

## Roll20 Mod Script: DM Dashboard

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### Introduction

*What is DM Dashboard (for D&D 5e by Roll20)*

The DM Dashboard Mod leverages Roll20's handout feature to present a new type of game-time user interface. It was specifically designed for DMs/GMs by assisting them during combats with easy access to key functionality and information.


### Getting Started

Once it's installed and saved in your campaign's Mod/API area it is ready to go. The only command you need to know is:

```
!tor
```

This command will force the DM Dashboard to:

#### 1. Creates three DM Dashboard Handouts:

- DM Turnorder List** – A turnorder list on steroids, this handout refreshes every time the turnorder changes, including edits to the turnorder. I recommend popping  this handout out, resizing it and then placing it on another screen.
- DM Character Sheet** – A character sheet summary for player characters and NPCs. Just like the *DM Turnorder List*, this handout refreshes every time the turnorder changes or is edited. The DM can actually initiate actions, roll checks and cast spells from this sheet.
- DM Turnorder Log** – A csv log table with information on each player and NPCs turn. I hope to build some analysis tools at some point to provide additional insight on how your games run at different levels and complexity of characters.

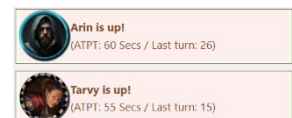
#### 2. Whispers a DM Dashboard Dialog with links to open these 3 handouts.

**Note:** You don't even need to type the `!tor` command as the DM Dashboard will begin working the first time you change or open the turnorder, creating and refreshing the handouts as it responds to Turnorder change events.

### Features

Before getting into the details of each handout, here are some of the features that are integrated into the DM Dashboard Mod.

- Turn Tracker Stats Tracking** – Every time you click next, whether from the turnorder dialog or from one of the DM Dashboard handouts, this mod tracks the begin time, end time and duration of each players and DMs turn. It stores this information in the following attributes in the players character sheet:
  - to\_secs:** Total number of seconds spent on a turn (over last 50 turns)
  - to\_count:** Number of turns so far recorded, and maxes out at 50. After 50 turns, the script drops an average value to\_secs, and adds the latest turns duration in seconds. The logic gives you a running 50 turn average.
  - to\_avg:** Average seconds per turn (to\_secs/to\_count).
  - to\_lastturn:** Seconds spent on previous turn.
- Player up Next dialog** – Using the data captured as part of the turn tracker above, the following dialog appears for your players when it is their turn. As you can see it presents their Average Time Per Turn (ATPT) in seconds and how much time they spent on their previous turn.



Handouts

DM Turnorder List

Refresh! Next Prev Sort Sort-Wrap Clear | Round Counter Custom | D20-w Adv-w Dis-w D4-w D6-w D8-w D10-w D12-w | GMNote Reset-Stats

[+] Expand Current Character Details

Turn Order

(Last Turn: 0)

Turn	Name	Functions	HP	Markers	AC	PP	Speed	Senses/Saves	Tooltip
11.11	Baaz Draconian		<div>22 / 22 (100%)</div>		14	9	30 ft.	darkvision 60 ft., passive Perception 9 Str Dex Con Wis Int Cha	
8.11	Baaz Draconian		<div>5 / 22 (23%)</div>		14	9	30 ft.	darkvision 60 ft., passive Perception 9 Str Dex Con Wis Int Cha	He is having a bad day.
5.11	Baaz Draconian		<div>10 / 22 (45%)</div>		14	9	30 ft.	darkvision 60 ft., passive Perception 9 Str Dex Con Wis Int Cha	Clover has placed a Hunter's Mark on Baaz Draconian.
5.10	Bozak Draconian		<div>40 / 40 (100%)</div>		15	10	30 ft.	darkvision 60 ft., passive Perception 10 Str Dex Con Wis Int Cha	
4.14	Arin		<div>19 / 27 (70%)</div>		15	13	30	darkvision 10 ft. Str Dex Con Wis Int Cha	
2.12	Noble		<div>9 / 9 (100%)</div>		15	12	30 ft.	passive Perception 12 Str Dex Con Wis Int Cha	
20.17	Clover		<div>36 / 36 (100%)</div>		16	17	35	darkvision 60 ft. Str Dex Con Wis Int Cha	Clover has placed a Hunter's Mark on Baaz Draconian.
18	Ankheg		<div>39 / 39 (100%)</div>		14	11	30 ft., burrow 10 ft.	darkvision 60 ft., tremorsense 60 ft., passive Perception 11 Str Dex Con Wis Int Cha	

Refresh! Next Prev Sort Sort-Wrap Clear | Round Counter Custom | D20-w Adv-w Dis-w D4-w D6-w D8-w D10-w D12-w | GMNote Reset-Stats

NPCs [+]

Baaz Draconian [+] Draft Horse [+] Veteran [+] Wraith [+]

Player Characters [+]

Narovaan Belanor [+] Rayan Greatstone [+] Tarvy [+] Thorin [+]



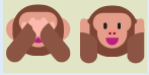




Turnorder Character Sheet Turnorder Log




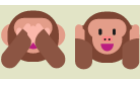

Purpose

Displays a version of the turnorder with additional functionality to make running combats easier and more efficient. This handout is refreshed every time the turn order changes.

User Interface Functionality

Visual Element	Function	Description
Menu/Header Section		
Refresh!	Refresh handouts	Refreshes all DM Dashboard handouts should it become stale. For example, if you
Next	Advance turnorder	Advance the turnorder one turn.
Prev	Backup turnoder	Backups the turnorder one turn
Sort	Sort turnorder	Sorts the turnorder in descending order, placing the highest turn value at the top position.
Sort-Wrap	Sort turnorder, anchoring current top item	Sorts the turnorder in descending order, leaving the current turnorder item at the top. Once it gets to the lowest value in the list, continues with the highest value. Handy if you are adding tokens during the middle of play, but don't want to completely reset you list.
Clear	Clear turnorder	Removes all entries from your turnorder
Round	Add round counter to turnorder	Adds a round counter ">>>Round<<<" with a starting position of 1. This will auto increment as play proceeds.
Counter	Adds a custom count-down/up item to the turnorder	Adds a count-down/up counter to the turn order. A couple roll20 dialogs will ask for direction, starting value and name. Handy for tracking spell durations.
Custom	Adds a basic custom item to the turnorder	Adds a custom item to the turnorder, asking for a name and positon.

<u>D20-w</u>	Rolls a D20 in chat	Clicking D20 will make a <b>public</b> D20 roll in chat. Clicking the “w” will whisper (/gmroll) it to chat.
<u>Adv-w</u>	Roll with Advantage	Will roll 2 D20s, keeping the high value.
<u>Dis-w</u>	Roll with Disadvantage	Will roll 2 D20s, keeping the low value.
<u>D4-w, D6-w, D8-w, D10-w, D12-w</u>	Dice Rollers	Will roll dice to the chat window. Clicking the “w” will whisper the associated die to the chat.
<u>GMnote</u>	Add not to GM section of this handout	<p>Will add a quick note to the top of the GM Notes section of the DM Turnorder List. Previous notes are preserved, with the most recent notes appearing at the top.</p> <p><i>Note: The GM Note section doesn't always refresh in realtime, so you may not see the notes unless you close and re-open the handout.</i></p>
<u>Reset-Stats</u>	Reset turnorder statistics for all characters and the DM/GM	Resets all the turnorder tracking attributes in character sheets (e.g., to_secs, to_count, to_avg) and state memory used to track the DM/GM turn stats.
<u>[+] Expand Current Character Details</u>	Expands this handout displaying the current character sheet	Expands the handout showing the character or NPC details at the top of this report. I'll go into all the features of the expanded character detail section in the <b>DM Character Sheet</b> section below.
<b>Turnorder Table Section</b>		
<b>Col: Turn</b>	Turnorder value	Equivalent to the turn value in the Turnorder dialog
<b>Col: Name</b>	Turnorder item and token image	<p>Equivalent to the turnorder item.</p> <p>Note: Clicking on the Token Icon, will ping the token on the map, moving the map so it is in the center of play.</p> <p><b>Bolded</b> names indicate the token is visible, whereas <b><i>Italicized</i></b> names indicate the token is invisible (on gmlayer).</p>
<b>Col: Functions</b>	A list of buttons that initiate functions on associated token	<p>Remove item from the turnorder</p> <p> Toggles token between the gmlayer and the object layer, effectively making it visible/invisible to the players</p>
	Remove item	Remove item from the turnorder
	Toggle token visibility	<p>Toggles the token between the 'gmlayer' and 'objects' layers, effectively making the token invisible/visible to players.</p> <p><b><u>Visible</u></b> tokens show the right icon, and their names are italicized.</p> <p><b><u>Invisible</u></b> tokens show the left icon, and their names are bolded.</p>
	Open Character Sheet	Opens the Roll20 Character sheet for the associated item
	Add quick note	<p><b>For player characters</b> - Adds a quick note to the GMNotes field of a character sheet.</p> <p><b>For NPCs</b> – Adds a quick note to the GMNotes field on the associated token.</p>
 	Lock/Unlock Tokens ability to be moved	Toggles the ability to move that token on the map.

<b>Col: HP</b>	Token health	<p>Displays the HP, Max HP and percentage health for the associated token. The color of the cell is a quick indicator as to health:</p> <ul style="list-style-type: none"> <li>Green – 75%+ health</li> <li>Yellow – between 50% and 75% health</li> <li>Orange – between 25% and 50% health</li> <li>Dark Orange – Less than 25% (but not dead)</li> <li>Red – 0% health</li> </ul> <p>Clicking the band aid icon allows you to adjust HP</p>
	Adjust token HP	<p>Pops up a dialog allowing you to adjust the HP for the associated token where entering a plus (+) or minus (-) sign in front of a number will adjust the current HP by that amount. Entering a number with no signage will set HP to that value.</p>
<b>COL: Markers</b>	Displays associated token status markers	<p>In the Future, I plan to expand this area allowing you to add/remove status markers and showing a tooltip when you hover over a status marker giving you its name and possibly a description of the condition.</p>
<b>Col: AC</b>	Token armor class	AC for the associated character/NPC
<b>COL: PP</b>	Passive Perception	Passive Perception for the associated character/NPC
<b>Col: Speed</b>	Speed	Speed for the associated character/NPC
<b>Senses</b>	Darkvision and Senses information	<p><b>For Characters</b>, current dynamic lighting settings associated with their token.</p> <p><b>For NPCs</b>, Senses field from their character sheet.</p> <p><i>Future: I plan to add a feature to assign a preconfigured lighting setup for player characters. This would enable you to turn on/off torches, lanterns, driftglobes, and apply darkness to the associated character token.</i></p>
<b>Saves</b> <b>Str Dex Con</b> <b>Wis Int Cha</b>	Saving Throws	<p>Found in the same column as Senses (for space reasons), clicking on one of the attributes abbreviations initiates an saving throw for the associated Character/NPC.</p>
<b>Col: Tooltip</b>	Token Tooltip	<p>This column allows you to View, Edit, Clear and toggle tooltips for the associated tokens.</p> <ul style="list-style-type: none"> <li><b>Bolded</b> tooltips are visible.</li> <li><b>Italicized</b> tooltips are not visible.</li> </ul>
	Change tooltip text	Change tooltip text for the associated token
	Clear tooltip text	Clears tooltip text for the associated token
	Toggle tooltip visibility	<p>Toggles tooltip visibility for the associated token.</p> <ul style="list-style-type: none"> <li><b>Bolded</b> tooltips are visible.</li> <li><b>Italicized</b> tooltips are not visible.</li> </ul>
<b>Tokens Not on Turnorder Section</b> – Lists tokens on the current player page, but not in the turnorder		
<b><u>NPCs</u> [+]</b>	Add <b>all</b> NPCs to turnorder.	Clicking this text/button will roll initiative for all NPCs not currently on the turnorder.
 Wraith [+]	Add single NPC to turnorder	<p><b>Token image</b> – pings the token on the map</p> <p><b>[+]</b> – Rolls initiative for the associated token (to the left)</p>
<b>Player Characters</b> [+]	Add all or individual players to the turn order.	Same functionality as NPCs above.

<b>Individual Character Tokens</b>		
<b>Turnorder Character Sheet</b>	Opens the DM Turnorder Character Sheet handout	Opens the DM Turnorder Character Sheet handout
<b>Turnorder Log</b>	Opens the DM Turnorder Log handout	Opens the DM Turnorder Log handout

## DM Character Sheet



The screenshot shows a DM Character Sheet for a character named 'Clover'. At the top, it displays 'Avg Turn: 60 / Secs: 600 / Cnt: 10'. The character is identified as 'Chaotic Good Gloom Stalker Ranger 4 (Wood Elf)'. The sheet is organized into several columns: Attributes (Str, Dex, Con, Wis, Int, Cha), Skills (AC, HP, Speed, PP, Init, Caster, Spell DC, Spell Attack Bonus, Prof Bonus, Tools, Lang/Other), Stats (acrobatics, animal\_handling, arcana, athletics, deception, history, insight, intimidation, investigation), medicine, nature, perception, performance, persuasion, religion, sleight\_of\_hand, stealth, survival, Attacks (Shortsword, Dagger, Longbow, Hunter's Mark, Cure Wounds, Zephyr Strike, Hail of Thorns, Eldritch Blast), Traits (Favored Enemy, Natural Explorer, Deft Explorer, Favored Foe, Natural Explorer: Forest, Fey Ancestry, Trance, Darkvision, Mask of the Wild, Wanderer, Tough, Fighting Style, Spellcasting, Spellcasting Focus, Fighting Style: Archery, Primeval Awareness, Primal Awareness, Dread Ambusher, Umbral Sight, Martial Versatility, Wood Elf Magic), and Spells/Resources (Level cantrip: Eldritch Blast, Level 1 (3 of 1): Hunter's Mark, Cure Wounds, Zephyr Strike, Hail of Thorns, Disguise Self, Speak with Animals, Longstrider (At Will), Level 2 (0 of 0): Pass without Trace (1 / Long rest), Resources (Favored Foe, Arrows, Good Berry, Potion of Healing)). At the bottom, there are navigation links: Refresh! Next Prev Sort Sort-Wrap Clear | Round Counter Custom | D20-w Adv-w Dis-w D4-w D6-w D8-w D10-w D12-w | GMNote Reset-Stats. On the far right, there are links for 'Turnorder List' and 'Turnorder Log'.

## Purpose

Displays a summary representation of a character sheet for the current NPC or Player Character. In addition to the information it displays, it includes features that allow you to make checks, saves, attacks and cast spells.

## User Interface Functionality

Visual Element	Function	Description
<b>Header Section</b>		
	Show Roll20 character sheet	<b>Opens the Roll20 Character sheet for this character/npc</b>
	Ping Token	Pings the token (GM Ping) associated with this character/npc.
Header Info	Basic Character/NPC information and statistics	<p>This section includes npc/character name, token image, turnorder tracking stats, and class information.</p> <p>For NPCs, the turnorder tracking stats are associated with the DM/GM.</p>
Character/NPC Table Information	Character/NPC detail Information	<p>Much of this area is self explanatory and shouldn't need descriptions. However, there is some imbedded functionality which I'll document here:</p> <ul style="list-style-type: none"> <li>Attribute* – Click to make a Check Roll</li> <li>Attribute sv* – Click to make a Saving Throw</li> </ul>

		<ul style="list-style-type: none"> <li>Skills – Click to make a skill check</li> <li>Attacks – Click to make an attack roll</li> <li>Traits – Hover to have a tooltip popup with the text associated to the trait</li> <li>Spells – Bolded spells have been <b>Prepared</b></li> <li> - <b>Cast</b> the associated spell (on the right)</li> <li> - <b>Jump to <i>D&amp;D Beyond</i> Spell Description</b></li> </ul>
Footer Menu and Links		Duplicates same functionality described in the DM Turnorder List handout.

## DM Turnorder Log

DM Turnorder Log	Show to Players	Edit	Q
<p>CHAR,03/21/2023 04:42:00,03/21/2023 04:42:04,"-NRKaLu9UQR0vAFaVE8N",12,2,"Tavy Cleverbolt",0,"4","Arcane Trickster Rogue 4","Kender",12,12,2</p> <p>NPC,03/21/2023 04:42:08,03/21/2023 04:42:10,"-NTHu6VkdYkfb3iutocG",19,11,"Baaz Draconian",0,"1/2","Medium Monstrosity, Typically Lawful Evil","",2,3,0</p> <p>NPC,03/21/2023 04:42:10,03/21/2023 04:42:12,"-NT7mv3WrC5RK_i0djzC",19,1,"Bozak Draconian",0,"2","Medium Monstrosity (Sorcerer), Typically Lawful Evil","",5,3,3</p> <p>CUSTOM,03/21/2023 04:42:12,03/21/2023 04:42:15,-1,4,&gt;&gt;&gt;Round&lt;&lt;&lt;0,0,0,0,0,0</p> <p>CHAR,03/21/2023 05:23:52,03/21/2023 05:23:56,"-NRKaLu9UQR0vAFaVE8N",12,2,"Tavy Cleverbolt",0,"4","Arcane Trickster Rogue 4","Kender",12,12,2</p> <p>NPC,03/21/2023 05:27:10,03/21/2023 05:27:24,"-NTHu6VkdYkfb3iutocG",19,11,"Baaz Draconian",0,"1/2","Medium Monstrosity, Typically Lawful Evil","",2,3,0</p> <p>NPC,03/21/2023 05:27:24,03/21/2023 05:27:26,"-NT7mv3WrC5RK_i0djzC",19,1,"Bozak Draconian",0,"2","Medium Monstrosity (Sorcerer), Typically Lawful Evil","",5,3,3</p> <p>CUSTOM,03/21/2023 05:27:26,03/21/2023 05:27:29,-1,5,&gt;&gt;&gt;Round&lt;&lt;&lt;0,0,0,0,0,0</p> <p>CHAR,03/21/2023 05:27:29,03/21/2023 05:27:31,"-NRKaLu9UQR0vAFaVE8N",12,2,"Tavy Cleverbolt",0,"4","Arcane Trickster Rogue 4","Kender",12,12,2</p> <p>NPC,03/21/2023 05:27:31,03/21/2023 05:28:03,"-NTHu6VkdYkfb3iutocG",19,11,"Baaz Draconian",0,"1/2","Medium Monstrosity, Typically Lawful Evil","",2,3,0</p> <p>NPC,03/21/2023 05:28:03,03/21/2023 05:28:10,"-NT7mv3WrC5RK_i0djzC",19,1,"Bozak Draconian",0,"2","Medium Monstrosity (Sorcerer), Typically Lawful Evil","",5,3,3</p> <p>CUSTOM,03/21/2023 05:28:11,03/21/2023 05:28:12,-1,6,&gt;&gt;&gt;Round&lt;&lt;&lt;0,0,0,0,0,0</p> <p>CHAR,03/21/2023 05:28:12,03/21/2023 05:28:15,"-NRKaLu9UQR0vAFaVE8N",12,2,"Tavy Cleverbolt",0,"4","Arcane Trickster Rogue 4","Kender",12,12,2</p> <p>NPC,03/21/2023 05:28:24,03/21/2023 10:18:24,"-NTHu6VkdYkfb3iutocG",19,11,"Baaz Draconian",0,"1/2","Medium Monstrosity, Typically Lawful Evil","",2,3,0</p> <p>NPC,03/21/2023 17:33:13,03/21/2023 17:33:17,"-NT2aEtDWhgMBxgut9wH",18,"Ankheg",0,"2","Large monstrosity, unaligned","",2,0,0</p> <p>NPC,03/21/2023 17:33:17,03/21/2023 17:33:19,"-NTHu6x8Cm9kKzJlpg",11,11,"Baaz Draconian",0,"1/2","Medium Monstrosity, Typically Lawful Evil","",2,3,0</p> <p>CUSTOM,03/21/2023 19:28:28,03/21/2023 20:18:03,-1,1,&gt;&gt;&gt;Round&lt;&lt;&lt;0,0,0,0,0,0</p> <p>NPC,03/21/2023 20:18:03,03/21/2023 20:18:22,"-NTHu6x8Cm9kKzJlpg",11,11,"Baaz Draconian",0,"1/2","Medium Monstrosity, Typically Lawful Evil","",2,3,0</p>			

### Purpose

Turnorder data table tracking statistics on each turn. I hope to use this data later to gain additional insight in my games through offline analysis in excel. I've not ruled out a future Turnorder Analysis Mod that would digest this information and present back to you and your players metrics, trends and insight on how they play.

*Note: This is still a work in progress and the columns and data being tracked are likely to change.*

*Current Columns: (Note this will very likely change as I develop it further)*

Column	Character	NPC	Custom
1	Type: CHAR	NPC	CUSTOM
2	Start Time	Same	Same
3	End Time	Same	Same
4	TokenId	TokenId	-1
5	Initiative Value (PR)	Initiative Value (PR)	Turnorder Value (PR)
6	Character Name	NPC Name (token)	Custom Name
7	Blank	Blank	Blank
8	Char Level	NPC Challenge Rating	0
9	Long Class Description	Creature type, alignment	Blank
10	Action Count*	Action Count*	0
11	Traits Count	Traits Count	0
12	Caster Level	Caster Level	0

*\*Does not include Bonus Actions, Reactions, Legendary Actions, Layer Actions, ....*

## Anticipated Future Improvements:

- **General**
  - *Improve performance.*
  - *Bug fixes (as they are found)*
  - **Dynamic Lighting** - Not exactly sure what this will be, but maybe a dedicated DM handout that displays the current page information with a table listing PC and NPC token vision stats.
  - **DM Macros Handout** – I’m envisioning a DM Macro handout builder that lets you select macros from your macro list or a macro mule character sheet and arrange them in a gridded table-based handout. You could then pop this handout out, and drag it to another screen for easy access to all your macros.
- **DM Turnorder List**
  - **Encounter Challenge Rating calculation** - based on the characters and opponents in the turnorder list. This requires that I add functionality to allow DM/GM to differentiate friend from foe as not all NPCs are enemies.
  - **HP Bar Value** - Add ability for DM/GM to select a different bar to track HP in. The current default is to use **bar value 1**.
  - **Public Pings** – Add feature to allow DM/GM to perform a public ping anywhere they can currently initiate a private ping.
  - **Status Conditions** – Add tooltip popups describing token status and condition markers.
  - **Token Auras** – Add feature to toggle through a variety of small public and private token auras
  - **Dump Bio to Chat** – Dump a copy of the NPC/Characters bio to chat with option to show players.
  - **Dump Image to Chat** – Dump first image associated with Sheet to chat with option to show players.
- **DM Character Sheet**
  - **Saving Throws** – Add saving throw feature, similar to the current Skill Check feature.
  - **Expand on Actions** – Add reactions, bonus actions, legendary actions, ....
  - **Add Spell Description Tooltip** – Add tooltip to spells to show a basic description of the spell when mouse hovers over spell name.
- **DM Turnorder Log**
  - *Log Health Information, HP and HPMax*
  - *Spell Information, Spells Slots, Sorcery Points, Available and Max*