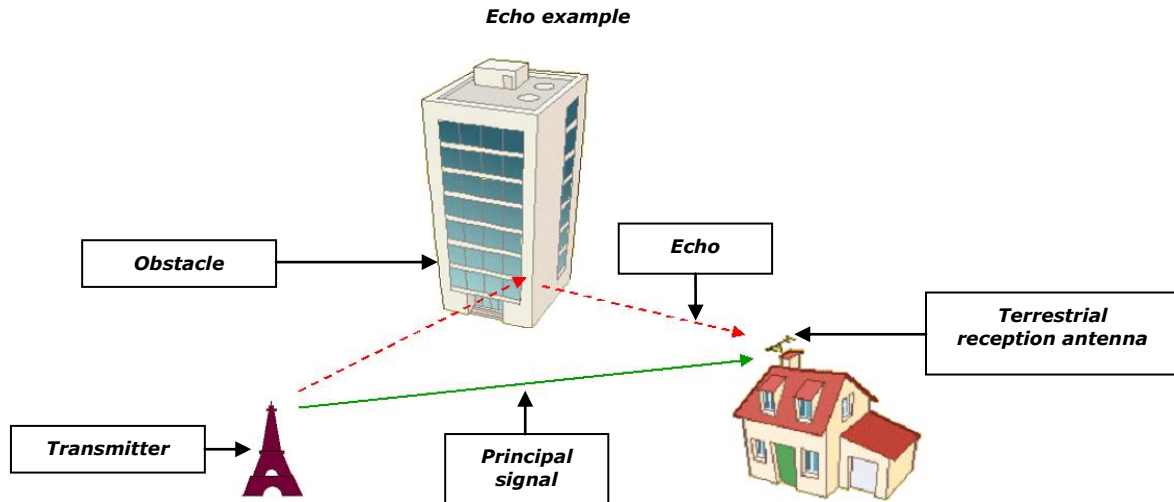


SEFRAM 7861 – 7862 – 7861HD – 7862HD field strength meters allow analysing the echoes received during a terrestrial reception. These measurements are directly linked to the reception quality, that's why it is important not to neglect them.

Definition

Echo :
In terrestrial TV broadcasting, echoes are the result of the multiple paths taken by the signal to transmit. In fact, wave propagation is subdued to its environment and these waves can come across various obstacles on their path. From the transmitter to the receiver, the propagation time is different for each wave. This phenomenon is called echo, the information arrives in many paths at different moments.

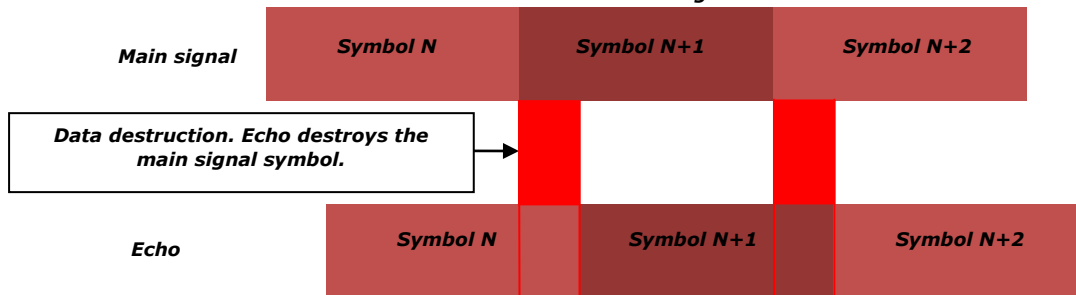
The delay of an echo compared to the main signal is given either in distance unit (km or mile) or in time unit (μ s).



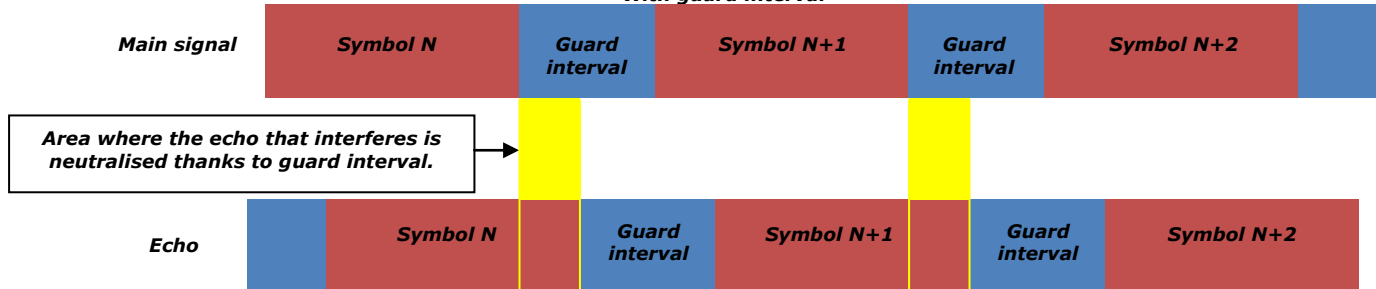
Guard interval :

For digital signals, guard interval corresponds to a time during which the reception is not interfered by echoes. During this guard interval, digital data transmission (symbols) breaks off in order to let the different echoes arrive on the receiver, before broadcasting new data. Digital signals and their increasing interference-sensitivity made the use of a guard interval necessary.

Without guard interval



With guard interval



The more guard interval is high, the more echo-resistance is efficient. Nevertheless, the useful symbol rate is lower. Generally, guard interval is represented by one of the 4 values given in the following board. According to the used coding, 2k or 8k COFDM, the guard interval duration is different. 8k COFDM, with a 1/32 guard interval, is commonly used because it permits having the highest symbol rate for a correct guard interval.

Guard interval	2k : minimum duration	8k : maximum duration	Best achievable symbol rate
1/32	7 μ s	28 μ s	24,13 Mbit/s
1/16	14 μ s	56 μ s	23,42 Mbit/s
1/8	28 μ s	112 μ s	22,12 Mbit/s
1/4	56 μ s	224 μ s	19,91 Mbit/s

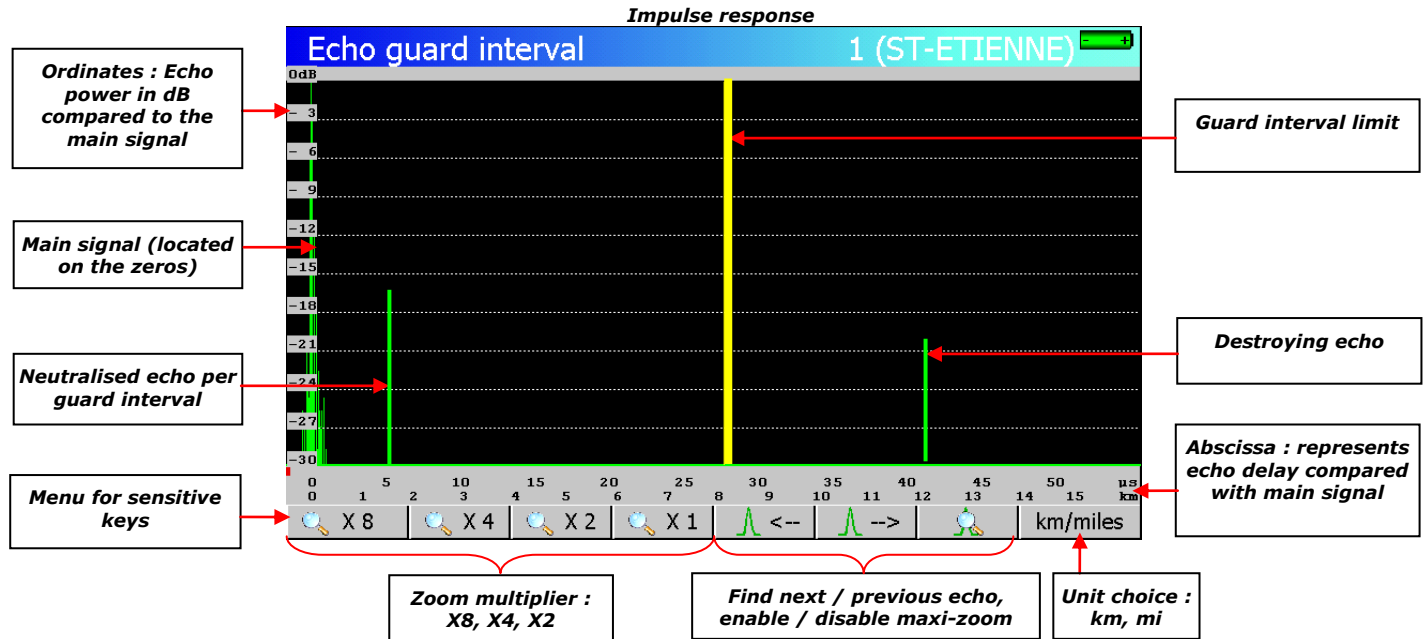
Time correspondence \rightarrow distance
 Speed of a wave = 300 000km/s
 1 μ s \rightarrow 300m
 28 μ s \rightarrow 8.4km

The "Impulse response" function of the field strength meter allows measuring different echoes.

Echoes measurement

- Select a channel broadcasting a digital multiplex (DVB-T/H standard).

- Press three times the "Measurements" key : 3X  .



Window characteristics:

\rightarrow In this window, the abscissa axis represents the delay of the different echoes and the ordinate axis represents their power. The reference is the main signal, it is located on the zeros of the two axis.

\rightarrow The green bars correspond to the received signals and the yellow line represents the guard interval end.

\rightarrow Different zooms are available and allow displaying echoes as well as possible.

\rightarrow The "Unit" sensitive key enables changing the unit in the abscissa axis between : μ s, km or mile.



If the yellow line doesn't appear on the screen, check that the zoom is not active (the guard interval may be outside of the field strength meter screen). To obtain a correct display, press "Zoom 1" and adjust with another zoom if necessary.

- Observe the possible echoes that appear furtively on the screen. Echoes that exceed the yellow line (on the right) are impacting signal quality and they have to be as small as possible. Echoes that are before (on the left) are included in the guard interval and they don't induce any data loss.

-If interfering echoes appear, you have to reduce their reception level by readjusting the antenna or choosing a more directionnal antenna.

Product link : http://www.sefram.com/wwwFR/F_quick_search.asp?st=7861