

New Software Version 1.05

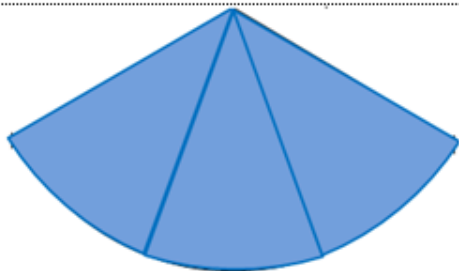
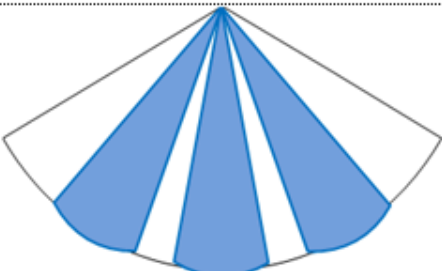
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1. Improved Default Settings

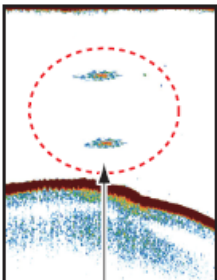
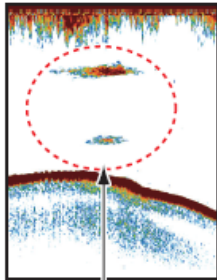
Default settings of following items are changed to offer superior performance compared to the previous default.

- ✚ The new default beam angle and beam width effectively covers a wider area at 120°.
- ✚ Longer tail echoes of seabed will be shown compared with the previous version.
- ✚ Default clutter suppression is increased from [0] to [25] in order to show individual fish and groups of fish clearly by suppressing noise and weak targets while using manual gain. Note; In order to show weak echoes, lower the clutter suppression value.

Item	New – V1.05	Previous – V1.04 or earlier
Beam Angle	40°	30°
Beam Width	40°	20°
		
Clutter Suppression	25	0

2. Improved TVG

Targets in deeper water will show as smaller size echoes and/or in weaker color compared to targets of the same size located in shallow water. This is because echoes from deeper targets take longer to return when compared to shallower water targets. **TVG** (Time Variable Gain) is utilized to adjust the gain and show echoes of same-size targets at different depths in the same size and color. The following illustrations show an example of TVG.

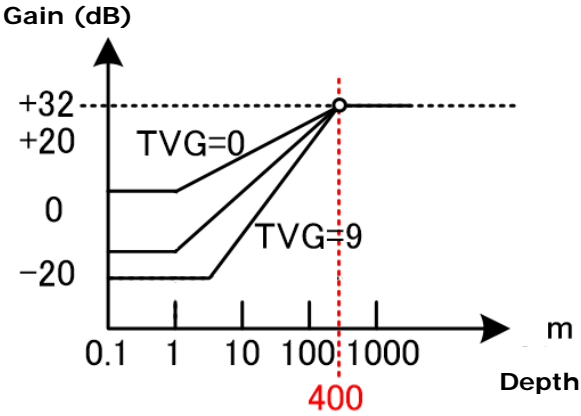
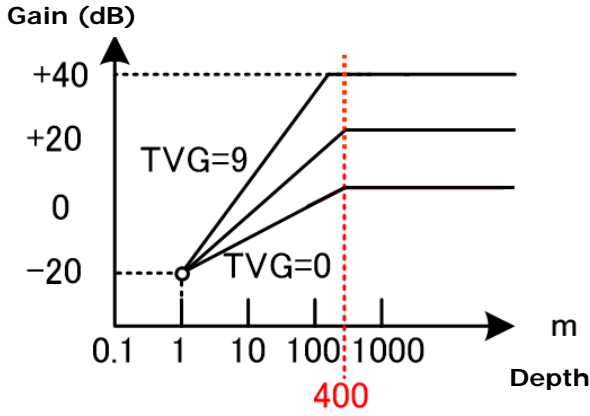
With TVG		No TVG	
The targets in the same size are shown in identical size and/or color.		The targets in the same size are shown in different size and/or color.	

The DFF-3D **v1.05** improves how the TVG effectively works. This section describes how the gain varies according to depths in each presentation mode.

2.1. TVG in Multi-Sounder Mode

New TVG Graph

The Multi-Sounder Mode has **TVG** settings of ([0] to [9]) and **TVG Distance**. In the following example, the TVG Distance is set to [400 m] to compare the new v1.05 with the previous versions.

New – V1.05 (TVG Distance: 400 m)	V1.04 or earlier (TVG Distance: 400 m)
	
<p>With larger TVG values, the gain at shallow water decreases.</p>	<p>With larger TVG values, the gain at shallow water increases.</p>
<p>The base depth is the depth set in TVG Distance: The gain decreases while the depth is shallower following the TVG graph patterns above.</p> <p>When the depth reaches the depth set in TVG Distance, the gain reaches the maximum of +32 dB. The gain level is flat even with deeper depths than this.</p>	<p>The base depth is 1 m: The gain increases with depth following the TVG graph patterns above.</p> <p>After the depth reaches that set in TVG Distance, the gain level is flat even with deeper depths. (Max. +40 dB for gain)</p>

While the previous version increased gain at shallow water by increasing the TVG value, v1.05 decreases the gain at shallow water by increasing the TVG value similar to commercial Fish Finder models. The following table shows the difference in TVG gain patterns.

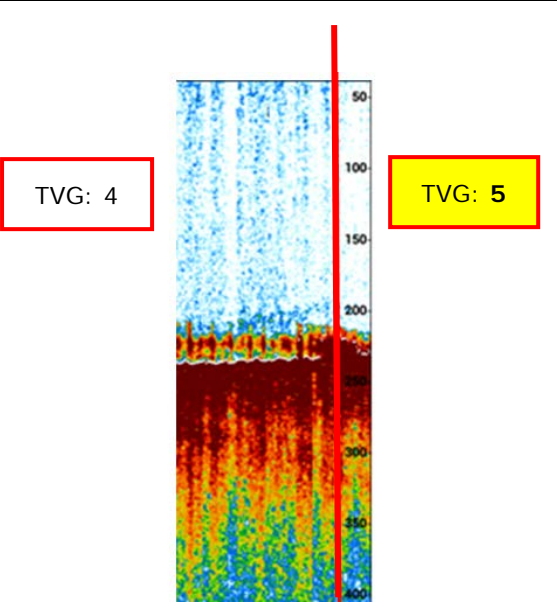
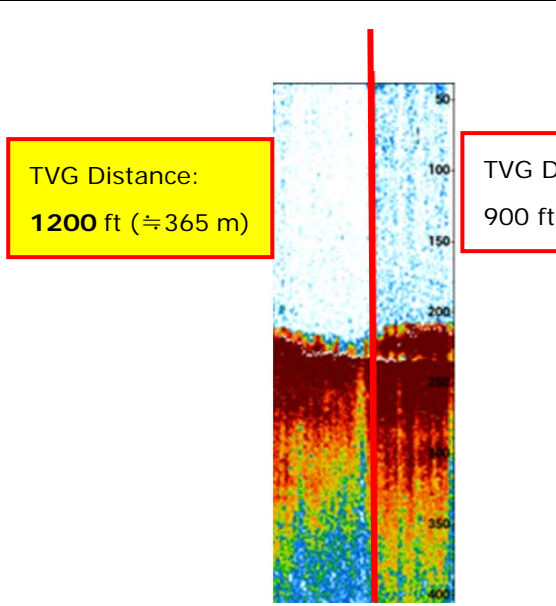
Pattern 1 – Decrease shallow water gain with more TVG value	Pattern 2 – Increase shallow water gain with more TVG value
NavNet TZtouch3 (TZT12F/16F/19F) built-in Fish Finder, DFF3, DFF-3D (v1.05 and later)	NavNet TZtouch2 (TZTL12F/15F/2BB) built-in Fish Finder, DFF1, DFF1-UHD, BBDS1, DFF-3D (v1.04 or earlier)

Example - How Gain Is Adjusted by TVG Settings

DFF3D v1.05 also changes how the gain is applied according to TVG Distance. For example, when you intend to search for targets in deep water, you may want to suppress the gain for shallower water; it is not necessary to have high gain as you are not searching for targets in shallow water.

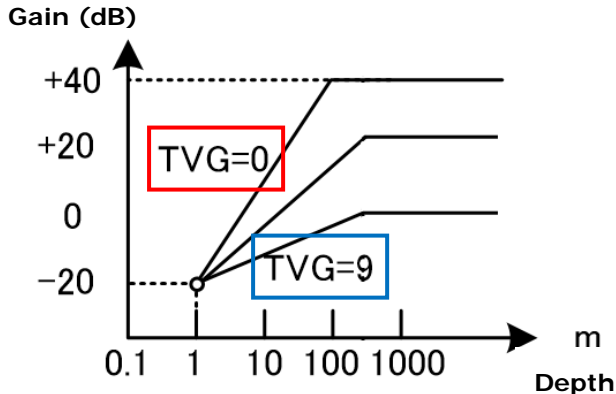
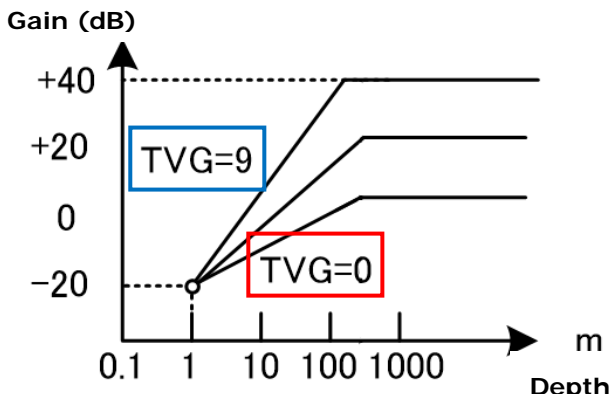
- ✚ With the previous v1.04 or earlier, changing the TVG value changed the overall gain at all depths, so it was difficult to adjust the gain for deep water while suppressing shallow water gain.
- ✚ With v1.05 software, if the TVG Distance is set to [400 m], the gain for depths deeper than 400m will be fixed to the maximum value, while the gain for depths less than 400m will be decreased proportionately.

The following screenshots show how the gain is applied differently depending on TVG value and TVG Distance settings.

Case 1 – Larger TVG Value	Case 2 – Longer TVG Distance
	
TVG Distance: Fixed to [1200 ft] (≅ 365 m) TVG: Changed from [4] to [5]	TVG: Fixed to [5] TVG Distance: Changed from [1200 ft] to [900 ft]
In Case 1, while fixing the TVG Distance setting to [1200 ft], the TVG value is increased from [4] to [5]. In Case 2, while fixing the TVG value setting to [5], the TVG Distance is decreased from [1200 ft] to [900 ft]. You can see that <u>the larger TVG value or larger TVG Distance suppresses shallower water returns.</u>	

2.2. TVG in Cross Section and Side Scan Mode

Cross Section and Side Scan modes have no TVG Distance setting: Only the TVG value graph is changed as follows.

New – V1.05 (TVG Distance: 400 m)	V1.04 or earlier (TVG Distance: 400 m)
	
<p>With larger TVG values, the gain at shallow water <u>decreases</u>.</p>	<p>With larger TVG values, the gain at shallow water <u>increases</u>.</p>
<p>The base depth is 1 m: The gain increases according to the graph pattern per TVG value above. The maximum gain (dB) is up to applied TVG values.</p>	

3. Notes for Update from Previous Versions

3.1. Default Settings

When updating the DFF-3D v1.04 or earlier to v1.05, note that the default values of beam width, beam angle, and clutter suppression will not be transferred after software update: Manually change each value if necessary.

If the TVG value and TVG Distance were used by default, i.e. TVG value: 5 and TVG Distance: 400 m, you can use as it is even after software update.

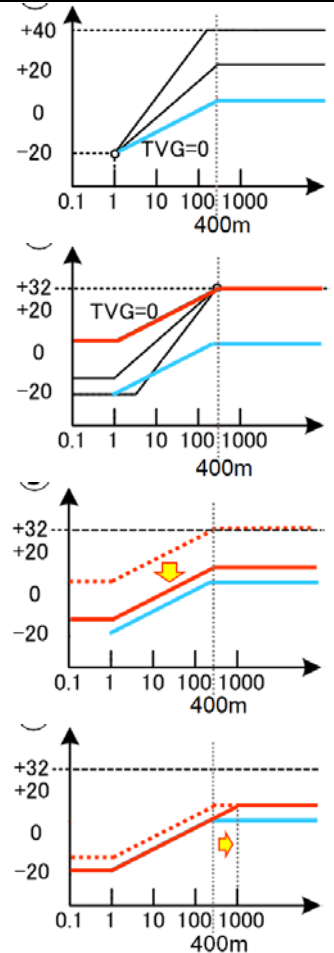
If the default TVG value and Distance have been changed with previous versions, how the TVG works changes after software update. In order to duplicate your settings to the previous versions, adjust the TVG value and TVG Distance referring to the [Section 3.2](#).

3.2. How to Duplicate v1.04 Settings on v1.05

In order to duplicate the TVG settings in Multi-Sounder mode, refer to the following graphs and tables. For Cross Section and Side Scan modes, refer to the comparison table of new and previous settings.

E.g. Multi-Sounder Mode – TVG Settings

- (1) The graph line in blue is from the setting of TVG: 0 and TVG Distance of 400m; from the previous v1.04. In order to duplicate the same graph pattern after updating to v1.05, proceed to the next steps.
- (2) The reclining pattern of the graph for TVG value is common regardless of versions, set TVG to [0] shown in red.
- (3) The graph set in (2) still has too high gain. Lower the gain from [50] to [0].
- (4) The gain in (3) is still high. Change the TVG Distance from [400 m] to [1000 m]. The graph pattern is almost identical to the one from v1.04.



For other setting values, refer to the concept above to reach the appropriate settings referring to the actual echoes shown on the screen.

Multi-Sounder TVG Settings – Comparison Table

New – V1.05	Previous - V1.04 or earlier
TVG: 0 / TVG Distance: 1,000 m Gain: 0	TVG: 0 / TVG Distance: 400 m Gain: 50
TVG: 3 / TVG Distance: 1,000 m Gain: 40	TVG: 3 / TVG Distance: 400 m Gain: 50
Default Settings (No change in value) TVG: 5 / TVG Distance: 400 m Gain: 50	Default Settings: TVG: 5 / TVG Distance: 400 m Gain: 50
TVG: 7 / TVG Distance: 150 m Gain: 50	TVG: 7 / TVG Distance: 400 m Gain: 50
TVG: 9 / TVG Distance: 100 m Gain: 50	TVG: 9 / TVG Distance: 400 m Gain: 50

Cross Section and Side Scan TVG Settings – Comparison Table

New – V1.05	Previous - V1.04 or earlier
TVG: 9	TVG: 0
TVG: 9	TVG: 1
TVG: 8	TVG: 2
TVG: 7	TVG: 3
TVG: 6	TVG: 4
TVG: 5	TVG: 5
TVG: 4	TVG: 6
TVG: 3	TVG: 7
TVG: 2	TVG: 8
TVG: 1	TVG: 9

4. Tips – Improved Resolution by TX Pulse Settings

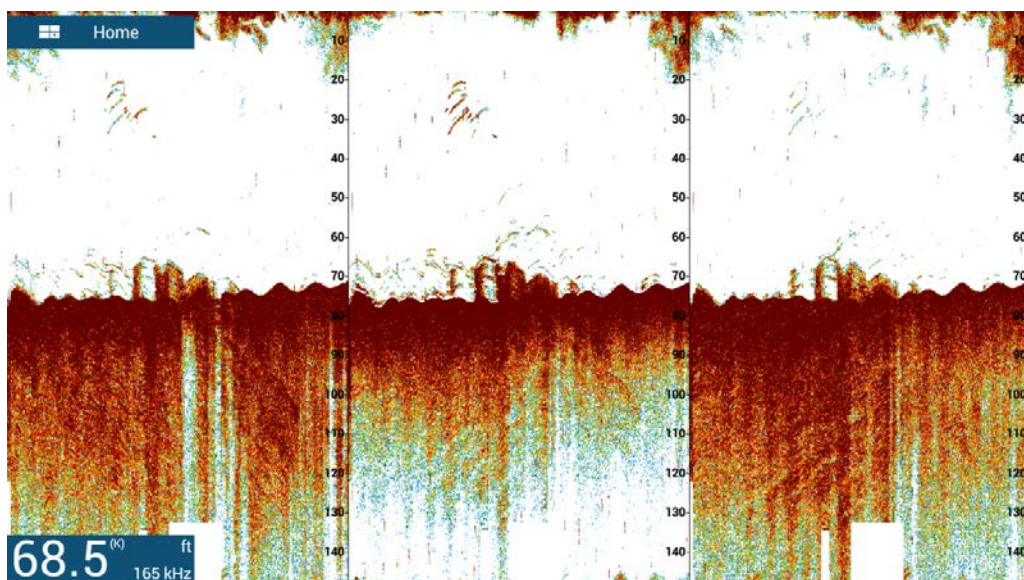
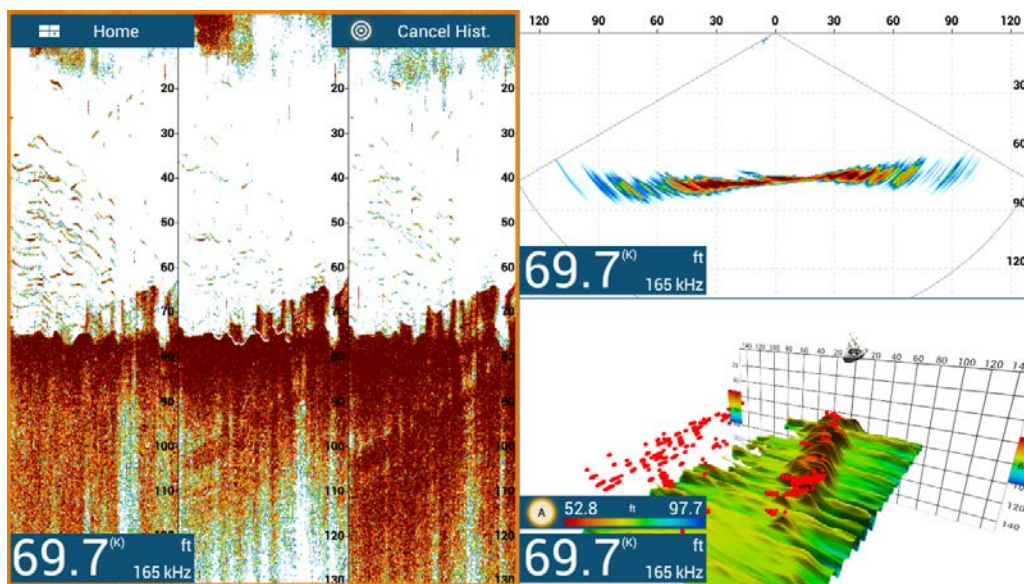
There were some cases where the DFF3D had lower resolution compared with the DFF1-UHD TruEcho CHIRP™ sounder. Range resolution improved by adjusting TX pulse settings. Although the content of TX pulse settings has not been changed since launching the product, these are good screenshots illustrating feedback from onboard a fishing vessel.

Proposed Settings:

In [Multi-beam Sonar] - [Initial Settings] - [TX Pulse], set [**Short 1**] or [**Short 2**] to see if the resolution improves.

E.g. - [Short 2]

At the depth of 70ft, individual fish targets in a group are well separated from each other. For operation at shallow depths, set a shorter TX pulse to improve separation.



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