About the frequency shifts of the 3rd and 4th generation DORIS beacons

The transmitted frequencies of 3rd and 4th generation DORIS beacons may be shifted with respect to the nominal DORIS frequencies to avoid jamming with other beacon in the vicinity. This function is used only when two channels or more are available on the satellite DORIS instrument that is to say with the 2G, 2GM and DGXX receivers.

The frequency shifts on both 400 MHz and 2 Ghz frequencies are deduced from a k multiplicative factor as follows:

$$p\_multik = \frac{4}{3} \times \left(\frac{87.0}{5 \times 2^{26}} \right)$$

with on the 2 GHZ channel: $\quad F_2 = F_0 \times 407.25 \times (1 + k \times p\_multik)$

with on the 400 MHZ: $\quad\quad F_1 = F_0 \times 80.25 \times (1 + k \times p\_multik)$

F_0 being the 5 MHz nominal frequency of the beacon USO.

K=0 gives the classical nominal values. It varies from -90 to +90 that corresponds to a range of -12.5 kHz to +12.5 kHz on the 400 Mhz.

K factor is given in the DORIS mail.
The list of the stations using the shifted mode and the corresponding K factor can be found at the following address:
ftp://ftp.ids-doris.org/pub/ids/stations/events/station_frequency_shift.txt

Reference document:

ftp.ids-doris.org/pub/ids/stations/Interface_Specification_Between_Beacons_And_Onboard_Instrument.pdf
(chapter 4.1)