



DCRC Club Meeting
Friday 8/21/09 7:30 PM
Montgomery County
Council building
100 Maryland Ave
Rockville, MD
Meeting program:

August 2009

Meeting Raffle:
Nir Schweizer

NEWSLETTER

Volume 55, Issue 8

DCRC 2nd ANNUAL RUDDER-ONLY FLY IN



PRESIDENT: Andy Kane

V.P. Dave McQueeney
 County Liaison: Jim McDaniel

BOARD OF DIRECTORS

Scott Davies 301-770-9150
 Mike Dooley 301-843-8818
 Andy Finizio 301-983-8557
 Allan Hoffman 301-845-8485
 Andy Kane 301-785-3022
 Jim McDaniel 301-916-0366
 Dave McQueeney 301-330-9385
 Mike Peizer 301-589-8299
 Nir Schweizer 301-972-2248

TREASURER:

Scott Davies

MEMBERSHIP SECRETARY:

Andy Kane
 305 Natick Court
 Silver Spring, MD 20905-5875

RECORDING SECRETARY:

Doug Harper

SHOW TEAM MANAGER:

Jim McDaniel &
 Allan Hoffman

NEWSLETTER EDITOR:

Andy Kane 301-785-3022
 drceditor@aol.com

MEETING PROGRAM COORDINATOR:

Dave McQueeney

OFFICIAL CLUB PHOTOGRAPHER:

Thomas Pfarr

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www.dc-rc.org

Did you know that any airplane brought in to the model shop will receive 3 free raffle tickets. Bring in your models each month for your free tickets, and to share ideas.

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Cover:

Some of the guys photo by Tom Pfarr's Camera

Second Annual Rudder-Only Fun Fly

BY DON GRAY



DCRC 's 2nd Annual Rudder-Only Fun Fly was held on Sunday, July 19th, at Walt Good field. The weather could not have been more perfect. We were blessed with light winds, clear skies, comfortable humidity and temperatures in the lower to mid eighties. There were over thirty attendees, including two club board members. The number of registered pilots was down from a year ago. Someone mentioned that there was another local electric event that may have been a failure. However, One modeler and his wife left there home in upper state New York at 3 AM Sunday morning so they could attend. WOW, that's what I would call a serious R-O junkie.

There were two or three true rudder only models. Other pilots with planes equipped with elevators were on the honor system to fly with just rudder, unless they got into trouble. The majority of the models were electric and except for Ed Leibolt's converted Sig Kadet, were of the small to median size. As I recall, there were no radio issues.

I think the highlight of the day was lunch. Everyone I talked with indicated how much they enjoyed the meal along with the relaxing pace of flying these types of models.

I would like to thank all of you who helped out before, during and after the event. Once again, a special thanks to Tom Pfarr for taking the nice photos, which are available for viewing on our website. I have included a few of them here as well.

Fore next year, we may try something a little different to see if we can get a little better turnout of pilots. However, I have it from a reliable source that we did have more fliers than at this year's Heritage Day.



Gus Corsetto's beautiful Stinson L-5 he built from Roy Day's plans.



Bill Savage's Cornett (late 30's design).



Tom Pfarr's colorful and majestic electric



My 40-year old Goldberg Skylane powered by a Cox .049.

July Club Meeting Minutes

BY DOUG HARPER



The meeting was called to order at 7:38PM by President Andy Kane. Andy asked for introduction of guests or new members. John Golden and Jay Harbour were visiting. They stopped in DC on their way to Afghanistan tomorrow to fly UAVs. Also, Gad Schweizer, Nir's Dad, was visiting to celebrate the birth of the new Schweizer baby, Taylor Rose. Josh Obriant and Jeryn Koritzinsky, two engineering students from George Washington U, are looking for a pilot to help fly two planes in formation. Albert Jenner, 14, is ready to start flying RC. Mark Goldsman is a new member. All were welcomed.

After this, Andy showed a video titled "What did you do on your Summer vacation"? It showed him, riding on a boat with a bunch of wild people, in an unknown body of water. They launched an electric T-28 foamy from the boat and then proceeded to chase it all over. Eventually, they retrieved the model by driving the boat up under it as Andy brought it down.

Treasurer: Andy reported two expenses over \$100.

Field Maintenance: Allan reported that the new road is finished. No more dust!

Events: Andy Finizio reported that County Heritage Day was a great success. He encouraged the club to support activities like this. We will look at next year to see how to get more club involvement. The County values our efforts in this activity. The food was great and all had a great time.

This Sunday is the second annual DCRC Rudder Only event. Don

Gray is the CD and welcomed all to turn out. Planes with more than rudder can fly under the honor system. Don expects a good turnout including people from out of state. Food will be provided at the field.

There is a two-day IMAC contest in Hagerstown next weekend. The following weekend there is a jet fly in Lebanon, PA.

Sound and Safety: Nir reported that a new sign is being put up for the first aid kit.

New Business: Maynard Hill reported that DCRC has a member who was a significant part of the US space program. Andy read a letter written by Roy Day outlining his many activities as a long-time employee of NASA. He was a key part of many programs including the Apollo program (man on the moon) and the Space Shuttle. Roy was given a round of applause for his interesting career.

Roy Day reported that Dave Shaw, a long-time member, was in the hospital and rehab recovering from a serious infection. Dave is slowly getting better. Roy passed a card among the membership to be sent to Dave.

Raffle: Nir has two foamies for tonight's raffle. Nir surprised the club by introducing a delta wing 60-powered aircraft as the third raffle prize. This plane was owned by Mike Dooley. This resulted in more ticket sales.

Maynard Hill drew the winning ticket which was owned by Ira Glikman who selected the delta. Ira then drew the next ticket which was owned by Walt Gallagher. The final

ticket was pulled by Albert and was won by Mark Goldsman.

Model Shop: Gus presented an L5 Stinson that he built to take pictures from above. His model has a 51" wingspan and uses a 400 motor driving an 11X8 prop. He said it flies great.

Don Gray showed a foamy Hellcat that he built from a Great Planes kit. It has real Navy markings and uses an Axi motor. He likes the way it flies.

Walt Gallagher presented a plastic cleaner made by Plexus that he likes. It sprays on and wipes right off. Walt uses it on many items around the house and it works well. Walt learned about this product from Jim McDaniel. It can be found in auto and motorcycle stores. Walt bought his from Amazon.

Program: Ira Glikman decided to do something different tonight so he picked the subject "Searching for Stuff on the Internet". Ira started by showing the RC Universe internet page.

Ira likes RC Universe since it contains many products for sale or information forums and has a very easy to use search capability. Ira showed how one falls down thru the search tree.

Ira then showed how to use the "review" function in RC Universe. He uses this often to see what others think about a product he is interested in. He showed how to find various products and see what people wrote about them.

Ira then moved to the Hobby Lobby page to show the features they have for a modeler.

Ira received a round of applause for his presentation.

The meeting was adjourned at 8:57PM.

July Board Meeting Minutes

BY THOMAS PFARR



The meeting was held at Walt Good field and was called to order by President Andy Kane at 7:25 PM. In attendance were Andy Kane Jim McDaniel, Andy Finizio, Tom Pfarr, Alan Hoffman, Dave McQueeney, Scott Davies and Nir Schweizer. Doug Harper was not available so the minutes of the previous meeting were not discussed. There was no discussion of old business.

Events - Andy Finizio presented the financial results for Heritage day/ Count appreciation day. The total cost outlay was \$442.21 which was less than last year's event costs.

Treasurer's Report - There were two checks written over \$100.

County Liaison - Jim McDaniel reported that Peggy Erickson who is the director for Heritage Montgomery program was very pleased with DC-RC's participation in this year's event. She attended the event at the field for several hours and was very enthusiastic in her praise of the activities presented at the field for the enjoyment of the public.

Field Maintenance - Bids for jobs to re-seal the runway surface are being solicited. If the cost is appropriate the plan is to try and schedule the work for the fall of this year.

Sound and Safety - A new sign detailing the field address and

the directions to emergency services from the field was shown and approved to be posted at the impound. A short discussion of additional safety procedures and/or equipment that might be desirable at the field concluded with the fact that the new fire station emergency response is now only 2 miles from the field and ensures quick response for any emergency at the field.

New Business - Dave McQueeney announced a request by local boy scout troops to be able to attend one or more of the DC/RC training days as a scouting event to introduce the boy scouts to the hobby. The time frame for this activity would be in spring of 2010.

A discussion was held on requests by members to change the position of the safety fence on the taxi-way nearest to the field entrance (to the left of the transmitter impound). The left edge of the fence is near to the taxiway coming off of the runway and a request to move the edge of the fence further to the right was evaluated. The board agreed that the fence should be relocated and will coordinate with affected club members to work out the details and work crew to make it happen.

The meeting was adjourned at 8:15 PM

Model Propellers - Part 4, Matching Propellers to Engines

By Bill Garner



The description in Part 3 provides a means for examining the performance of a propeller in isolation but is of little use without taking into account the additional limitations when attached to an engine. Glow-fueled engines (the only ones included here) have maximum power and rpm limits that in turn restrict to some degree the propeller dimensions and performance for a given airplane. **Figure 4-1** is a graph illustrating how power and torque vary with rpm for typical 2 and 4-stroke engines having the same maximum power.

Figure 4-1 Typical Engine Power & Torque Curves

Brake horsepower is the maximum power that an engine can produce at a given rpm without stalling. Hence it is a not-to-exceed limit. Practically the maximum usable power is somewhat less than this value.

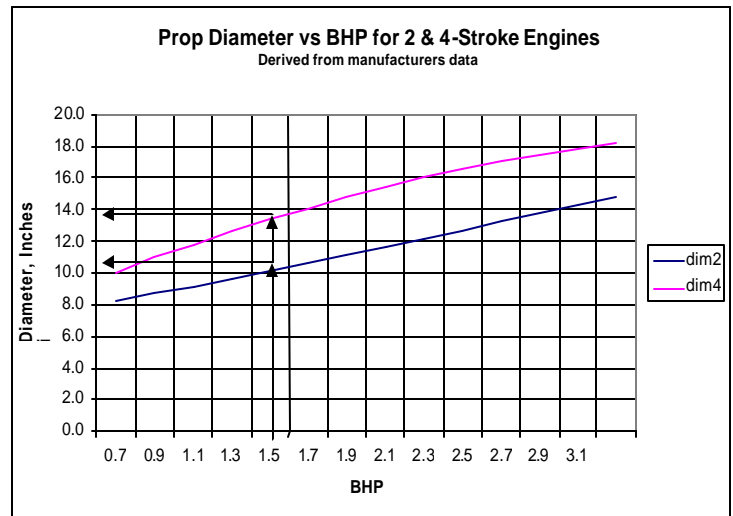
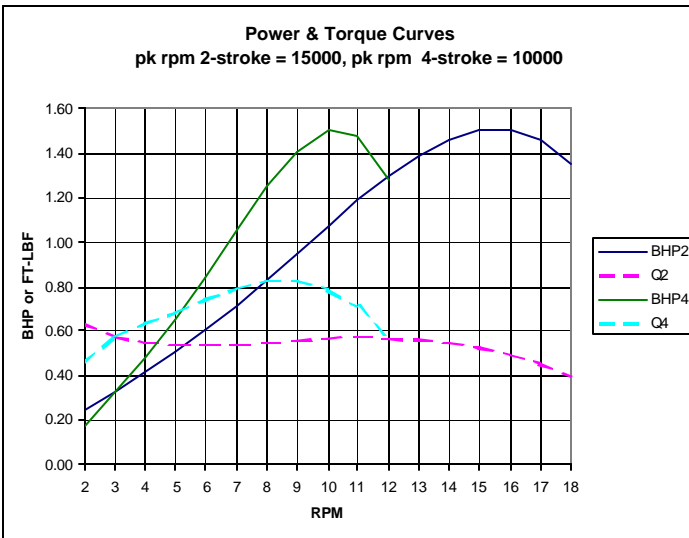
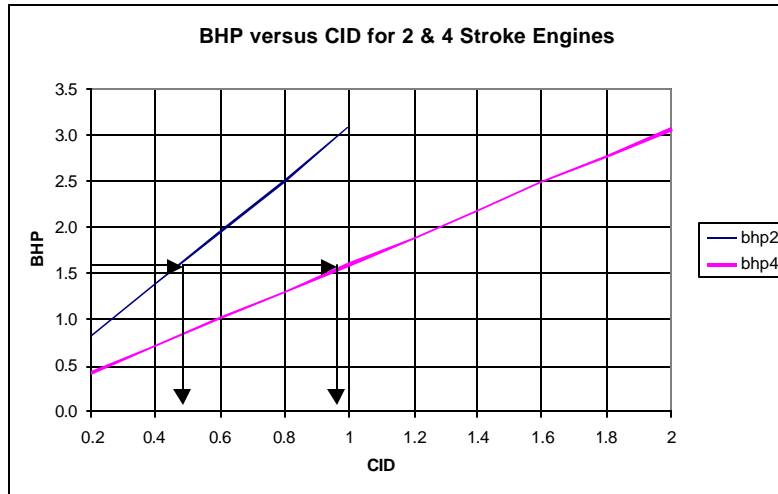
finest the torque or visa - versa. In fact, power is determined by measuring torque and calculating the power.

The peak torque of the 4-stroke engine is greater than that of the 2-stroke engine so the 4-stroke can generate more twisting force and therefore support a larger diameter propeller.

An issue for determining what size propeller to use with a given engine is determining what the BHP is given only

Because there are so many variables in relating propeller dimensions to performance for a given engine and because the theory is complex, the author has been unable to find a satisfactory way of analytically selecting propellers without a computer program. An alternative is to use engine manufacturer's propeller recommendations. **Figure 4-3. Nominal Recommended Propeller Diameter**

for a Given BHP Requirement
Figure 4-3 plots recommended starting propeller diameters as a function of BHP for 2 & 4 stroke engines. The recommended



Power and torque are related according to Equation 4-1.

$$Eq. 4-1. \quad P = \frac{2pnQ}{33000} \quad hp$$

Q is in ft-lbf

n in rev/min

Knowing the power automatically de-

termines the cubic inch displacement (CID). **Figure 4-2** provides an estimate of this relationship derived from available engine data sheets. The curves are a best linear fit to the data available. There was some small variation around these curves, probably caused by slightly different implementations.

propellers were found listed against CID and then using **Figure 4-2**, **Figure 4-3** was derived. The arrows indicate the recommended starting propeller diameters for a BHP of 1.5 HP; 10 inches for the 2-stroke and 14 inches for the 4-stroke. The pitch to diameter ratio for these propellers varies somewhat in the range from about 0.45 to 0.6. An interesting observation about

the data available is that for the same CID the recommended diameters are nearly the same, the 4-stroke being typically 1-inch greater. **Tables 4-1 and 4-2** list the propeller data from which **Figure 4-3** was derived. These charts were copied from reference 5.

Table 4-1. Prop Chart for Two-Stroke Glow Engines

Alternate Propellers	Starting Prop	Engine Size
5.25x4, 5.5x4, 6x3.5, 6x4, 7x3	6x3	.049
7x3, 7x4.5, 7x5	7x4	.09
8x5, 8x6, 9x4	8x4	.15
8x5, 8x6, 9x5	9x4	.19 - .25
9x7, 9.5x6, 10x5	9x6	.20 - .30
9x7, 10x5, 11x4	10x6	.35 - .36
9x8, 11x5	10x6	.40
10x6, 11x5, 11x6, 12x4	10x7	.45
10x8, 11x7, 12x4, 12x5	11x6	.50
11x7.5, 11x7.75, 11x8, 12x6	11x7	.60 - .61
11x8, 12x8, 13x6, 14x4	12x6	.70
12x8, 14x4, 14x5	13x6	.78 - .80
13x8, 15x6, 16x5	14x6	.90 - .91
15x8, 18x5	16x6	1.08
16x10, 18x5, 18x6	16x8	1.20
18x8, 20x6	18x6	1.50
18x10, 20x6, 20x8, 22x6	18x8	1.80
18x10, 20x6, 20x10, 22x6	20x8	2.00

Table 4-2. Prop Chart for Four-Stroke Glow Engines

Alternate Propellers	Starting Prop	Engine Size
9x5, 10x5	9x6	.20 - .21
10x6, 10x7, 11x4, 11x5, 11x7, 11x7.5, 12x4, 12x5	11x6	.40
10x6, 10x7, 10x8, 11x7, 11x7.5, 12x4, 12x5, 12x6	11x6	.45 - .48
11x7.5, 11x7.75, 11x8, 12x8, 13x5, 13x6, 14x5, 14x6	12x6	.60 - .65
12x8, 13x8, 14x4, 14x6	13x6	.80
13x6, 14x8, 15x6, 16x6	14x6	.90
14x8, 15x6, 15x8, 16x8, 17x6, 18x5, 18x6	16x6	1.20
15x6, 15x8, 16x8, 18x6, 18x8, 20x6	18x6	1.60
18x12, 20x8, 20x10	18x10	2.40
18x10, 18x12, 20x10	20x8	2.70
18x12, 20x10	20x10	3.00

Example Thrust and Engine Power Calculations

The preceding information can be used to estimate the thrust and engine power required as a function of forward velocity for a specific example.

Assumptions

4-stroke engine, .91 CID, peaks atrpm = 10000.

From **Figure 4-1** BHP = 1.5 hp.

From **Table 4-2** the start propeller size is 14x6.

The defining equations are as follows:

$$T = Ct \times r \times n^2 \times D^4 \quad \text{lbf}$$

$$Ps = Cp \times r \times n^3 \times D^5 / 550 \quad \text{hp}$$

$$J = \frac{V}{nD}$$

In these equations n is in revs/second, D is in feet, V is in feet/second

Then:

$$n = 11000/60 = 183 \text{ rps}$$

$$D = 14/12 = 1.17 \text{ ft}$$

$$nD = 183 \times 1.17 = 254$$

$$V_{\text{ftps}} = V_{\text{mph}} \times 1.467$$

And:

$$T/Ct = (.002378) \times (183)^2 \times (1.17)^4 = 147.5$$

$$Ps/Cp = (.002378) \times (183)^3 \times (1.17)^5 / 550 = 58.1$$

Process:

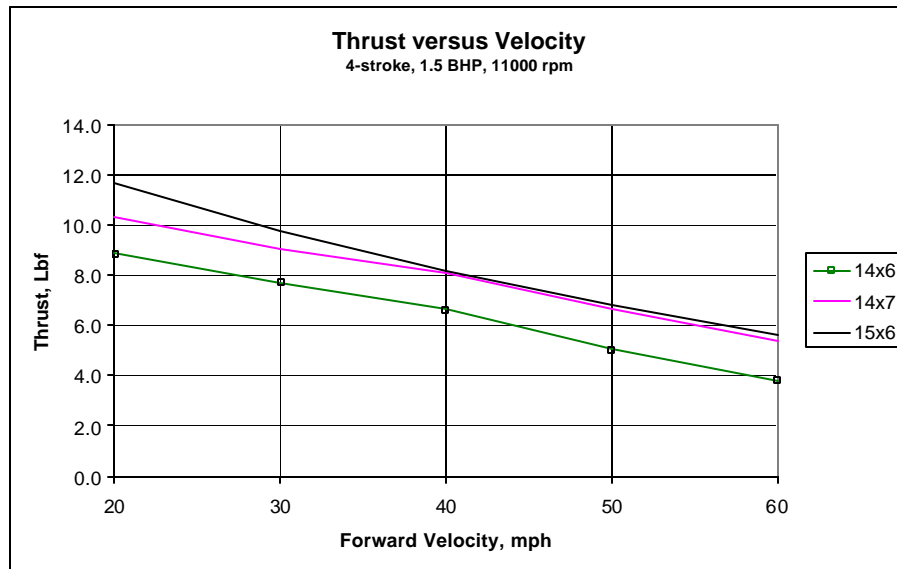
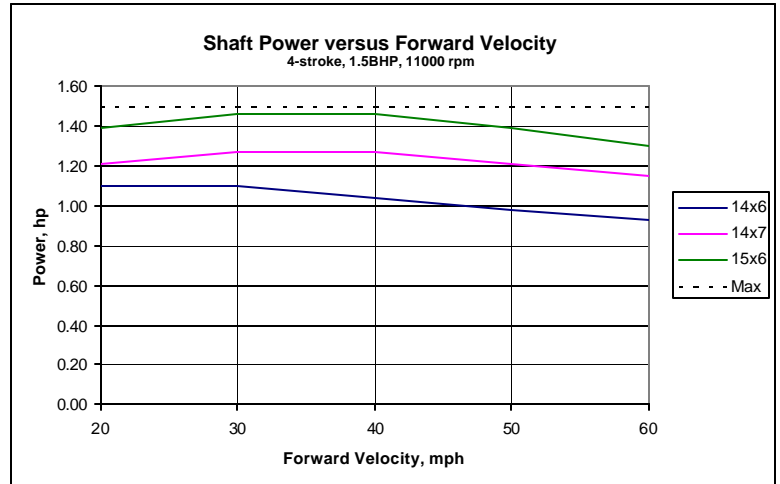
1. For each Vfps calculate J
2. For each J find Ct from **Figure 3-1** and p/D = 6/14 = .43 (interpolate)
3. Calculate T = Ct x 147.5
4. For each J find Cp from **Figure 3-2** and p/D = .43 (interpolate)
5. Calculate Ps = Cp x 58.1

Table 4-3. Example Calculation of thrust and engine power as a function of velocity

Vmph	Vftps	J=Vftps/254	Ct	T=147.5°C t	Cp	Ps=58.1*Cp
20	29.3	0.14	0.06	8.9	0.019	1.1
30	44.0	0.21	0.052	7.7	0.019	1.1
40	58.7	0.27	0.045	6.7	0.018	1.0
50	73.3	0.34	0.034	5.0	0.017	1.0
60	88.0	0.41	0.026	3.8	0.016	0.9

This process can be repeated for other propeller dimensions. **Figure 4-4** plots the thrust results for pro-

Figure 4-5. Example Engine Power versus Forward Velocity



pellers of dimensions 14 x 6, 14 x 7 and 15 x 6. **Figure 45** plots the shaft power results for the same combinations.

Figure 44. Example Thrust versus Velocity Graph

Using the 14 x 6 propeller as a reference, increasing the pitch by one inch from 6 to 7 while keeping the diameter at 14 inches increases the thrust by approximately 25%. Increasing the diameter from 14 inches to 15 inches while keeping the pitch at 6 inches increases the thrust by about 25% at the higher speeds but increases it by more than 30% at the lowest speed. More will be said about this phenomenon in a discus-

The shaft power does not vary much with velocity. Increasing the pitch from 6 inches to 7 inches (a 17% increase in pitch) increases the power demand by about 20%. Increasing the diameter from 14 to 15 inches (an increase of 7%) increases the power by about 30%. The power requirement of slightly less than 1.5 hp is probably not achievable with this engine. If such a propeller were placed on this engine the rpm would decrease making the power and thrust decrease until equilibrium was achieved. End of part 4

Calendar of Events 2009

August 2009

- 8 DCRC Training Session,
- 7-9 Loch Haven Cub fly In PA
- 21 DCRC Club Meeting Rockville,
- 22 DCRC Training Session
- 29 College Park Airport Air-Fair, Air show, College Park, MD

September 2009

- 4-6 Dayton Ohio Giant Scalers Airshow Wright Patterson AFB, OH
- 4-6 Clover Creek Aerodrome 1st Annual IMAC Challenge Toone TN
- 5 DCRC Training Session,
- 10-13 Route 66 Jets Springfield IL
- 11-13 Rhinebeck Jamboree, NY
- 11-13 Bealeton IMAA VA
- 12-13 DCRC Helicopter fun fly, Germantown, MD Jim Cokinos
- 17-20 The Neat Fair, Downsville NY
- 18 DCRC Club Meeting Rockville,
- 19 Black Dirt IMAC Challenge Goshen, NY
- 19-20 RDRC Fly for Tots, Raleigh, NC
- 19-20 Northern Virginia Pattern Championships, Warrenton, VA
- 19-20 Warbirds Over the Beach Virginia Beach, VA
- 19 DCRC Training Session
- 23 DCRC Board Meeting/Jim McDaniel
- 24-27 Super Jets South, Marietta GA
- 24-26 Spiderman Jets Winamac IN
- 26 Piedmont Aeromodelers 24th Annual IMAA Fun Fly Fayetteville NC

October

- 3 DCRC Oktoberfest. Walt Good

District of Columbia
Radio Control Club

First Class Mail

Andy Kane/Newsletter Editor
305 Natick Court
Silver Spring, MD 20905
E-mail: drceditor@aol.com

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Oktoberfest 2009



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