What is a model tank's Scale Speed?

If you were a real serious tanker, you might want to make your tank to run at "Scale Speed". But what is "Scale speed"? How you define "Scale Speed"?

What is "Scale Speed"?

To run the model tank's speed, scaled from the actual real tank's speed.

How to define "Scale Speed"?

Most of the information on the websites will define as: direct proportional from the tanks' scale. Meaning, using a 1/16 scale tank, if it was running at a model speed (max) 1km/h, then it 'should be' running from a scale speed of 16km/h.
Which is not a very accurate presentation.

Here is why:

1. a 1/12 RC gas powered car running at model speed of 50km/h, does not mean it is running from a scale speed of 600km/h
2. Not every "time, space and quantity" can be directly scaled down for measurements.
3. For example: if a real tank had a reload time of 3secs, which does not mean a 1/16 model tank will need to have 0.1875secs of reloading time.

So, how do you define a tank's "Speed Scale"?

By IMPACT's definition, it is too difficult and complicated, for reasons:

1. TU and/or any kind of gearboxes have fixed gear ratio and no clutches.
2. Different motors will generate different running speeds.
3. Different batteries (NiHM, LiPO) will generate different running speeds.
4. Different sprocket wheels' diameters will generate different running speeds.
5. Many more conditions and variables will contribute to conclude a running model speed.

One of the more logical ways to define the "Scale Speed" is not by scaling to or from the actual real tank speed, but to reference to **one** designated highest tank's speed and defines the remaining lower tanks' speeds proportionally.

Below is an example.
Set conditions:

1. a. List out the available tanks with their real tanks' speeds, as shown below.

German Tank	Speed km/h	Gear Ratio	US Tank	Speed km/h	Gear Ratio	Russian Tank	Speed km/h	Gear Ratio
Pz III	40.0	???	M4	38.5	???	T34	55.0	59.77
Pz IV	40.0	???	M26	40.0	???			
Tiger I	38.0	???						
Panther	46.0	???						
King Tiger	35.0	???						

Table 1. List of Various Tanks' Real Speeds

b. Tamiya's stock gearbox's gear ratio is 59.77:1, IMPACT's stock TU gear ratio is 105.47:1
c. Using Mabuchi's 380SH motors, powered by 7.4V NiHM Battery
d. Taking sprocket wheel's diameter to be 49mm.
e. Using IMPACT's TU and IMPACT metal tracks
f. All other variables at constant.

2. Define a model that is available in the market that has the fastest ***real tank speed.*** In this case, IMPACT will use T34's 55km/h (as boxed in yellow), as the reference point.

3. Defined IMPACT's TU (without DDG) and Tamiya's stock gearboxes by 59.77:1 to be highest RPM for all tanks (keeping all other variables as constants) to be T34's gear ratio configuration.

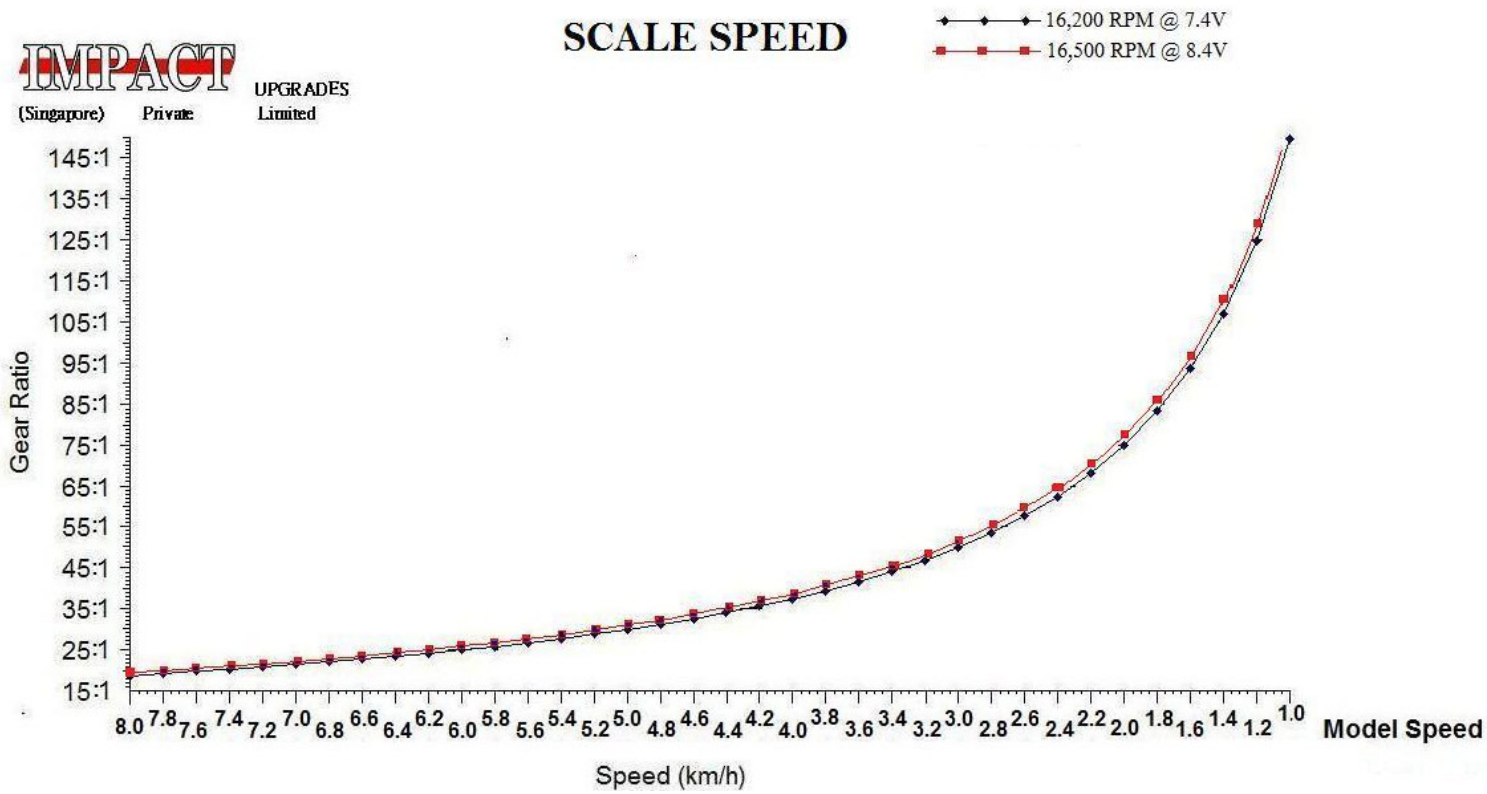
4. Then, calculate the proportional speed difference referencing from T34 real tank speed to derive other proportional gear ratios of the designated model tanks' speeds.

5. For example, taking M26:
a. the real tanks' speeds difference between T34 is (55-40)/55 = 27.27%
b. for gear ratio of 59.77:1, the calculated model speed is 2.55km/h
c. at 27.27% real tanks' speed difference, the proportional model speed is
[2.55 x (1-0.2727)] = 1.855km/h
d. The calculated gear ratio configuration will be **82.19:1**
Graph 1 can also help to plot out the Gear Ratio ←→ Model Speed.

6. By using the above as the basis of calculation and/or graph plotting, the proportional gear ratio configurations can be derived and tabulated, as shown in Table 2

German Tank	Speed km/h	Gear Ratio	US Tank	Speed km/h	Gear Ratio	Russian Tank	Speed km/h	Gear Ratio
Pz III	40.0	82.19	M4	38.5	85.41	T34	55.0	59.77
Pz IV	40.0	82.19	M26	40.0	82.19			
Tiger I	38.0	86.54						
Panther	46.0	71.48						
King Tiger	35.0	94.94						

Table 2. List of Various Tanks' Gear Ratios and Real Tanks' Speeds



Graph 1. Relationship between Gear Ratio and Model Speed

Conclusion

IMPACT's suggested definition of "Tanks' Scale Speed" is only for reference.
It gives Tankers another alternative school of thought to this subject and a reference, when tanks' speeds are vital, as a personal modeling goal or a group IR tanks battling game rule.

But by making the model tanks configured dead accurate to achieve the Scale Speed within a tank group/club might create frustrations and complications.
This may greatly reduce the fun that was originally intended.

The most importantly, fun cannot be lost in a hobby!