VOYAGE DATA RECORDER
VDR & s-VDR 2272-B

Data sheet updated 16/03/2006

LET'S KEEP IT SIMPLE

- VDR = voyage data recorder
- s-VDR = simplified voyage data recorder
- s-VDR uses the same hardware & software as the VDR. It's the same thing!
- s-VDR just has to record less information than the full VDR, reducing the cost of interfacing and cost of installation.
- The s-VDR can use a float-away EPIRB memory capsule instead of the strapped-down capsule.

From the IEC 61996-2 type approval document....

It is well to note that the IMO carriage requirement states that; "To assist in casualty investigations, the existing cargo ships, when engaged on international voyages, ... shall be fitted with a VDR which may be a simplified voyage data recorder (S-VDR)" indicating that existing VDRs should meet the carriage requirement.

The memory capsule is installed above the bridge.

The watertight main electronics unit is inside the ship, on the bridge or in an electrical room.

CONTINUOUS RECORDING 24/7, 365/1

The VDR, s-VDR, accepts and saves as digital data

- Ship's instrumentation such as GPS & gyro
- Bridge area audio
- Radar Picture (and/or AIS data)

The main electronics unit in its watertight enclosure.

44 x 32 x 18 cm

Designed to protect against freak waves swamping the bridge.

DATA STORAGE:

- **The VDR saves the last 12 hours of data in the capsule. This is the essential requirement of a VDR**
- **A "save incident" pushbutton causes the last 12 hours data to be saved for later analysis. This is another requirement of a VDR**
- Five incidents or more can be saved in the MEU before the oldest one is overwritten.
- 12 hours or more of the latest data is saved in the capsule and also in the main electronics unit.
- When you need a copy of any data just plug in your computer to the LAN port and copy the files you need. As simple as that.
- The VDR records without interruption during the copy-to-computer, save, or download process.

DATA TO BE RECORDED	VDR	s-VDR
Bridge audio & one VHF radio communications	✔	✔
Date, time, position (GPS)	✔	✔
Ship's heading (Gyro)	✔	✔
Speed (Log)	✔	✔
Radar picture	✔	Record radar if off-the-shelf RGB interface is available, otherwise, record AIS data
AIS	Not demanded	AIS not demanded if radar is recorded
Depth (Echo sounder)	✔	If IEC 61162, NMEA 0183, data exists
Engine demand & response	✔	If IEC 61162, NMEA 0183, data exists
Main alarms, fire alarms etc	✔	If IEC 61162, NMEA 0183, data exists
Watertight and fire door status	✔	If IEC 61162, NMEA 0183, data exists
Rudder order & response	✔	If IEC 61162, NMEA 0183, data exists
Wind speed & direction	✔	If IEC 61162, NMEA 0183, data exists
Hull stresses & acceleration	If ship so fitted	If IEC 61162, NMEA 0183, data exists

COMPACT, ROBUST, HARDWARE

- Main Electronics Unit (MEU),
- Bridge area microphones
- Battery backed power supply (UPS),
- Memory capsule (HVR or EPIRB).

OPERATION

Operation requires no action from the crew with the exception of the "save incident" operation which saves the last 12 hours data in a file in the MEU.

Data may be replayed on board or ashore. Replay software is available to run on a PC.

INTERFACING the DATA to the VDR, s-VDR

The data input channels are all NMEA 0183 (IEC 61162). So, equipment with an NMEA output can be connected directly. Modern equipment such as echo sounders and gyros all have an NMEA output.

If not, then it may be possible to fit an interface to convert it to NMEA 0183. AMI have a remarkable range of interfaces

- KW950 E with options for gyro, log, echo sounder, GPS, RPM. More than 60 options!
- KW910 synchro interface for gyro, telegraphs, rudder
- KW932 32 channel interface for alarm systems, fire and watertight doors

The picture above shows four 32 channel interfaces for an alarm system, plus a rudder angle synchro interface.

- KW935 4 channel voltage or 4-20 mA interface. Telegraph, rudder, thrusters
- KW909 PPI parallel port interface for intercepting engine information printers, and hull stress data
- KW909 SPI for interfacing proprietary serial data from, for example, fire alarm systems
- KW909 FM, 8 channel data combiner. 8 channels in at 4800 and 1 out at 38400. (+ daisychain!)
- NAVTALK NMEA 0183 distribution interface. 10 channels out.

RADAR INTERFACING. The radar acquisition interface (RAI) connects to true RGB compliant signals.

If the radar does not have VESA standard RGB signals then the radar maker might be able to supply an interface.

If a commercial off-the-shelf (COTS) RGB interface output is not available from the radar manufacturer then the s-VDR rules allow an AIS input to be used instead.

BRIDGE AREA MICROPHONES: These are highly sensitive, self-adjusting microphones. You do not need many to cover a ships bridge.

VDR s-VDR COMPREHENSIVE FEATURES

- Exceeds ALL IEC 61996 requirements
- Cost effective
- Compact and lightweight in construction
- Watertight ABS enclosure for MEU
- Plain language 2-line LCD display
- 18 LEDs monitor input & output activity
- Save-incident push button
- 24v battery-backed AC-DC power supply
- AIS input channel
- Data inputs easily expanded
- Highly sensitive self-adjusting microphones
- Remote alarm available 100 x 50 x 25 mm
- Software updates using plug-in memory stick
- Copy the data via Ethernet to a PC.
- Within the MEU is available
    1. A copy of the capsule's data & typically more than 24 hours data
    2. 4 or more 12-hour incidents.

EQUIPMENT INTERFACING:
There are sometimes instances when it is not possible to interface ship's equipment, an example being an echo sounder, which has no electronic signal output.

Otherwise, "You name it, we interface it"

Unfortunately the ship sometimes has to fit a new piece of equipment such as a radar or echo sounder, to get the electronic output necessary. This expense is not part of the VDR.

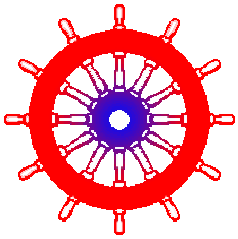
VHF RADIO INTERFACING.
The VR2272B has a transformer-isolated line input port for connection to a VHF's audio output. A "direct connection" is called for in IEC 61996 but if the radio does not have an audio output for external use, then connection can not be made.

For the Sailor RT2048 the AMI 2049 type-approved interface is available.

Unofficial modifications are not permitted. This may lead to the owner having to fit a new VHF.

FULLY COMPLIANT. TYPE APPROVED.

The VR2272 VDR is fully compliant with IMO resolution A861.20, EC directive 1999/35/EC, SOLAS Chapter V, IEC 61996, IEC 61162 and IEC 60945. EU RoHS directive etc.



Approved as VDR.

At this date the type approval specification document 61996-2 for s-VDR is still not finalised.

VDR s-VDR TECHNICAL SPECIFICATIONS

DATA INPUT:

- 1 channel for interfaces or AIS at 38400 baud.
- 8 channels NMEA 0183, IEC 61162 at 4800 baud
- GPS, heading, speed & echo sounder channels are assigned and filtered to reduce the amount of data passed.
- GPS must deliver either ZDA or RMC sentence to update the date and time.
- Pluggable terminal block connectors

AUDIO INPUT

- 3 audio ports combined to one channel
- 3 audio ports combined to a 2nd channel
  - One of these is transformer isolated
  - It is usual to use this for VHF radio
- Microphone 100 x 50 x 25 mm
- 6 way pluggable terminal block connectors
- Cable screens ground on M3 screws

RADAR ACQUISITION INTERFACE

- The table shows the type of VGA RGB signals that are accepted.
- VDRs are not required to be able to connect to any other type of radar output.
- Video input is a standard RGB 15 pin D-socket as found on a PC

- AMI can also interface radars with a DVI digital video interface, subject to trial and consultation.

1. **L3 MEMORY CAPSULE**
   a. L3 communications HVR
   b. Height 330 mm. Dia 203 mm
   c. Weight 17 Kg

2. **KOTEL MEMORY CAPSULE**

3. The following manufacturers are expected to provide capsules which can be used with the s-VDR. At 16/03/2006 they have not made them available to us.

   a. ACR Electronics
   b. McMurdo

REMOTE ALARM UNIT

- 100 x 50 x 25 mm ABS box
- 60 dBA audible alarm
- Red flashing led

VDR s-VDR TECHNICAL SPECIFICATIONS

MAIN ELECTRONICS UNIT

- Sealed polycarbonate enclosure
  - 44 high x 32 wide x 13 cm
  - EMC enclosure 30.5 x 21.5 x 11.5
  - Weight 4 Kg

- **ACCESS SPACE REQUIRED**
  - 15 cm above the top and 15 cm on the right hand side
  - This is because the side panels are removable for essential maintenance.
  - Suggested 15 cm space below for the cables to enter

POWER SUPPLY KW914B

- AC 115/230 volts 50/60 Hz 35VA
  - 15 high x 21 wide x 11.5 deep
- Uses Yuasa batteries, made worldwide

Pixels	Frequency
720 x 400	70, 85Hz
640 x 480	60, 70, 72, 75, 85Hz
800 x 600	56, 60, 70, 72, 75, 85Hz
1024 x 768	60, 70, 72, 75, 85Hz
1152 x 864	60, 70, 75, 85Hz
1152 x 900	66, 76Hz
1280 x 960	60, 85Hz
1280 x 1024	60, 70, 75, 85Hz VDRs are not required to connect to radars with larger screen sizes
1600 x 1200	60, 65, 70, 75, 85Hz may be possible, but consult first.

EXTRACTING THE DATA FOR REPLAY

- RJ45 LAN port for a PC to plug in
- Copy the data over the local area network onto your laptop PC.
- Uses “companion software” via icon on the PC to make copying very easy.

REPLAY SOFTWARE

- All data files can be read, viewed and listened to using a Windows PC. *No special software is needed.*
- AMI-GEONAV and ESL AIS replay software for Windows PC will give the full replay facility.

ALARM AND STATUS OUTPUT

- Isolated low power change over relay
- All three contacts available
- Held energised when there is no alarm

- Accept-alarm switch
- 4 core screened cable required
- This is an optional extra, in case the VDR is not fitted on the bridge.

QUESTIONS & ANSWERS
Check www.v-d-r.net for the answers to many questions

This data sheet was LAST UPDATED 16/03/2006 by me, the s-VDR's designer, Andrew Fairgrieve.
All feedback is warmly welcomed.
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The Original VDR 2272 was known as the Full Monty and the RAI was Monty2. This s-VDR update is known as Monty 3. It uses all the same well-proven techniques, circuits and software but has been made more compact.

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