

Pam 2520 – Operating Instructions

For firmware version 4.0 and above



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1 Introduction

The 'PAM' AAE Model 2520 tester charger has been designed to carry out a number of sub sea acoustic tasks. The basic version allows the testing and charging of a wide variety of beacons.

The applications which have been included in the basic PAM software are as follows:

- Charging AAE beacons and some other manufactures beacons.
- Basic testing of beacons.
- Four channel ranging functions.
- AAE 669-138 Pinger receiver.
- AAE Release Functions.

The PAM can be used for other applications as optional extras. These include the following:

- Command of Simrad MPT/SPT Transponders.
- AAE Acoustic Telemetry functions.
- Altimeter functions.
- Other customised functions.

2 Unpacking and Setting Up

2.1 System Contents

The PAM unit consists of the following items:

- PAM Model 2520
- Mains Lead
- Responder / Charger lead
- This Manual

2.2 Switching the PAM On

The PAM will arrive with the internal battery uncharged. To charge the battery, connect the mains lead to the PAM and switch on the mains at the wall socket. Switch on the PAM at the back of the unit, this switch is located just above the mains inlet connector. The mains LED on the front panel should be on. The internal battery will be charging when either the PAM is in standby mode or the PAM is on. It should take 6 Hours to fully charge the battery.



Rear View of PAM 2520

To switch the PAM on from standby press the ON STANDBY button. After a short time the display will show the main menu options.

PAM2520	Beacon = Trickle	11:09	
F1 = Transponder Testing Functions			
F2 = Ranging & System Setup Functions			
F3 = Telemetry & Release Functions			
F4 = Transponder & Release Functions			
F1	F2	F3	F4

PAM 2520 Main Menu

2.3 Using the Internal Battery

The internal battery is designed to power the unit where mains is not available. It cannot be used for charging beacons. The PAM will automatically switch to the internal battery when the mains is switched off. The mains LED will go off and the LCD back light will also go off.

2.4 Setting the Clock

The PAM 2520 has a real time clock built in to it. The clock is powered by a small battery which will last for up to 10 years. To set up the clock, first make sure the PAM is displaying the main menu. If not press the RETURN key until the main menu is displayed.

Press F2 to go into the Ranging and System Menu.

Press F4 to go into the System Set Up Functions.

Press F4 to go into Clock.

To adjust the time press the F1 key.

PAM2520	Beacon = Trickle	11:09
11:09		
Select the Function & Arrow Keys		
Hour	Minute	

Menu for setting up the time

To adjust the hour hold down the F1 key and press the arrow keys. The hour in the centre of the LCD display will slowly increment or decrement depending on which arrow key is being pressed.

To adjust the minute hold down the F2 key and press the arrow keys. The minute in the centre of the LCD display will slowly increment or decrement depending on which arrow key is being pressed.

To exit the time menu, press the RETURN key.

Note: the time at the top right of the display will not change until the minute after the clock menu has been exited.

To set the date Press the F2 key when in the clock menu. The menu will display the date menu.

PAM2520	Beacon = Trickle	11:09
24-06-2002		
Select the Function & Arrow Keys		
Year	Month	Day

Menu for setting up the date

To adjust the year hold down the F1 key and press the arrow keys. The year in the centre of the LCD display will slowly increment or decrement depending on which arrow key is being pressed.

To adjust the month hold down the F2 key and press the arrow keys. The month in the centre of the LCD display will slowly increment or decrement depending on which arrow key is being pressed.

To adjust the day hold down the F3 key and press the arrow keys. The day in the centre of the LCD display will slowly increment or decrement depending on which arrow key is being pressed.

Press the RETURN key four times to go back to the main menu.

3 Charging the Beacons

The PAM 2520 can be used to charge a beacon instead of using a separate charger. To charge the beacon, first connect the charger lead to the front panel socket marked 'Beacon'. Connect the other end of the lead to the beacon to be charged. If the lead is not the correct type for the beacon then contact AAE for information on the correct connector.

Switch the beacon off and select the transponder charging functions (F4) on the PAM main menu.

PAM2520 Beacon = Trickle 11:09		
F1 = AAE 900 Series Beacons F2 = AAE 800 Series Beacons F3 = Other Beacons		
F1	F2	F3

Beacon Charging Options

Select which family of beacon you wish to charge e.g. for an AAE919 beacon press F1. The PAM will then display a more detailed screen to allow you to select the exact beacon. A flashing cursor shows the beacon, which is currently selected. Use F3 and F4 to move the cursor up and down and press F1 once the correct beacon has been selected. The table below shows the beacons which can be charged, contact AAE for information on other beacons.

WARNING - DO NOT ATTEMPT TO CHARGE ANY BEACON WHICH IS NOT ON THE LIST WITHOUT CONSULTING AAE FIRST.

Beacon Select	Beacon Family	Beacons which can be charged
AAE 91x	900 Series	919,916,915,915H,419
AAE 93x	900 Series	939,935,933(not TFT),930
AAE 94x	900 Series	949,945,940
AAE 95x	900 Series	959,956,955,955H
AAE 96x	900 Series	965,962
AAE 97x	900 Series	972,970
AAE 81x	800 Series	819,816
AAE 83x	800 Series	839,835,830,829,826
AAE 84x	800 Series	Long 83x tubes
AAE 85x	800 Series	8590,8560,8545
SimMHT	Other Beacons	Simrad MHT316, MHT319
SimRPT	Other Beacons	Simrad RPT316,RTP319,RPT324
Son 7656	Other Beacons	Sonardyne 7656, Directional & Omni-directional
ORE 4330A	Other Beacons	4320A, 4330A
ORE 4350A	Other Beacons	ORE's high power Beacons

Once the beacon has been selected the PAM will display the main charging menu.

PAM2520 Beacon = Trickle	11:09
Beacon Selected = AAE 91x Discharging Charging Trickle Charging	
Start	Stop

Main Charging Menu

Press F1 to begin the charging process. The cursor will move to the discharging display and the top line will display “Beacon = Dumping”.

Once the beacon has finished dumping it will automatically begin to charge the beacon. The cursor will move to the charging line and display the time remaining before the beacon has been charged. This information is repeated on the top line of the display. Once the beacon has been fully charged the cursor will move to the trickle charge line and the top line will indicate that the beacon is being trickle charged.

If an error had occurred during the charge process the display would show Error Open Circuit and this will be shown on the top line.

A beacon can be charged whilst performing other tasks using the PAM. The top line will show the status of the charging process. The only task that cannot be carried out during charging is any application that requires the use of the ‘beacon’ connector e.g. responder testing.

Warning

If a beacon is fitted with primary cells such as alkaline or lithium then **DO NOT ATTEMPT** to charge these cells, as this could cause an explosion or serious injury.

If any beacon becomes warm to the touch, the charge cycle should be terminated. Additionally, it is suggested that the securing screws of AAE beacon bottom end-caps be removed before charging. This will stop excessive internal pressure from building up in case of operator error or any other abnormal charging conditions.

4 Beacon Testing Functions

The PAM is capable of testing many different types of beacons. The PAM is capable of measuring the turnaround time, pulse widths and transmit frequency from the beacon.

The testing functions have been designed to be used in air. The test transducer should be placed approximately half a meter from the beacon's transducer. The testing functions will not work in water and should not be used for ranging functions.

The test transducer should be connected to the front panel transducer socket. To test the responder function the charge lead should be connected to the beacon and the other end connected to the beacon connector.

The turn around time (TAT) is the time it takes for the beacon to respond to an interrogate signal. This time depends the type of beacon and how far the beacon is away from the test transducer.

The pulse width is the length of the transmitter pulse. This value can vary due to the beacon type. The transducers are designed to work in water and this and the transducer resonance will affect the pulse width measured. If the PAM indicates a pulse width significantly longer or shorter than expected then the beacon may be faulty.

The final parameter which is tested is the beacon reply frequency. The PAM will work out the frequency of the receive signal and display the results. If the frequency is out of the expected band then it will display an error message as well as the received frequency.

Press F1 to go into the main testing functions. Press F4 to go into the second main menu and F1 to go back to the first main menu.

PAM2520 Beacon = Trickle 11:09
PAM Testing Function
Select button under text. RETURN Exits
Hipap SON USBL
HPR4 HPR3 TrackPoint next

Main Test Menu

PAM2520 Beacon = Trickle 11:09
PAM Testing Function
Select button under text. RETURN Exits
LF HPR
Previous PINGER HPR4 1507

Second Test Menu

4.1 HPR4 / HiPAP Testing

This is used for testing HiPAP / HPR4 compatible beacons.

PAM2520 Beacon = Trickle	11:09
Hipap 56 Channel Testing Function	
Channel 24 TAT = xx.xxms Freq.=xx.xxKHz	
PW = xx.xxms	
Trans.	CH Up CH Down Search

HiPAP / HPR4 Test Display

The frequencies used for HPR4 are detailed below.

Switch 1	Switch 2	Interrogate1	Interrogate 2	Reply
1	2	21KHz	21.5KHz	29.25KHz
1	3	21KHz	22KHz	29.75KHz
1	4	21KHz	22.5KHz	30.25KHz
1	5	21KHz	23KHz	30.75KHz
1	6	21KHz	23.5KHz	27.25KHz
1	7	21KHz	24KHz	27.75KHz
1	8	21KHz	24.5KHz	28.25KHz
2	1	21.5KHz	21KHz	28.5KHz
2	3	21.5KHz	22KHz	29.5KHz
2	4	21.5KHz	22.5KHz	30KHz
2	5	21.5KHz	23KHz	30.54KHz
2	6	21.5KHz	23.5KHz	27KHz
2	7	21.5KHz	24KHz	27.5KHz
2	8	21.5KHz	24.5KHz	28KHz
3	1	22KHz	21KHz	28.75KHz
3	2	22KHz	21.5KHz	29.25KHz
3	4	22KHz	22.5KHz	30.25KHz
3	5	22KHz	23KHz	30.75KHz
3	6	22KHz	23.5KHz	27.25KHz
3	7	22KHz	24KHz	27.75KHz
3	8	22KHz	24.5KHz	28.25KHz
4	1	22.5KHz	21KHz	30KHz
4	2	22.5KHz	21.5KHz	29KHz
4	3	22.5KHz	22KHz	29.5KHz
4	5	22.5KHz	23KHz	30.5KHz
4	6	22.5KHz	23.5KHz	27KHz
4	7	22.5KHz	24KHz	27.5KHz
4	8	22.5KHz	24.5KHz	28KHz
5	1	23KHz	21KHz	28.75KHz
5	2	23KHz	21.5KHz	29.25KHz
5	3	23KHz	22KHz	29.75KHz
5	4	23KHz	22.5KHz	32.25KHz
5	6	23KHz	23.5KHz	27.25KHz
5	7	23KHz	24KHz	27.75KHz
5	8	23KHz	24.5KHz	28.25KHz
6	1	23.5KHz	21KHz	28.25KHz
6	2	23.5KHz	21.5KHz	29KHz
6	3	23.5KHz	22KHz	39.5KHz
6	4	23.5KHz	22.5KHz	30KHz
6	5	23.5KHz	23KHz	30.5KHz
6	7	23.5KHz	24KHz	27.5KHz
6	8	23.5KHz	23.5KHz	24.5KHz
7	1	24KHz	21KHz	28.75KHz
7	2	24KHz	21.5KHz	29.25KHz
7	3	24KHz	22KHz	29.75KHz
7	4	24KHz	22.5KHz	30.25KHz
7	5	24KHz	23KHz	30.75KHz
7	6	24KHz	23.5KHz	27.25KHz
7	8	24KHz	24.5KHz	28.25KHz
8	1	24.5KHz	21KHz	28.5KHz
8	2	24.5KHz	21.5KHz	29KHz
8	3	24.5KHz	22KHz	29.5KHz
8	4	24.5KHz	22.5KHz	30KHz
8	5	24.5KHz	23KHz	30.5KHz
8	6	24.5KHz	23.5KHz	27KHz
8	7	24.5KHz	24KHz	27.5KHz

To test the beacon in transponder mode connect the test transducer to the front panel. Position the test transducer approximately half a meter away from the beacon's transducer. Use the F2 and F3 keys on the PAM to select the channel, which the beacon is set to. Make sure the beacon is switched on and the PAM should display the turn around time, pulse widths and frequency. The turn around time for HPR4 should be approximately 60mS in transponder mode. The pulse width should be approximately 10mS and the frequency is dependant on the channel the transponder is set to.

To test the beacon in responder mode, connect the charge/responder lead to the front panel and the other end to the beacon. Ensure the test transducer is approximately half a meter away from the beacon's transducer. Press F1 to set the PAM to responder mode. The turn around time should be approximately 30mS. The pulse width will be approximately 10mS and the frequency dependant on the transponder channel.

Note: In responder mode the beacon will always reply to an interrogate pulse, no matter what channel the beacon is set to. The PAM will pick this up and may indicate an incorrect frequency if is set to the wrong channel.

4.2 Sonardyne USBL / HPR3 Testing

This testing function is similar to the HPR4 testing the only difference is the frequencies used and the turn around time in transponder mode. This will be 30mS instead of 60mS. The frequencies and channel numbers are detailed in the table below. To go into the HPR3 test mode from the main test menu press F2.

Channel	Symbol	Interrogate	Reply
11 □	○	21.552KHz	27.173KHz
22		22.727KHz	28.409KHz
33	Δ	23.923KHz	29.762KHz
44	X	25.126KHz	31.250KHz
55	Y	26.455KHz	32.467KHz
1	1	20.492KHz	29.762KHz
2	2	21.552KHz	30.488KHz
3	3	22.124KHz	31.250KHz
4	4	22.727KHz	31.847KHz
5	5	23.364KHz	32.468KHz
6	6	24.038KHz	27.173KHz
7	7	24.510KHz	27.777KHz
8	8	25KHz	28.409KHz
9	9	26.042KHz	29.070KHz

4.3 Trackpoint Testing Functions

This testing function is designed to test Trackpoint beacons. From the main testing menu press F3 to go into the testing mode.

PAM2520	Beacon = Trickle	11:09	
TRACKPOINT TESTING FUNCTION			
Tx Freq.17000 TAT=xx.xxms F=xx.xxKHz			
Rx Freq.27000 PW = x.xxms			
Trans.	Tx Freq	Rx Freq	Search

Trackpoint Testing Menu

Position the test transducer the same as the other test modes. To change the interrogate frequency, hold down F2 and press either the up arrow to increase the frequency or the down arrow to decrease the frequency. To change the reply frequency, hold down F3 and either press the up arrow to increase the frequency or the down arrow to decrease the frequency.

Available frequencies are in the range 10kHz to 30 kHz in 1 kHz steps.

4.4 Pinger Testing Function

The pinger test function is on the second test menu. To reach it from the first menu press F4. To select the pinger test function press F2.

PAM2520	Beacon = Trickle	11:09	
Rx Freq. = 26000Hz		Rx Gain = 0	
Rx Inhibit = 400mS		Time Out = 1S	
Ping Rate = xxxxms			
Rx Freq	Inhibit	Rx Gain	TimeOut

Pinger Test Menu

Position the test transducer or suitable dunking transducer the same as the other test modes. To adjust the receive frequency, hold down F1 and press either the up arrow to increase the frequency or hold the down arrow to decrease the frequency. To change the receiver gain hold F3 and either press the up arrow to increase the gain or the down arrow to decrease the gain.

Available frequencies are in the range 10 – 30 kHz plus 37.5 kHz.

The Rx Gain adjustment allows the amplification to be adjusted to suit the acoustic conditions experienced. The inhibit time can be adjusted up to 400ms; this assists in reducing the detection of multipath (reflections) which might otherwise give an inaccurate ping rate.

4.5 Low Frequency HPR4 Testing Function

This testing function is similar to the HPR4 testing function, the only difference being the frequencies used. The frequencies and channel numbers are detailed in the table below. To go into the LF HPR4 test mode from the second test menu, press F3.

Switch 1	Switch 2	Interrogate 1	Interrogate 2	Reply
1	2	10KHz	10.5KHz	13.75KHz
1	3	10KHz	11KHz	14.25KHz
1	4	10KHz	11.5KHz	14.75KHz
1	5	10KHz	12KHz	15.25KHz
1	6	10KHz	12.5KHz	15.75KHz
2	1	10.5KHz	10KHz	13KHz
2	3	10.5KHz	11KHz	14KHz
2	4	10.5KHz	11.5KHz	14.5KHz
2	5	10.5KHz	12KHz	15KHz
2	6	10.5KHz	12.5KHz	15.5KHz
3	1	11KHz	10KHz	13.25KHz
3	2	11KHz	10.5KHz	13.75KHz
3	4	11KHz	11.5KHz	14.75KHz
3	5	11KHz	12KHz	15.25KHz
3	6	11KHz	12.5KHz	15.75KHz
4	1	11.5KHz	10KHz	13KHz
4	2	11.5KHz	10.5KHz	13.5KHz
4	3	11.5KHz	11KHz	14KHz
4	5	11.5KHz	12KHz	15KHz
4	6	11.5KHz	12.5KHz	15.5KHz
5	1	12KHz	10KHz	13.25KHz
5	2	12KHz	10.5KHz	13.75KHz
5	3	12KHz	11KHz	14.25KHz
5	4	12KHz	11.5KHz	14.75KHz
5	6	12KHz	12.5KHz	15.75KHz
6	1	12.5KHz	10KHz	13KHz
6	2	12.5KHz	10.5KHz	13.5KHz
6	3	12.5KHz	11KHz	14KHz
6	4	12.5KHz	11.5KHz	14.5KHz
6	5	12.5KHz	12KHz	15KHz

4.6 HPR1507 Low Frequency Transponders

This testing function is similar to the HPR4 testing the only difference is the frequencies used and the turn around time in transponder mode. This will be 30mS instead of 60mS. The frequencies and channel numbers are detailed in the table below. To go into the HPR1507 test mode from the second test menu, press F4.

Switch 1	Switch 2	Interrogate	Reply
0	1	9.901KHz	13.158KHz
0	2	10.309KHz	13.587KHz
0	3	10.707KHz	14.045KHz
0	4	11.111KHz	14.451KHz
0	5	11.547KHz	14.881KHz

4.7 Search Functions

On each of the beacon's test menu there is an option to go into the beacon search functions. Pressing F4 in each of the individual test function menus enters the search menu.

The search function will scan through the entire range of beacon frequencies to try and identify which channel the beacon is on.

PAM2520 Beacon = Trickle 11:09			
F1 = Search for HPR4 MF LF Beacons F2 = Search for HPR3 / HPR1507 Beacons F3 = Search for Trackpoint Beacons			
F1	F2	F3	F4

Beacon Search Functions

To search for an HPR4 beacon press F1 followed by F2 for an MF beacon. The PAM will then start to find the channel number the beacon is set to. If it has found the correct beacon then it will display the channel number, otherwise it will display 'Beacon Not Found'. To stop the search, press the F4 button.

5 Ranging

5.1 Setting the Speed of Sound in Water

Before any ranging can be done, the speed of sound in water must be set. To do this from the main menu, Press F2. Then Press F4 followed by F1.

PAM2520	Beacon = Trickle	11:09	
Speed of Sound in Water			
<u>1</u> 5 0 0			
Left	Right	Up	Down

Speed of Sound in Water Menu

To alter the speed of sound press either the F1 key to move the left by 1 digit or press F2 to move the cursor right one digit. Press F3 to increment the digit by one or press F4 to decrement the digit by one. Press the return key to exit this menu.

5.2 Setting the Rx Gain, Tx Gain and Averaging

To get the best results from the ranging functions, it may be necessary to change some of the parameters. This can be done by going into the 'Rx Gain, Tx Power, Averaging' menu option. To reach this menu from the main menu Press F2 followed by F3.

PAM2520	Beacon = Trickle	11:09
F1 = Tx Power - Low F2 = Rx Gain - High F3 = Averaging - Low		
F1	F2	F3

Rx Gain, Tx Power, Averaging Menu

To change the Tx power press F1. The Tx power will switch between low, medium and high. Steps are at approximately 6dB increments.

To change the Rx gain press F2. The Rx Gain will toggle between low, medium and high.

To change the averaging press F3. The averaging will switch between off, low, medium and high.

Press the RETURN key to exit this menu.

5.3 Starting the Ranging

To enter the ranging function from the main menu press F2 followed by F1.

PAM2520	Beacon =	Trickle			11:09
1	off	HPR4	12	2S	xxxx.xx M
2	off	HPR3	1	2s	xxxx.xx M
3	off	HPR4	13	2s	xxxx.xx M
4	off	HPR4	24	2s	xxxx.xx M
Left		Right		Up	Down

Ranging Menu

To change the beacon type, move the cursor to the column starting with HPR and use the arrow keys to toggle between HPR3 and HPR4.

To change the channel number, move the cursor to the next column on the right. Use the up arrow key to increase the channel number or the down arrow key to decrement the channel number.

To change the time out value (repetition rate), move the cursor to the fourth column (2s) and press the up arrow to increase the timeout and the down arrow to decrease the timeout.

Connect the dunker transducer to the front of the PAM and position the dunker over the side of the vessel. To obtain the best results ensure the dunker transducer is hanging vertically and is free of any obstructions, such as the vessel's hull.

To switch on the ranging, move the cursor to the first column (off) and press the up arrow to switch the ranging for that channel to On. The PAM will start to range to the selected beacon.

If the averaging is set high then it will take a few interrogations before the range settles down. If you are tracking a fast moving object then the averaging should be set to low.

6 4 Rate 669-138 Pinger

This function has been designed to be used with the AAE 669-138 pingers and the older Simrad 138 pingers. To enter the four rate pinger menu from the main menu press F2 twice.

PAM2520 Beacon = Trickle	11:09
Receiver Gain = Minimum	
Ping Rate = xxxxmS x Pings Per x Second	
Gain Up	Gain Down

Four Rate Pinger Menu

Pressing F1 will increase the gain of the PAM, while pressing F2 will decrease the gain. The gain should be set so that the PAM can reliably receive the signals without corruption. In a highly reverberant location such as a dock the gain should be set to the minimum, while if the pingers are located a long distance from the dunker the gain should be set high.

The Dunker should be positioned below the vessel, free from any obstructions such as the vessel's hull.

Once the PAM is correctly receiving the pings from the pinger, it will display the time between the pings and which electrical contact is closed on the pinger.

7 AAE Release Functions

This function is to be used with the AAE range of releases. For detailed operation of a particular release refer to its manual.

To locate the release functions from the main menu press F3 followed by F2. The PAM will then display the main release menu.

PAM2520 Beacon = Trickle		11:09	
Channel HPR4 12	Arm U	Tilt U	
ID 0	Release U	Fault U	
	Sleep U		
Setup	Status	Arm	Release

Main Release Menu

The PAM displays the status of the release parameters. When the menu is first displayed it will show a 'U' next to each value. This means the PAM does not know the status of the release and the 'U' stands for 'Unknown'. The parameters stand for the following:

- Arm – has the release been armed, 0 = disarmed 1 = armed.
- Tilt – if the release lying in a position greater than 15 degrees from vertical. 0 = less than 15 degrees 1 = greater than 15 degrees.
- Release – has the beacon been released. 0 = primed 1 = released.
- Fault – is there a fault on the release, 0 = no fault 1 = fault.
- Sleep – is the release in sleep mode, 0 = wake 1 = sleep.

When using the release command, the Tx power and Rx gain will need to be set up. Refer to section 5.2 for details on setting these parameters.

7.1 Setting the release ID and Channel number

In order to be able to communicate with the release, the PAM needs to know which mode the release is in and the ID the release is set to. For information in setting the release mode and ID refer to the release manual.

To go into the set-up menu press F1.

PAM2520	Beacon = Trickle	11:09	
Mode	= HPR4		
Channel	= 12		
ID	= 0		
Mode	Channel	ID	Next

Release Set Up menu

To set the mode press F1 key. This will switch between HPR4, HPR3, HPR4 LF and HPR1507.

To set the channel number hold down the F2 key and press the up arrow to increment the channel number or the down arrow to decrement the channel.

To set the ID number hold down the F3 key and press the up arrow key to increment the ID number or press the down arrow to decrement the ID number.

7.2 Obtaining the Status of the Release

To obtain the status of the release go into the main release menu and then press F2. The PAM will show a list of status options.

To read the general status flag press F1. If the release has correctly received the status message it will reply with the status. The PAM will automatically go back into the main release menu, but instead of showing 'U' next to the parameters it will show the correct values. If the release has not received the message the PAM will display an error message.

To read the tilt status of the release press F2. The release will then reply with the position of the two tilt sensors. These values will then be displayed on the PAM.

To read the detailed fault status of the release press F3. The release will then reply with the fault status of the release. This will be displayed on the PAM display.

7.3 Arming and Disarming the Release

For the release to operate it must first be armed. To do this, press F3 when in the main release menu. The PAM will then display two options, the first

option is to clear the arm status of the release and the second option is to arm the release.

Press F1 and the PAM will command the release to disarm. If the release has received the message correctly it will automatically go into the main release menu with the arm flag set to zero, otherwise the PAM will display an error message.

Press F2 and the PAM will command the release to arm. If the release has received the message correctly it will automatically go into the main release menu with the arm flag set to one, otherwise the PAM will display an error message.

7.4 Operating the Release

To operate the release mechanism the release needs to be armed first. See Section 7.3 for details on arming the release. To operate the release the PAM must first be in the main release menu. Press F4 and the PAM will send the release command. If the release has correctly received the message it will reply with a status message. The status flags on the main release menu will be updated with the release flag showing '1'.

If the release has not been armed first then the release flag will remain showing '0' and the release will not operate.

Once this message has been sent, it is important to wait for up to 5 minutes to allow the release to operate. If the release has failed to operate then try sending the JAM command instead, see section 7.6.

7.5 Priming the Release

On some release models it is possible for the release to automatically set the jaws back into the closed position. To send the prime command, from the release main menu press F1 followed by F4 and finally to prime the release, press the F2 key.

For further information on priming the release, consult the release operating instructions.

7.6 Using the JAM Command

The JAM command is used when a release has failed to operate using the normal release command. This uses anti jam techniques built into the release

to try and get it operating. To send the jam command, from the release main menu press F1 followed by F4 and finally to prime the release, press the F3 key.

For further information on using the jam command consult the release operating instructions.

7.7 Sending the Sleep Command

If the release is not going to be used as a transponder or where there are other beacons that use the same channel as the release, it is possible to stop it responding to the standard interrogation. This can be done by commanding the release to go into sleep mode. The normal release operations will subsequently work as normal but it will not be possible to range to it.

To go into the sleep menu from the main release menu, press F1 followed by F4 and finally F4 again. This menu gives the option command for the release to go into sleep mode and also to command the release to go back into normal mode.

To turn on the sleep mode press F1 and the PAM will send the sleep on command. If the release has correctly received the command the PAM will display the main release display with the sleep flag set to 1.

To turn off the sleep mode press F2 and the PAM will send the sleep off command. If the release has correctly received the command the PAM will display the main release display with the sleep flag set to 0.

7.8 Release Troubleshooting

Problem	Solution
Cannot range to the release.	<p>Check the mode and channel number is set properly.</p> <p>Check the Rx Gain and Tx Power have been set correctly.</p> <p>Ensure the release is not in sleep mode.</p>
Cannot communicate with the release	<p>Ensure the correct mode, channel and ID are set properly.</p> <p>Check the Tx Gain and Tx Power have been set correctly.</p>

8 Simrad Command Functions (option)

This software module enables the PAM to communicate with an SPT or MPT transponder. To go into the main Simrad command menu from the main menu, press F3 followed by F3 again.

PAM2520	Beacon = Trickle	11:09
Serial No. 2272	Channel No. 12	
Nav. Power High	Tel. Power High	
Rx Gain High	Pulse Width 10mS	
Serial Number	Power Set-Up	Change Channel Transmit

Simrad Command Main Menu

8.1 Setting up the Serial Number

For the PAM to successfully communicate with the SPT or MPT, it needs to know the serial number. To change the serial number, from the Simrad main menu press F1.

PAM2520	Beacon = Trickle	11:09
Use Left/Right to select Number Up/Down to change Number		
0 2 2 7 5		
Left	Right	

Change Serial Number Menu

To change the serial number, move the cursor to the digit you want to change by using the F1 and F2 keys. Press the up arrow key to increment the selected digit or press the down arrow key to decrement the digit.

Press the RETURN key to go back to the main Simrad menu.

8.2 Changing the Transponder Power and Receive Settings

To enter this menu press F2 from the Simrad main menu.

PAM2520	Beacon = Trickle	11:09	
Nav. Power	High	Tel. Power	High
Rx Gain	High	Pulse Width	10mS
Nav Power	Tel Power	Pulse Width	Rx Gain

To alter the Navigation power setting, hold down the F1 key and press the up arrow key.

To alter the Telemetry power setting, hold down the F2 key and press the up arrow key.

To alter the Pulse Width setting, hold down the F3 key and press the up arrow key.

To alter the Receiver Gain setting, hold down the F4 key and press the up arrow key.

Note: These changes will not effect the transponder until the data has been sent using the transmit menu.

8.3 Changing the Channel Number

For the PAM to successfully communicate with the SPT or MPT it needs to know the channel number. To change the channel number in PAM or to change the transponder channel number to a different one, from the Simrad main menu press F3.

PAM2520	Beacon = Trickle	11:09
Current Channel = 12		
New Channel = 12		
Current	New	

Simrad Channel Change Menu

To change the current channel hold down the F1 key and either press the up arrow to increase the channel number or press the down arrow key to decrease the channel number.

To change the new channel number, hold down the F2 key and either press the up arrow to increase the channel number or press the down arrow key to decrease the channel number.

8.4 Transmitting the Data to the Transponder

To transmit the changes to the transponder, from the Simrad main menu and press F4.

To transmit the new power and gain settings press F1. The PAM will display “Sending Message”. If the message has been received correctly the transponder will reply. If the transponder failed to receive the message correctly the PAM will display “Transponder – Message Not Received”.

To transmit the new channel number press F2. The PAM will display “Sending Message”. If the message has been received correctly the transponder will reply. If the transponder failed to receive the message correctly the PAM will display “Transponder – Message Not Received”.

To transmit the release command press F3. The PAM will display “Sending Message”. If the message has been received correctly the transponder will reply. If the transponder failed to receive the message correctly the PAM will display “Transponder – Message Not Received”.

9 Serial Communications

The PAM has a serial port which sends the results from the ranging, testing functions and the four rate pinger to a remote terminal. The serial port is set to the following protocol:

- 9600 Baud
- 1 Start Bit
- 1 Stop Bit
- No Parity

To connect the PAM to a PC use a straight 9 way female to 9 way female lead. The connections should be as follows:

<u>Pam 9 way D type</u>	<u>PC 9 way D type</u>
Pin 5 -----	Pin 5
Pin 2 -----	Pin 2
Pin 3 -----	Pin 3

To have the PAM to communicate with the PC, it needs to be enabled from the options menu. To go into the options menu, from the main menu press F2, followed by F4 and then finally F3.

PAM2520	Beacon = Trickle	11:09
F1 = Testing Serial Output - Off		
F2 = Pinger Serial Output - Off		
F3 = Ranging Serial Output - Off		
F1	F2	F3

By pressing F1 the testing serial output will toggle between on and off.

By pressing F2 the four rate pinger serial output will toggle between on and off.

By pressing F3 the ranging serial output will toggle between on and off.

10 Specifications

Size	350mm x 250mm x 120mm
Weight	5Kg
Temperature	Storage -10°C to 80°C Operating -5°C to 40°C
Mains Input	100 to 240V ac 50 to 60 Hz 1.3A
Connections	IEC for mains input RS-232 9 pin connector Auxiliary Transducer 3 pin Beacon Connector on front panel 6 pin transducer connector on front panel
Beacon Compatibility	AAE 600, 800, 900 Series Simrad HPR3, HPR4, HPR1507, HPR4LF Sonardyne USBL ORE Trackpoint II
Internal Battery	4 hours minimum 2.1 AH gel electrolyte (no airfreight restrictions)
Charge time	6 Hours
Charger Compatibility	All AAE beacons Simrad RPT and MHT Sonardyne 7656 ORE Multi beacons
Processors	Hitachi 16 bit running at 10MHz Texas Dual Core DSP running at 100MHz
RAM	12KB
ROM	512KB Flash 128KB EPROM
Tx Power	Three power settings up to 200W
Tx Frequency	10KHz to 120KHz in 25Hz steps
Rx Channels	Dependant on DSP Software
LCD	40 characters x 8 line LCD with back light
RS232	9600 Baud as standard on 9 pin D connector
Sound	Small piezo buzzer for signal detection

11 Shipping Details - Airfreight Information

The battery inside PAM with a GEL Electrolyte is **NOT DANGEROUS** to airfreight. However, the following statement must be added to your shipping documentation to comply with the current regulations:-

“The above item is fitted with a non-dangerous battery”.

12 Spares

We hold a complete range of spares for all our products which can be dispatched by return.

If you have any problems or questions concerning any of our products, please contact us at any time and we will do what we can to help. Always quote the model number and serial number when making enquires or placing orders for any of our products.

The following parts may be required:

Mains Lead	Order as IEC Mains Lead and specify plug required.
Test Transducer	Model 7905 Transducer
Standard Charger/Responder lead	PAM Charge Lead with VMG-4-F5
Large Burton Charger/Responder lead	PAM Charge Burton 2008
Small Burton Charger/Responder lead	PAM Charge Burton 1508
Responder Test Lead for ORE 4320A	PAM Responder Lead 4320A
Responder Test Lead for ORE 4330A	PAM Responder Lead 4330A
RS232 Interconnect lead	PAMII RS-232 Lead
Battery Pack	Battery Pack 2520
Case Handle	Handle Assembly for 2520
Fuse	20mm 2A Quick Blow
Power Supply	PAM II 24v Power Supply
Fan	PAM II Cooling Fan

13 Trouble Shooting

Problem	Solution
Mains LED off	Check Mains is switched on at wall socket. Check the Mains switch at the back of the PAM unit is On. Check the Fuse on the back of PAM has not blown.
LCD Backlight not on	The LCD backlight will only work when mains is switched on
LCD Screen corrupt or line appears on the display	The internal battery is empty, connect the PAM to the wall socket, and switch on at the rear of the PAM.



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