Simplified
The Common Cents System

Here for the first time is the Common Cents System in simple, basic form. Just the nuts and bolts necessary to enable anyone to comparatively measure and compare, by objective and relative means, rod action, power and speed.

by Dr. William Hanneman

Every day most of us make use of some type of system of relative measurement. Such systems are the basis for your ruler, your thermometer and your bathroom scale. The numbers these items provide do not indicate long nor short, hot nor cold, light nor heavy. But due to the relative nature of the numbers involved, it is possible to use those numbers to determine if something is lighter or heavier, hotter or colder, or lighter or heavier than something else. You may have no idea who invented these systems or what constants they're based upon, but you still use them successfully every day.

In 2002, Dr. William Hanneman invented the Common Cents System. It is a similar system of relative measurement and is intended to be used for objectively measuring the power, action and speed of any fishing rod or blank. The constants and standards which Dr. Hanneman has employed are correct by definition and the results the system provides have been proven to be relative in nature.

Although originally written to be of use to fly fishermen, the Common Cents System is applicable to any rod or blank regardless of type or style because the numbers remain relative across the entire spectrum of fly, casting or spinning models. If you wish to objectively measure power, action and/or speed in order to make relative comparisons between different rods and blanks, the information in the following brief article will allow you to do just that. Editor

There are literally thousands and thousands of different rods. Nevertheless, you can pick up any two, wiggle them, and instantly proclaim Rod A suits your taste better than Rod B. Fine, but how can you accurately describe that rod so anyone else can gain an idea of what you like? For that, you need a vocabulary which allows you to compare in relative terms the strength, and feel of those rods. The Common Cents System (CCS) provides that vocabulary.

Its most important terms are those describing, Power (ERN), Action (AA), and Feel (CCF). Additionally the CCS considers the likes of Line Number (ELN), Weight of Line (WL), Tip Power (TP), and Power Reservoir (PR). However, those are relatively minor issues and are not discussed here. But, first an example of how it all works.

Take a trout rod, any rod—How about your favorite graphite rod? On it you will undoubtedly find a marking something like "5-weight", or "For No. 5 Line."

What does that mean? Not much! Why? Because any rod can cast any line for some distance, and whoever arbitrarily put that number on did not actually specify the distance he had in mind.

Nevertheless, common sense tells us there must be some definite correlation among the strength or power of a rod, the distance one wishes to cast, and the fly line one uses. With the CCS, one can precisely define these relationships using only a "bag of pennies" and a protractor.

Helpful Definitions

Power - Power or stiffness. Measured in the CCS by ERN (Effective Rod Number).

Action - Where a rod or blank initially flexes. Measured in the CCS by AA (Action Angle).

Speed - The rate of response and recovery. Measured as "Feel" in the CCS by CCF (Common Cents Frequency).

DBI (Defined Bending Index)

This term summarizes the properties of your rod in one simple expression and is written in the form of DBI=ERN:AA

Now, speaking in the language of the CCS, your "5-weight" rod most likely has an ERN value somewhere between 4.0 and 6.9. That implies some 29 different "flavors" we can identify. It also most likely has an AA somewhere between 55 and 70 degrees. This offers another 15 different "flavors". Altogether this produces over 400 different combinations!

Which one describes your rod? Simply make the measurements and you will know. Complete instructions for making the necessary measurements are presented at the end of this article.

Interpreting the DBI

For the sake of this example, let us assume it takes 42 one cent pieces to deflect the tip of your 9 foot rod a distance of 36 inches. Using the Rosetta Stone Chart on page 31, we determine the ERN of your rod is 5.2.

When your rod has been so deflected, we find the Action Angle measures 62 degrees. This indicates that it possesses a faster action than rods with lower AA figures and a slower action than rods with higher AA figures.

The resulting DBI for your rod is now written as DBI = 5.2:62. From the preceding, it is readily apparent one can characterize and directly compare both the rod power and rod action of all fly rods.

Rod and Line Considerations

Based on the premise the power of a rod should match the weight of the line being cast, the expression ERN=ELN was developed and has subsequently led to some confusion.

The CCS does not specify that anything is either good, bad or indifferent. It merely develops objective data for the angler to use in any manner he sees fit.

The expression ERN=ELN means, if one wishes to "balance" the power of one's rod to the weight of 30 feet of fly line, this is the proper relationship. It does not mean one should or must adhere to it—especially if that doesn't "feel" as good as some other combination. By all means, use what feels best to you. Nevertheless, that is the relationship for a "CCS Balanced Outfit."

Feel is a subjective property and is a function of the desired frequency of one's casting stroke and the weight of the line being cast. For that reason, one often uses heavier lines for casting short distances and lighter lines for casting long distances—this in lieu of drastically altering one's casting stroke.

CCF (Common Cents Frequency)

This approach recognizes the feel or frequency of one's "fly rod outfit" is a function of the combination of both the rod and the line. CCF measures this combination.

Qualitatively, one senses the intrinsic feel of one's fly rod outfit, and quantitatively, one can measure frequency. The relationship developed by the CCS is shown below.

Correlation of Intrinsic Feels with Values of CCF

Intrinsic Feel	CCF, CPM
Broomstick	200
Cannon	>100
Graphite (typical)	66-90
Fiberglass	60-85
Bamboo	30-75
Greenheart	<30
Wet Noodle	0

The typical CCF of modern graphite rods is about 83 cpm, In the preceding example, the CCF of your fly rod would probably be about 80 cpm. You can, of course, change that and subsequently change its feel.

The "magic number" is about "4 cpm/line number. This means if you choose to fit your rod with a typical No. 4 line, your frequency would be about 84 cpm and your outfit would feel "typical". On the other hand, use of a typical No. 5 line would reduce the frequency to about 76 cpm. and the rod

will begin to take on the feel of bamboo. The choice is yours, but first you have to have the numbers, and the CCS can provide them.

Again, try it, you'll like it.

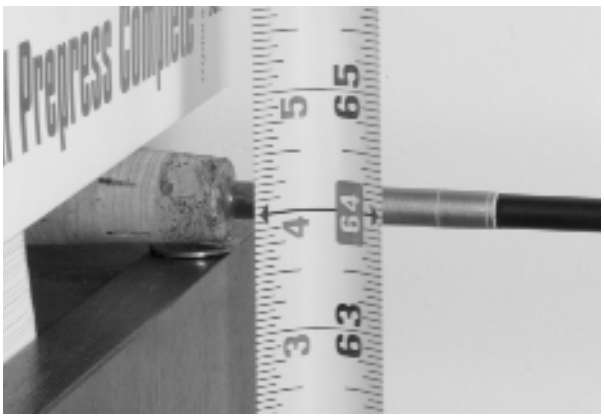
Casting and Spinning Rods

All rod blanks possess the same inherent properties. The CCS will effectively measure by relative means, the power, action and speed of any rod or blank. Because the ERN, AA and CCF numbers remain relative across the entire spectrum of rod types, it is possible to employ the CCS with casting and spinning rods and to make relative comparisions among different classifications of rods as well as among rods made from different materials.

Determination of ERN (Effective Rod Number)

1. Firmly secure the rod handle on an elevated shelf about five feet above the floor. The line guides should face upwards, and the first foot of the rod must be horizontal. Shim as needed to ensure the first foot of the rod is level.

2. Measure the height of the horizontal rod butt (e.g., 64 inches). Ignore any tip droop.



3. Straighten out a paper clip and use it to hang a small very lightweight plastic bag from the tiptop.

4. Divide the length of the rod by 3 to determine the distance the tip must be deflected, (e.g., an eight and one half foot rod must be deflected 34 inches).

5. Add shining one cent pieces minted after the year 2000 to the bag until the rod tip is properly deflected. In this case, 64-34=30 and the tip will be 30 inches above the floor.

6. Count the number of cents in the bag and convert this number to the ERN using the Rosetta Stone Chart provided on page 31.

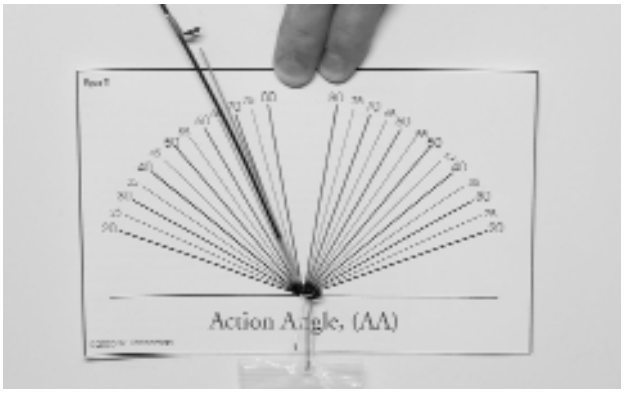
Determination of AA (Action Angle)

**The AA can be taken at the same time that the ERN is measured, if you wish.*

1. Firmly secure the rod as for measuring ERN.

2. Using transparent mending tape, attach a lightweight pointer (e.g. piece of uncooked spaghetti or stiff wire) to the tip top. Make certain the pointer lies parallel to the rod.

3. Make a copy of the Action Analyzer (Page 5) and place it behind the rod tip so that the base line is horizontal and the end of the pointer attached to the tip top passes through the origin of the protractor scale.



4. Making sure the AA chart base line is level, read the scale value indicated by the free end of the pointer and record that value as AA.

Determination of CCF (Common Cents Frequency)

1 Firmly fix rod in a horizontal position as for measuring ERN. Any looseness of support will result in an erroneous low CCF.

2. Determine weight of X from the following chart and attach that weight* to the rod tip top.

ERN - X gr	ERN - X gr	ERN - X gr
4.0 - 120	6.5 - 170	11.0 - 330
4.5 - 130	7.0 - 185	12.0 - 380
5.0 - 140	8.0 - 210	13 - 450
5.5 - 150	9.0 - 240	14 - 500
6.0 - 160	10.0 - 280	15 - 550

3. Depress and quickly release the rod tip to start it oscillating up and down, and using a stopwatch determine the number of seconds required for the tip to make 20 complete oscillations.

4. CCF = 1200/(number of seconds for 20 oscillations).

** Note: Weights can be easily constructed by using steel BBs which weigh about 8.5 grains each.*

Common Cents Quick Tips Guide

When I set up the rod or blank to take the measurements, how far foward should I support the rod or blank?

In order to provide relative results for your own work and to help ensure that your measurements will be relative to those of others, it is recommended that your forward support be no further along the blank than about 10% of its total length. For a 9 foot fly rod this would equate to a point about 11 or so inches from the butt. On a 7 foot bass rod it would equate to about 8-1/2 inches.

I have set up my rod/blank for measurement and shimmed the forward area of support so that the first foot or so of the rod is level. But the tip droops. Should I adjust for the droop of the tip?

No. The weight of the rod or blank itself will result in some tip droop. This is weight the blank will be carrying and thus is part of the overall ERN result. Therefore, the deflection distance is measured from the height of the butt, not from the height of the drooped tip.

For instance, if you have a 9 foot rod you will need to deflect the tip until it reaches a point that is 36 inches below the butt height. If the tip is drooping 2 inches at the start, it will only require another 34 inches to achieve the required deflection.

The CCF (Feel) chart does not go high enough to accommodate my rod. Is there a chart that will accommodate it?

The speed or "feel" of a rod is a concern limited mostly to lighter rods. For heavier rods such as surf, boat, trolling, etc., the feel component is not generally required. For this reason The Common Cents CCF chart does not currently accommodate rods in the upper power ranges. It may be expanded at a later date.

Universal Rod Rating System

In response to the many rod builders who requested relative measurments for additional rod properties, Dr. Hanneman introduced the Universal Rod Rating System (URRS) in 2007.

The URRS is not a replacement for the Common Cents System. Rather it is an additional component of that original system and will provide additional objective and relative measurements including Tip Power (TP), Reserve Power (RP) and a means for calculating the effective lure weight casting ranges for most rod blanks.

Many rod builders have found the URRS useful for their respective purposes. If one wishes to obtain these additional measurements, they are available via the URRS.

If you would like to learn more about the Universal Rod Rating System, you can find the original article in the Volume 10 #4 issue of RodMaker Magazine.

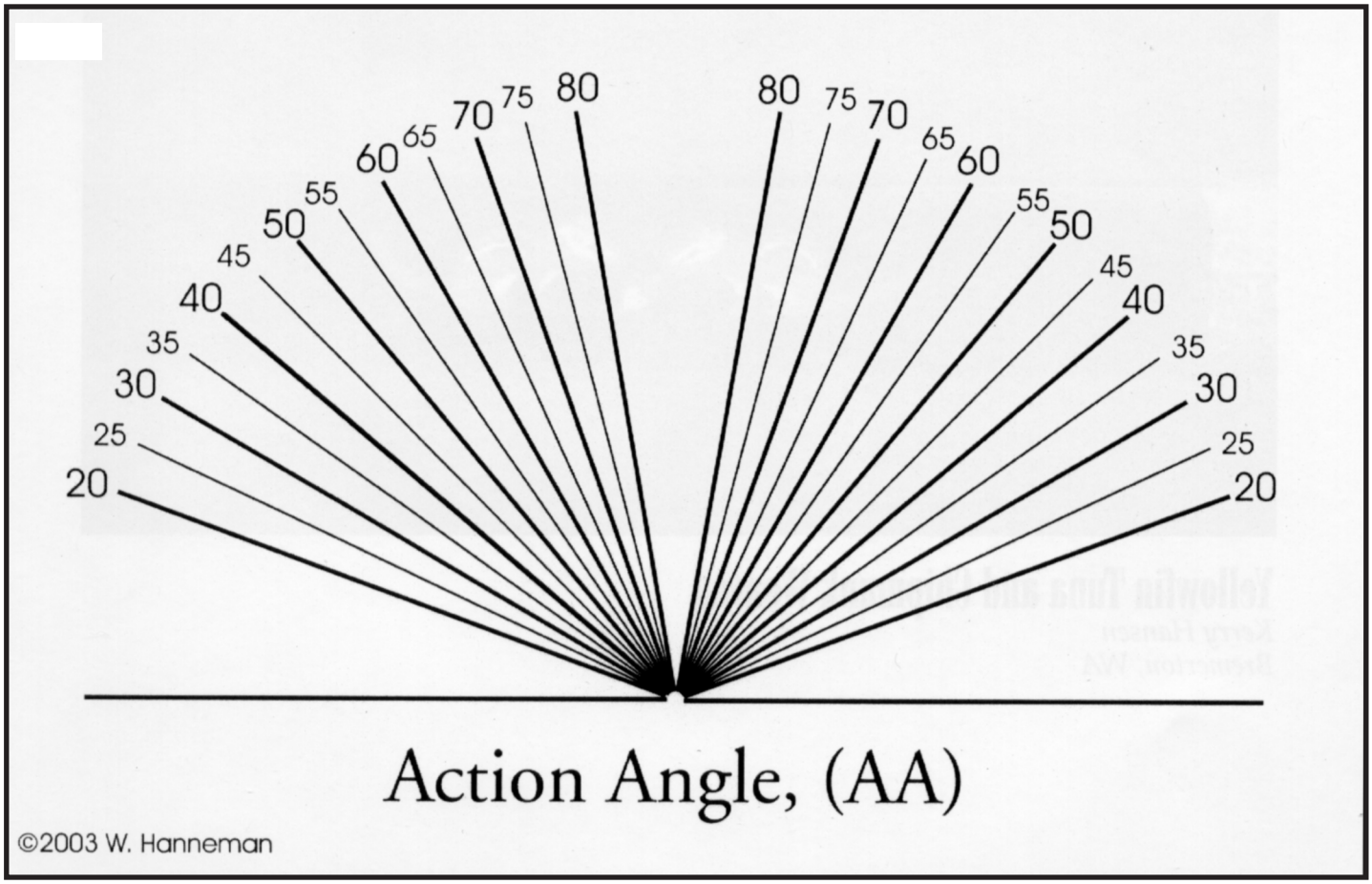
Additional Works by Dr. William Hanneman

Common Cents Part 1 V6 #2
Common Cents Part 2 - The Big Picture V6#3
Common Cents Part 3 - The Rosetta Stone V6#4
Fly Rod Expertise by the Numbers V6 #5
Fly Rod & Reel Balancing V6 #6
Common Cents Frequency V8 #1
The Universal Rod Rating System V10 #4
Rod Range and CCF V10 #6
"Centsitivity" V11 #1

The above works are availble in the back issues of RodMaker Magazine as noted to the right of each article title.

Selected articles dealing with the Common Cents System may also be found online at:

www.common-cents.info



The Common Cents Rosetta Stone Chart

AFTMA Lines

Line No.	Weight grains	Dividing Weight, grains	ELN
		30	0.0
0	40		0.5
		50	1.0
1	60		1.5
		70	2.0
2	80		2.5
		90	3.0
3	100		3.5
		110	4.0
4	120		4.5
		130	5.0
5	140		5.5
		150	6.0
6	160		6.5
		172.5	7.0
7	185		7.5
		197.5	8.0
8	210		8.5
		225	9.0
9	240		9.5
		260	10.0
10	280		10.5
		305	11.0
11	330		11.5
		350	12.0
12	380		12.5
		415	13.0
13	450		13.5
		475	14.0
14	500		14.5
		525	15.0
15	550		15.5
		575	16.0

DBI Rods

Intrinsic Power, grains	Dividing Weight,	ERN	Cents
	130	0.0	3.4
340		.05	8.8
	550	1.0	14.2
670		1.5	17.4
	790	2.0	20.5
920		2.5	23.8
	1050	3.0	27.2
1180		3.5	30.6
	1310	4.0	33.9
1440		4.5	37.3
	1570	5.0	40.7
1685		5.5	43.6
	1830	6.0	47.4
1973		6.5	51.1
	2115	7.0	54.8
2270		7.5	58.8
	2425	8.0	62.8
2580		8.5	66.8
	2760	9.0	71.5
2940		9.5	76.1
	3170	10.0	82.1
3400		10.5	88.1
	3680	11.0	95.3
3960		11.5	102.6
	4240	12.0	109.8
4520		12.5	117.1
	4900	13.0	126.9
5280		13.5	136.8
	5560	14.0	144.0
5840		14.5	151.3
	6120	15.0	158.5
6400		15.5	165.8
	6680	16.0	173.0

Cents/ERN

10/0.61	65/8.28	120/12.65
11/0.70	66/8.40	121/12.70
12/0.79	67/8.52	122/12.75
13/0.89	68/8.63	123/12.80
14/0.98	69/8.73	124/12.85
15/1.12	70/8.84	125/12.90
16/1.28	71/8.95	126/12.95
17/1.44	72/9.05	127/13.01
18/1.60	73/9.16	128/13.06
19/1.77	74/9.27	129/13.11
20/1.92	75/9.38	130/13.16
21/2.08	76/9.49	131/13.21
22/2.23	77/9.58	132/13.26
23/2.38	78/9.66	133/13.31
24/2.53	79/9.74	134/13.36
25/2.67	80/9.83	135/13.41
26/2.82	81/9.91	136/13.46
27/2.97	82/9.99	137/13.51
28/3.12	83/10.08	138/13.58
29/3.27	84/10.16	139/13.65
30/3.42	85/10.24	140/13.72
31/3.57	86/10.33	141/13.79
32/3.72	87/10.41	142/13.86
33/3.86	88/10.49	143/13.93
34/4.01	89/10.56	144/14.00
35/4.16	90/10.63	145/14.07
36/4.31	91/10.70	146/14.14
37/4.46	92/10.77	147/14.21
38/4.60	93/10.84	148/14.27
39/4.75	94/10.91	149/14.34
40/4.90	95/10.98	150/14.41
41/5.05	96/11.05	151/14.48
42/5.20	97/11.12	152/14.55
43/5.35	98/11.18	153/14.62
44/5.50	99/11.25	154/14.69
45/5.65	100/11.32	155/14.76
46/5.79	101/11.39	156/14.83
47/5.94	102/11.46	157/14.90
48/6.08	103/11.53	158/14.97
49/6.22	104/11.60	159/15.03
50/6.35	105/11.67	160/15.10
51/6.49	106/11.74	161/15.17
52/6.62	107/11.81	162/15.24
53/6.76	108/11.88	163/15.31
54/6.89	109/11.94	164/15.38
55/7.03	110/12.01	165/15.45
56/7.15	111/12.08	166/15.51
57/7.28	112/12.15	167/15.58
58/7.40	113/12.22	168/15.65
59/7.53	114/12.29	169/15.72
60/7.65	115/12.36	170/15.79
61/7.78	116/12.42	171/15.86
62/7.90	117/12.49	172/15.93
63/8.03	118/12.55	173/16.00
64/8.15	119/12.60	