU) Link Down**":

   Not all of this error messages has been solved.

   It have been seen that when the input power to the Fleet77/55 system has not been adequate, the HPA has been wrongly supplied. This has caused a situation where the HPA starts deleting some lines of its internal software. It is not always the same lines that is being deleted, but in a block randomly chosen. If the deletion is taking place in the Boot-loader, the HPA is dead.

A part of this problem has been solved by the SW ver. 1.08 or later, where a checksum request from the BDU to the HPA will check whether the SW in the HPA is of latest version or have corrupted.

An external Power Supply for the Fleet77/55 (TT-3680F) is now available. This PS will ensure the correct power to the Fleet77/55.

5. "**Invalid Position**":

   A problem where the GPS can not get a fix will cause the system to report the failure. By resetting the system, the failure persisted. It has also been seen, that switching Off the Fleet77/55 and keep the system Off for 20-30 minutes, was correcting the problem. The problem was that some capacitors were keeping up the power for the memory chip of the GPS module, keeping some wrong information. By a normal power Off/On for reset these capacitors were not discharged, but if the power was Off for longer period the capacitors were discharged, causing the GPS start tracking the satellites after the power On.

   The problem has been solved by the SW ver. 1.08 or later in combination with the ACU SW ver. 2.15 (Fleet77) or ACU ver. 1.05 (Fleet55), where a more firm internal reset of the ACU and the GPS module has been introduced.

6. "**RX2 comm error**" and "**RX2 rssi too low**".

   Not all of this error messages has been solved.

   Some problems when having these error messages could be HW or SW defects of the RX2. On the "old" type of RX2 it was not possible to upload SW. Only replacement of the RX2 was possible.

   Some problems have been solved by the new RX2 others can be fixed by the RX2 SW ver. 3.08 or later.

7. Antenna can not be reset:

   The reset to the ADU will be performed, by shortly cutting the 40 VDC power to the antenna, but it has been seen that this reset power down pulse is not given from the BDU.

   The problem has been solved by component change on the Main Board of the BDU since production date 01.06.04.

Back to General

Power has dropped below 20 V

Whenever seeing this failure in the Alarm Log, be suspicious regarding the external power supply to the system. Too often it has been seen that an insufficient supply of power has created problems and multiple failures around in the system.

Take this message serious, even though that it is not possible to measure, by a voltmeter, any thing wrong. Even the slightest and shortest drop in the power below the 20 VDC, will be caught by the system and an alarm will be given. So an oscilloscope have to be used, and not even that is always sure, as the problem could happen in situations when sailing and the antenna is requiring the most power (HSD transmission, roll and pitch and yaw movement) or when batteries on the vessel is at a level where they need to be charged.

If the alarm is seen, it is recommended to install an external Power Supply to make sure that the power is sufficient.

Back to Handset Messages

Power to the antenna is only On for short time then Off

When measuring the power to the antenna the power can only be measured On for approx. 2 seconds and then gone for approx. 10 seconds.

Please be informed that the 40 VDC to the ADU is made in the PSU of the BDU. This PSU is a "Switch Mode" power supply. That means that when there is no load on the output, it will be tripped off. Therefore when trying go measure the power to the antenna by disconnecting the antenna cable and then measure the 40 VDC, the above condition bill be observed.

To make the correct measurement could be to insert a T-connector at the antenna cable connector so there will be a load from the antenna, and a port to measure. Additional the 40 VDC can be measured at the cable between Slip Ring Assembly and ACU (Cable 660-A0092).

Please also take notice, that it has been seen several times, that the Female-connectors of the antenna cable has been damaged because the test pins for the voltmeter has been inserted to roughly forcing the connector to open too much. This can later give problems resulting in poor connections of the real antenna cable.

But the above problem can also be caused to other failures in the ADU, see more at Antenna power distribution.

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Antenna (ADU) error messages

Error reported on handset (Alarm Log)	Description	When detected?	Corrective action (in order of precedence)
Kernel error Float pnt	ACU DSP has encountered a floating point overflow	Any time	Reset system Perform **Sensor Unit Test** according to the Antenna Diagnostic Program Perform **RX2 Dither Test** according to the Antenna Diagnostic Program Should not occur under normal conditions. May happen if some sensor failure has not been detected. Record failure type and address, and **contact Thrane & Thrane**
Kernel error SCI tsk	ACU real time operating system Serial Communication Interface task overrun	Any time	Should never occur. **Contact Thrane & Thrane**
Memory Error Control SW CRC	CRC failure of program code stored in ACU flash memory	Startup/ Reset	Contents of ACU FLASH memory corrupted. Reload control S/W. Replace ACU if failure persists
Memory Error ACU Cnf Data	CRC failure of ACU configuration data stored in EEPROM	Startup/ Reset	Contents of ACU EEPROM corrupted. Reload configuration data. Replace ACU if failure persists
Memory Error FLASH mem	ACU FLASH memory hardware failure	Startup/ Reset	Replace ACU
Memory Error ACU SRAM	ACU SRAM hardware failure	Startup/ Reset	Replace ACU

Memory Error ACU EEPROM	ACU EEPROM hardware failure	Startup/ Reset	Replace ACU
Memory Error FPGA Init	FPGA on ACU failed to initialise	Startup/ Reset	Replace ACU No communication via debug test port will be possible
Memory Error FPGA Init	FPGA software CRC failure	Startup/ Reset	Contents of ACU FLASH memory corrupted. Reload FPGA software. Replace ACU if failure persists No communication via debug test port will be possible
Motor error Azm Drive	Azimuth gimbal drive train is broken	Startup/ Reset	Visually inspect drive train to determine failure
Motor error Elv Drive	Elevation gimbal drive train is broken	Startup/ Reset	Visually inspect drive train to determine failure
Motor error Azm winding	No current detected in windings of azimuth stepper motor	Startup/ Reset	Check wiring and connectors. Replace ACU. Replace azimuth motor
Motor error Elv winding	No current detected in windings of elevation stepper motor	Startup/ Reset	Check wiring. Replace ACU. Replace elevation motor
Motor error BSM winding	No current detected in windings of stepper motor of beam steering mechanism	Startup/ Reset	Check wiring. Replace ACU. Replace antenna/hybrid assembly
Motor error FPGA cmdto	FPGA timed out – no command received from DSP	Startup/ Reset	Should never occur. **Contact Thrane & Thrane**

Pos feeback BSM zero ref	Any of two zero reference detectors of beam steering mechanism not operational	Startup/ Reset	Check wiring. Replace antenna/hybrid assembly
Pos feedback Elv Positive Endstop	Elevation gimbal negative end stop detector not operational	Startup/ Reset/ Anytime	Check wiring. Replace micro switch. Replace ACU
Pos feedback Elv Negative Endstop	Elevation gimbal negative end stop detector not operational	Startup/ Reset/ Anytime	Check wiring. Replace micro switch. Replace ACU
Pos feedback Azm zero ref	Azimuth zero reference not operational	Startup/ Reset	Check wiring. Replace zero reference PCB. Replace ACU
SU Error Cal Data CRC	CRC failure of calibration data stored in sensor unit	Startup/ Reset	Reset system. Replace SU if failure persists
Su Error Initialize	SU unit failed to initialise successfully	Startup/ Reset	Reset system. Replace SU if failure persists
SU Error Comm	No serial communication between ACU and SU	Any time	Check wiring and slip rings. Perform **Slip Ring Continuity Test** according to the Antenna Diagnostic Program. Replace SU. Replace ACU.

SU Error Protocol	Non intermittent failure in protocol between ACU and SU	Any time	Check wiring and slip rings. Perform **Slip Ring Continuity Test** according to the Antenna Diagnostic Program. Replace SU. Replace ACU
SU Error Sys info CRC	CRC failure of SU system info	Startup/ Reset	Reset system. Replace SU if failure persists
Sensor Err Roll Incl	Roll inclinometer continuously out of expected operational range	Any time	Perform **Sensor unit test** according to the Antenna Diagnostic Program
Sensor Err Pitch Incl	Pitch inclinometer continuously out of expected operational range	Any time	Perform **Sensor Unit Test** according to the Antenna Diagnostic Program
Sensor Err Roll rate	Roll rate sensor continuously out of expected operational range	Any time	Perform **Sensor Unit Test** according to the Antenna Diagnostic Program
Sensor Err Pitch rate	Pitch rate sensor continuously out of expected operational range	Any time	Perform **Sensor Unit Test** according to the Antenna Diagnostic Program
Sensor Err Yaw rate	Yaw rate sensor continuously out of expected operational range	Any time	Perform **Sensor Unit Test** according to the Antenna Diagnostic Program

Ctrl Logic ACU Matrix	Algorithmic error – may be caused by faulty sensor data – e.g. no correlation between inclinometer and rate sensor data	Any time	Should not occur under normal conditions. May happen if some sensor failure has not been detected. Reset system Perform **Sensor Unit Test** according to the Antenna Diagnostic Program Perform **RX2 Dither Test** according to the Antenna Diagnostic Program
Ctrl Logic RX2 Comm	No serial communication between ACU and second receiver	Any time	Check wiring. Replace RX2. Replace ACU
Ctrl Logic RX2 Autotune	Second receiver not receiving any signal while the BDU is reporting a valid signal and the second receiver is commanded by the ACU to optimise its signal strength	In Optimising and Tracking states	Reset system. Replace RX2 if failure persists
Ctrl Logic ACU resett.	Raised on reception of reset command, cleared on start of reset	On reception of reset command	Normal "failure". Ignore
Ctrl Logic RX2 tunetmo	RX2 frequency tuning failed during long term drift estimation	In Tracking state	Reset system. Replace RX2 if failure persists
Ctrl Logic RX2 dither	RX2 tracking data out of range	Any time	Reset system. Replace RX2 if failure persists

Ctrl Logic RX2 PLL	RX2 PLL fails to lock – possibly too much external interference	Any time	Reset system. Check for external interference. Replace RX2 if failure persists
	Details of floating point error		Record this information in the event of a floating point failure, and **contact Thrane & Thrane**

Back to Handset Messages

Antenna (ADU) warning messages

Warning reported on handset (Warning Log)	Description	When detected?	Corrective action
Vib. Threshold Exceeded	Vibration levels of antenna installation continuously exceeds allowed limits	Any time	Download vibration statistics Check installation **Contact Thrane & Thrane**
"RX2 RSSI too low" shown briefly at startup, and then "Waiting for NCS" forever	RX2 received signal strength too low – DLNA possibly not powered. Warning can clear automatically (e.g. when LNA is powered).	Any time	Verify that DLNA is powered Replace DLNA Replace RX2
Incomplete GPS Init	GPS engine did not receive both hard and soft reset from ACU.	Any time	Replace ACU
RX2 RSSI too high	RX2 received signal strength too high – possibly too much external interference. Warning can clear automatically (e.g. when external interference is removed).	Any time	Move antenna to another location with less external interference. Replace RX2
Instl. Angle CRC Failure	CRC of antenna installation angle stored in EEPROM failed	Startup/ Reset	Re-configure installation angle, otherwise ACU will assume a zero degree installation angle

Maint. Data CRC Failure	CRC of maintenance data logged in EEPROM failed	Startup/ Reset	Will occur if maintenance data has never been logged (first 15 minutes after ACU is powered for the first time). Replace ACU if failure persist, otherwise hour meter may not be valid
Vib. Data CRC Failure	CRC of vibration data logged in EEPROM failed	Startup/ Reset	Will occur if maintenance data has never been logged (first 15 minutes after ACU is powered for the first time). Replace ACU if failure persist, otherwise hour meter may not be valid
Short duration warning "Azimuth Encd failure" when failure is detected. If detected at startup – no warning is shown	Incremental encoder on azimuth gimbal motor not counting correctly . Encoder is ignored and gimbal is controlled open loop based on stepper motor steps	Any time	Check wiring Replace azimuth motor assembly Replace ACU
Short duration warning "Elevation Encd failure" when failure is detected. If detected at startup – no warning is shown	Incremental encoder on elevation gimbal motor not counting correctly . Encoder is ignored and gimbal is controlled open loop based on stepper motor steps	Any time	Check wiring Replace elevation motor assembly Replace ACU
Elevat. Pos Endstop Fail	Elevation gimbal positive end stop detector not operational	Startup/ Reset	Check wiring. Replace micro switch. Replace ACU
Elevat. Neg Endstop Fail	Elevation gimbal positive end stop detector not operational	Startup/ Reset	Check wiring. Replace micro switch. Replace ACU

BSM drive failure	BSM is faulty – antenna is most likely not squinting correctly	Any time	Squint mechanism is only used at high satellite elevations – antenna can still function with faulty BSM at low satellite elevations Check wiring Perform **Squint Test** according to the Antenna Diagnostic Program Replace antenna/hybrid assembly Replace ACU
Unknown warning	ACU software loaded is incompatible	Startup	Reprogram ACU or replace ACU
SU X acceler failure	X axis accelerometer in SU has failed – used for vibration statistics only . Accelerometer is not required for normal antenna operation	Startup/ reset	Replace sensor unit
SU Y acceler failure	X axis accelerometer in SU has failed – used for vibration statistics only . Accelerometer is not required for normal antenna operation	Startup/ reset	Replace sensor unit
Track Data CRC failure	CRC failure of last successful tracking data stored in EEPROM – ACU marks data as invalid and proceed as normal. Indicates EEPROM failure if failure persists	Startup/ reset	Wait until antenna has successfully acquired a satellite and the ACU has entered the TRACKING state, then reset the system. Replace ACU if warning persists

RX2 Caldata CRC failure	RX2 calibration data read from RX2 EEPROM is out of range. ACU ignores data and use default values	Startup/ reset	Replace RX2
RX2 chn offs too big	RX2 channel offset as determined during RX2 auto-tuning is too big	Any time in Optimising and Tracking state	Replace RX2 if problem is persistent
Azi 0 vane calib fail	Width of azimuth zero vane not as expected – result is ignored and default value is used	Startup/ Reset	If azimuth encoder failure is also present, first fix encoder problem. Visually inspect azimuth drive train during initialisation Replace zero reference PCB
BSM 0 vane calib fail	Width of BSM zero vane not as expected – result is ignored and default value is used	Startup/ Reset	Visually inspect BSM mechanism and verify that it operates smoothly Check wiring Perform **Squint Test** according to the Antenna Diagnostic Program Replace antenna/hybrid assembly

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FEU Version Mismatch

The error message "**FEU Version Mismatch**" is an indication that the Fleet has detected a checksum failure in the HPA software. This can happen when new BDU SW is uploaded, and the HPA SW is still of the previous version. With BDU SW 1.08 and later, an automatic upload to the HPA is done when BDU SW has checked the version.

Likewise, whenever the BDU is reset/rebooted (power Off/On) a checksum verification of the HPA SW is done. If failed, the BDU will automatically upload the HPA SW.

In some few cases, this automatically upload can fail, resulting in the error message "**FEU Version Mismatch**". In that case, a manual HPA SW upload has to be performed.

Manually HPA upload is done as follows:

1. Press Menu.
2. Scroll down to "**Super User**", press OK
3. Enter the SuperUsr PIN code, press OK
4. Scroll down to "**Ant. Setup**", press OK
5. Scroll down to "**Upload FEU**", press OK
6. At the request "**Upload OK ?**", press OK
7. "**FEU Upload Done**" is indicating correct upload
8. Press Exit three times

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Technical Notes

Following Technical Notes for the Fleet77and/or Fleet55 has been sent out on our Extranet since the April, 2002:

	This service note is about a software bug in the F77 software ver. 1.00.
18-04-02:	This service note describes the modification of the Capsat® F77, 2nd Receiver.
08-07-02:	This service note concerns the replacement of the configuration module for Capsat® F77.
23-08-02:	New BDU Software ver 1.02 and new FleetCP Software ver. 2.02.
08-05-03:	New BDU Software version 1.03.
10-06-03:	New BDU Software version 1.04.
09-07-03:	New BDU Software version 1.05.
29-07-03:	F77 and F55 terminals (TT-3038C) has been shipped from Thrane & Thrane without IQ calibration made or stored.
05-08-03:	New BDU Software version 1.06.
01-10-03:	Supply power description.
11-02-04:	F77 Service Hatch.
13-02-04:	F55 Extended Spot Beam Coverage.
03-03-04:	F77, Re-route cable loom.
03-03-04:	New FleetCP for Fleet33, F55 & F77.
10-04-04:	F77 - Release ver. 308 RX2 and 215 ACU.
10-04-04:	F55 - Release ver. 308 RX2 and 105 ACU.
10-04-04:	Cable Loom Failure.
13-04-04:	New BDU Software version 1.08.
29-04-04:	New FleetCP for F33, F55 & F77.
21-06-04:	F77 & F55: Cradle Cable Failure.
07-09-04:	F77 - Release ver. 2.16 ACU.
14-09-04:	F55 - Release ver. 1.06 ACU.
14-09-04:	

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Revision history of this Trouble Shooting Guide

1.00	Original release

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