Gear Rhymes

Gear Technology's bimonthly aberration — gear trivia, humor, weirdness and oddments for the edification and amusement of our readers. Contributions are welcome.

We'd like to thank our friends down at Sanderson Brothers Pty. Ltd., Thomastown, Australia, for bringing the work of Capt. S. Bramley-Moore to our attention. So, without further ado, we offer you the following poem to help you keep your gear formulae straight.

Those who belong to the Trade Engineering,
and wish for success must understand gearing.
Wherever you go where machinery's fixed,
you are bound to find gear wheels, all sizes, all mixed.

Diameters then shall be called letter D.
It shortens the word, so I hope you agree.
Big D is measured right over the teeth,
Pitch D is measured a little beneath.

From one tooth to the next, if measured it be,
Along the Pitch Circle and not on Big D.
Will give us the Circular Pitch of the gear,
A word you will probably frequently hear.
The number of teeth in a gear wheel, you see,
Depends on the Circular Pitch and Pitch D.

If two are but known, you can find out the third
With the help of a rather peculiar word.
PI it is called, it's a valuable key,
Three point one and four one and six it must be.

If you're given the Circular Pitch and the teeth,
Put these on top and put PI underneath.
Work out this fraction and you will obtain
The answer, Pitch D. Now let me explain
That if you require any other relation,
It's easily got from this simple equation.

If Pitch D and PI are both multiplied,
To get Circular Pitch, by teeth you divide.
Reverse the last two, and the answer will be
The number of teeth in the gear wheel, you see.

The height from Pitch D to the top of the tooth
Is called the Addendum, it's really the roof.
To reckon addendum you just specify
The Circular Pitch and divide it by PI.

With this information Big D can be had,
Just twice the Addendum to Pitch D you add.
The opposite part is Dedendum, you know.
It's the height of the teeth, not on top but below.

At bottom of tooth a space is left empty,
Take Circular Pitch and divide it by twenty.
This space, known as Clearance, will plainly become
The whole depth of tooth, adding twice Addendum.

Now the Circular Pitch should not be confused
With a more simple method more frequently used.
Diametral is better than Circular Pitch,
The figures are shorter, no chance of a hitch.
Let us call it DP, it saves waste of time,
It's not only correct but it is easier to rhyme.
It gets over the use of those troublesome PIs;
Moreover its value at once signifies
The number of teeth for each inch of Pitch D.
Large DP means size of the teeth becomes wee.

The number of teeth—over DP—will at once
Give the answer Pitch D, unless you're a dunce.
The other way round, teeth over Pitch D,
Will obviously give you the answer DP.

For number of teeth, now kindly take heed,
Use Pitch D and DP, it's their product you need.
For Addendum you take one, and divide by DP.
From this you can easily work out Big D.
If it is the Clearance you're anxious to know,
Write point one five seven, with DP below.

To convert DP into circular measure
Is so easily done that it's really a pleasure.
Divide PI by DP, that is all you need do.
The thing is so simple it hardly seems true.

If you want to convert these the other way round,
The answer is quickly and easily found.
Divide PI by the Circular Pitch and you then
Get the answer DP with the stroke of a pen.

Now that's what we call literature! Any other budding gear poets out there are encouraged to send in their work. Send it by fax to Charles Cooper, senior editor, *Gear Technology* magazine, at (847) 437-6618 or by e-mail to *Charles@geartechnology.com*.