

## Re: Audio Tachometer for 2 stroke engine

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*Source:* <http://sci.tech-archive.net/Archive/sci.electronics.design/2005-04/msg04859.html>

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- *From:* nospam <nospam@xxxxxxxxxxxxxxxx>
  - *Date:* Wed, 27 Apr 2005 01:30:00 +0100
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Ross Herbert <rherber1SPAMEX@xxxxxxxxxxxxxxxx> wrote:

>>It likely doesn't need to filter out much at all. The rapid opening of a  
>>two stroke exhaust port to release the results of a recent explosion  
>>produces a huge pressure impulse. I would not be surprised to find it 10's  
>>of db larger than any other source although I am assuming these high  
>>performance models do not have silencers.

>While this is true the fact remains that any spurious and random noise  
>source would interfere with the wanted sound. It is not simply a  
>matter of detecting the amplitude of the desired signal. Since an  
>electret is extremely sensitive to both sound and physical vibration,  
>and is physically mounted in the boat which is speeding (hopefully)  
>over the water, it will pick up every sound and vibration, including  
>harmonics and sub-harmonics, wanted or not. Filtering would not be as  
>easy as hoped for, I imagine.

If someone fires a gun next to you head you are telling me you might not be able to count how many times because of someone rattling plates or having a conversation on the next table?

If the impulse is 10 times larger than any other signal you don't need fancy circuitry to detect it and ignore everything else.

>>My biggest worries would be the risk of hearing reflections of itself in a  
>>resonant exhaust system, and the dynamic range of the microphone, even  
>>mechanical damage to the microphone.

>Aha!, you are tending to agree with the gist of my criticism.

Not really just speculating that if you put a microphone somewhere near the end of the exhaust the impulse would be so loud that it would exceed the dynamic range of a normal microphone and possibly damage it. If I were doing the job one of the things I would try is using an element from a piezo sounder as a pickup.

>>The OP should record a sample from a running engine and see what it looks  
>>like. He might also consider using a directional microphone from the shore.

## Re: Audio Tachometer for 2 stroke engine

>Assuming that one could design a system as proposed, the final test of  
>accuracy and reliability has to be realised. After extensive bench  
>testing it would need to be tried in practice on the water. If all  
>goes well, the tacho will record the rpm as intended, but, how will we  
>know if the readout is accurate?

Because one can't see any mechanism in the system to give a consistently inaccurate readout and you already know approximately what the readout should be?

>We would need to have some known  
>accurate system to compare the readings against, wouldn't we? What  
>this means is that you would also have to install a reference system,  
>one which is known to be free of all of the negative aspects I have  
>referred to,

and how would you know that system is free from those aspects, and free from other negative aspects you didn't refer to?

>and is tried and proven to accurately measure rpm of the  
>motor or drive shaft.

And how did you prove this other system accurately measures the motor rpm?

With another system you haven't proven either?

At some point you have to say if it quacks like a duck it is a duck and in this case duck quacks are not that hard to recognise.

>This implies that a known reliable non-contact method such as magnetic  
>hall-effect (pulse), or opto reflective method must be used as the  
>signal source because these methods are well established and widely  
>used to perform the same function in industry already. Having said  
>that, doesn't this suggest that if there is already a reliable system  
>of deriving the required rpm data with which to compare that obtained  
>by the new "audio based" system, then why do we need the new system in  
>the first place?

Because the system the OP proposes can be stuck on (and removed from) any boat with no modifications to the boat other than adding a bit of sticky back velcro. That is why I suggested he considers listening from the shore which is even more convenient.

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### • *References:*

◆ *Audio Tachometer for 2 stroke engine*

◇ *From: Mook Johnson*

◆ *Re: Audio Tachometer for 2 stroke engine*

Re: Audio Tachometer for 2 stroke engine

◇ *From:* BobG

◆ ***Re: Audio Tachometer for 2 stroke engine***

◇ *From:* nospam

- Prev by Date: ***Re: sealed (air tight) rechargeable battery technology***
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