BUCKET ROTOR WIND-DRIVEN GENERATOR

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One of the common types of impellers for moving large volumes of air at low velocity is the bucket rotor. Perhaps we have overlooked the possibility of using this design in reverse for the extraction of power from the wind.

To get some preliminary feel for this, a unit with rotor 4 feet in diameter and 4 feet long has been built (see figure 1). It has deflectors on the top and bottom to guide the wind into the top half. The lower deflector also shields the back side of the bucket from the wind, thus reducing the reversing wind force. The present rotor is fixed in direction facing the predominant wind; it may also be mounted and installed with a tail boom to follow the direction of the wind.

Mounted on a trailer towed by an automobile, this unit has been tested at wind speeds from 15 to 40 mph. The mechanical energy produced was measured using a rather crude dynamometer. The maximum power at 40 mph was measured to be 0.14 horsepower. Further improvements in the configuration design will undoubtedly improve the performance.

As compared with the ordinary propeller-type rotor, the bucket rotor is limited in rotational speed since the tip rotor speed can never exceed the wind speed. However, it does not present the blade fatigue problem that the ordinary rotor does, and it perhaps causes less sight pollution. The deflector vanes also provide a venturi passage to capture greater wind flow. The bucket rotors can be strung together end-to-end up to thousands of feet long to produce large amounts of power.

DISCUSSION

Q: This is simply a Savonius rotor on its side with a couple of vanes out front to direct the flow. The disadvantage is that it's directional.

A: It is directional, certainly, but because it is directional, the

vanes here have the Venturi effect that simply improve the efficiency of the thing.

Q: Right, but, if radial vanes are mounted on a Savonius rotor it captures the wind from all directions, the effect is the same.
A: But the Savonius rotor has a vertical axis. However, if you are free of directional influence, you cannot put in those guide vanes.

Q: You could put them in as part of your supporting structure. They would hold the upper bearing of the vertical axis. I don't see how your rotor is any improvement over the Savonius rotor with guide vanes.

Figure 1

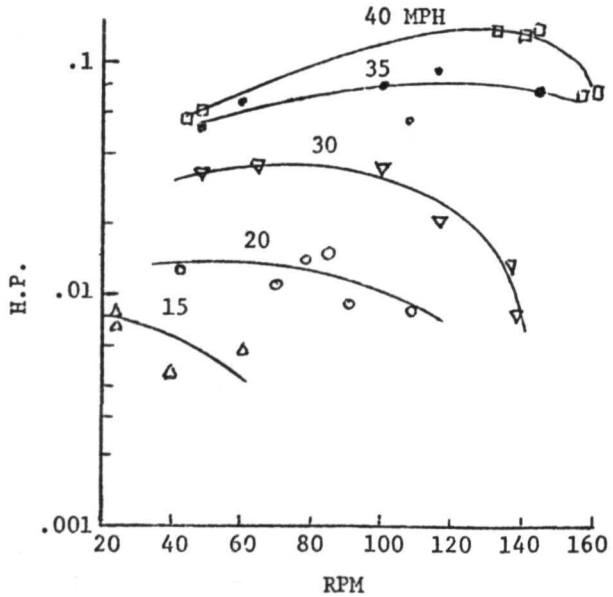

Figure 2. - Test results of the bucket rotor wind-driven generator.