

Mars Microphone Modes

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The Mars Microphone is controlled by an 8 bit mode sent from the ground. This mode will control how the instrument is operated and data is compressed by the software. The 8 mode bits are divided into independent one and two bit fields that control various functions.

Bit 0&1: Gain:

These bits set the instrument gain (1x, 4x, 16x, 64x). Default is 64x.

Bit 2: SampleRate:

This bit controls both the sample rate for sound samples, and the filter bandwidths. The Low Frequency (LF) mode is the default. Bandwidths are nominal, and may be adjusted somewhat match digital filter capabilities. Filter zero is the sample nyquist filter (unfiltered in HF). The accumulation time has been set generate 8 packets of 2-bit compressed data (the instrument telemetry allocation is 10 packets per day when LIDAR is in Microphone mode)

Mode:	<u>LF</u>	<u>HF</u>
SampleRate:	5 KHz	20 Khz
Sample Time:	10sec	2.5sec
Filter 0:	DC-2.5 KHz	DC-10 KHz
Filter 1:	60-120 Hz	250-500 Hz
Filter 2:	120-250 Hz	500-1000 Hz
Filter 3:	250-500 Hz	1-2.5 KHz
Filter 4:	500-1000 Hz	2.5-5 KHz
Filter 5:	1-10 KHz	5-10 Khz

Bit 3&4: Filter Accumulation Time:

These bits control the length of each filter accumulation:

<u>Bit 3</u>	<u>Bit 4</u>	<u>Sample Accumulation Time</u>	<u>Packet Time</u>
0	0	10 minutes	57 hours
0	1	1 minute	5.7 hours
1	0	10 seconds	57 minutes
1	1	1 second	5.7 minutes

Bit 5: Telemetry Allocation

This bit controls the maximum amount of the telemetry that can be used by the filter data. The rest is sample data. If filter packets are produced slower than the

allocation, sample data is sent instead. If filter packets are collected faster than the allocation, then collection stops until a packet can be sent.

<u>Bit 5</u>	<u>Filter Packet Allocation</u>
0	50%
1	10%

Bit 6: Compression Mode

Sample data can be compressed to 2 or 4 bits per sample. Default is 2-bit.

<u>Bit 6</u>	<u>Bits/sample</u>
0	2
1	4

Bit 7: Clear Memory

This bit tells the system to erase previously collected sample and filter packets, and start collecting new packets from scratch.