Icom D-Star FM Deviation tests in DV mode - by John M. Wysocki ZL2TWS February 2025.

The following transceivers were tested using an HP 8901A Modulation Analyser and their respective +/- Peak Deviation measured.

Note that the early generation IC-2820 has the lowest deviation and is often the reason these rigs do not work well with repeaters that are not Icom or some homebrew hotspots. Icom repeaters regenerate DV, and then re-transmit, so this is never any issue via the genuine Icom repeaters. Older rigs such as IC-91, IC-92, ID-800 and ID-880 may also use the lower deviation but I had none of those rigs to test.

The IC-705 is the newest rig tested and is higher and closest to the ID-1 with the highest deviation. On 23cm band the repeater bandwidth was higher and DD mode was used for higher data transfer speeds so being higher than the others was no surprise.

Transceiver Model	+/- kHz Peak Deviation
IC-2820	1.316 kHz
ID-31A	1.560 kHz
ID-51A Plus	1.515 kHz
ID-52A Plus	1.570 kHz
ID-5100	1.570 kHz
ID-4100	1.614 kHz
IC-705	1.796 kHz
ID-1	2.000 kHz

Note: FM Voice deviation used on the same rigs is up to a maximum of +/- 5 kHz
and when DV modulated with GMSK D-Star the deviation is measured as per the above list.

The purpose of these tests was to understand why some MMDVM hotspots and homebrew FM talk through repeaters were more reliable than others. Often the lower or higher deviation rigs would cause drop outs via the hardware. In the cause of talk through FM repeaters the group delay was bad and not even. (A known problem with older FM repeaters)

MMDVM receivers were often over loaded with excessive audio level or struggled with not enough level. Some stations reported that one rig worked well while another would drop out.

I hope this information above helps to diagnose any issues mentioned above.

Hint: Deviation can be checked via a monitor FM rig with an AC millivolt meter connected across and external loud speaker. AC Millivolts (set for a level of around 100mV for easy comparison) and then compare rigs checking the mV of DV noise across the speaker.

73 and good DV, John ZL2TWS