

12kHz transducer
Originated by John Ahern (LUMCON) on December 13, 2012

On 12/13/2012, John Ahern (LUMCON) wrote:

Hello All,

We've been having some trouble with our echosounding equipment. We have a Knudsen 320B/R with an airmar M190 12kHz, and SS216 100kHz transducer. We are unable to get returns past about 1000m which is not within spec. I've spoken with Darren Gibson at Knudsen who offered some ideas including using their echosym transducer tester. I am currently trying to borrow one. But it would also be useful to hang a 12kHz ducer over the side and see how that does. We did send our deck box back to Knudsen and it checked out fine so the problem is somewhere else. If anyone has equipment we can borrow please let me know.

also, I'm compiling the results of my oil detection message and will send that out as well.

Thanks
John

Reply From: Shailer Cummings (NOAA) on 15 Dec 2012

John -

Check the integrity of the cable and connectors. It is possible that connectors have corrosion or cable conductor insulation has deteriorated with age. Knudsen should be able to provide you with a resistance measurement range across the transducer. If this measurement is made through the transducer cable at the disconnected deck box connector, you will check the connector, cable and transducer in one step. If your measurement is out of range you will have to dig more.

Good Luck,

Shailer Cummings

Reply From: Dale Chayes (LDEO) on 18 Dec 2012

On Dec 13, 2012, at 11:30 , John Ahern wrote:

> Hello All,
>
> We've been having some trouble with our echosounding equipment. We
> have a Knudsen 320B/R with an airmar M190 12kHz, and SS216 100kHz
> transducer. We are unable to get returns past about 1000m which is
> not within spec.

It would help if you could clarify whether it has never worked "right" or if it used to and doesn't any more.

> I've spoken with Darren Gibson at Knudsen who
> offered some ideas including using their echosym transducer tester.

As I recall, there was a plan (don't know if it was executed) to purchase a transducer test box.

I assume that if it had been bought, the responsible party would have spoken up by now and offered to send it to you.

That said, I'm not a big fan of the "use a test box" approach because:

1) you don't have to actually know what's going on,

and more importantly,

2) you are unlikely to have it when you need it (e.g. at sea)

If you make the measurements (to establish a baseline) with your own tools (and document the procedure) when it's installed and the at-sea acceptance test shows that it works right, then you can repeat the measurement when something "isn't right" any more.

> I am currently trying to borrow one.

Most of the useful tests can be made with test equipment that you have (or should have) on hand:

- a decent multimeter
- a megger
- a scope (simple analog will work fine)
- a signal generator
- a decade resistance box

Since you are concerned w/ 1,000 meter depths, I assume you are worried about the 12 kHz performance.

Airmar has a decent data sheet for the ducer at:

www.airmartechtechnology.com/Uploads/NavSurv/NS_M190.pdf

but it does not (unfortunately) include a graph of the expected (specified) impedance vs frequency. It does imply that the impedance at 12 kHz is 60 ohms.

Syqwest has a PDF on their web site that describes how to measure the impedance with common test equipment (from the list above) at:

www.syqwestinc.com/support/Transducer_Cable%20checks.pdf

Note the warning about using the 1kV range directly into the 'ducer. This is a good reason to have a multi-voltage megger.

Before the megger and the impedance measurement, start with a decent multimeter and check:

- for grounds (the two 'ducer connections" and the shield
- for resistance across the 'ducer leads
- for the capacitance across the 'ducer

If there is no transformer in the 'ducer, it will "look" (electrical) like a small capacitor: very high resistance and a small, stable capacitance. But remember to take the cabling into account. For a long cable, the capacitance of the cable will be bigger than the 'ducer.

- > But it would also be useful to
- > hang a 12kHz ducer over the side and see how that does. We did send
- > our deck box back to Knudsen and it checked out fine so the problem is
- > somewhere else.

The likely suite of candidates include:

- the transducer itself which is unlikely unless it has been physically damaged, very old, or encrusted
- cabling (including electrical shielding, and wiring)
- ship noise (machinery and/or flow induced)
- electrical interference
- acoustic (in water) interference from ship, machinery or other electronics
- transducer mounting & acoustic coupling

Please let us know what you learn,

-Dale