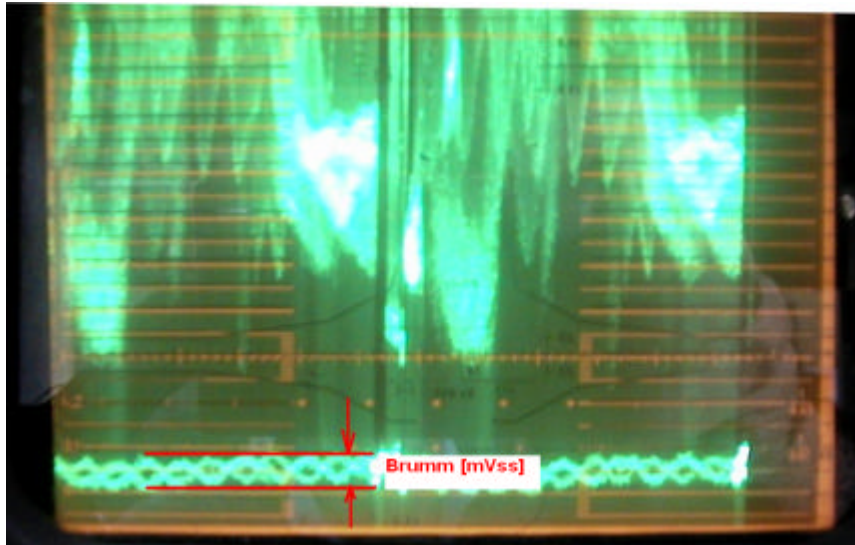


Hum measurements with the MSK200

Hum on an analogue signal:



The hum is an extra amplitude modulation of the RF signal and/or the video signal with a low frequency disturbing signal – usually 50 Hz from the mains. In the **50Hz Video Oscillogramme** (see figure above) this can be seen as a wave-form line on the video signal black shoulder or on the 50Hz synch. pulse (picture repetition impulse).

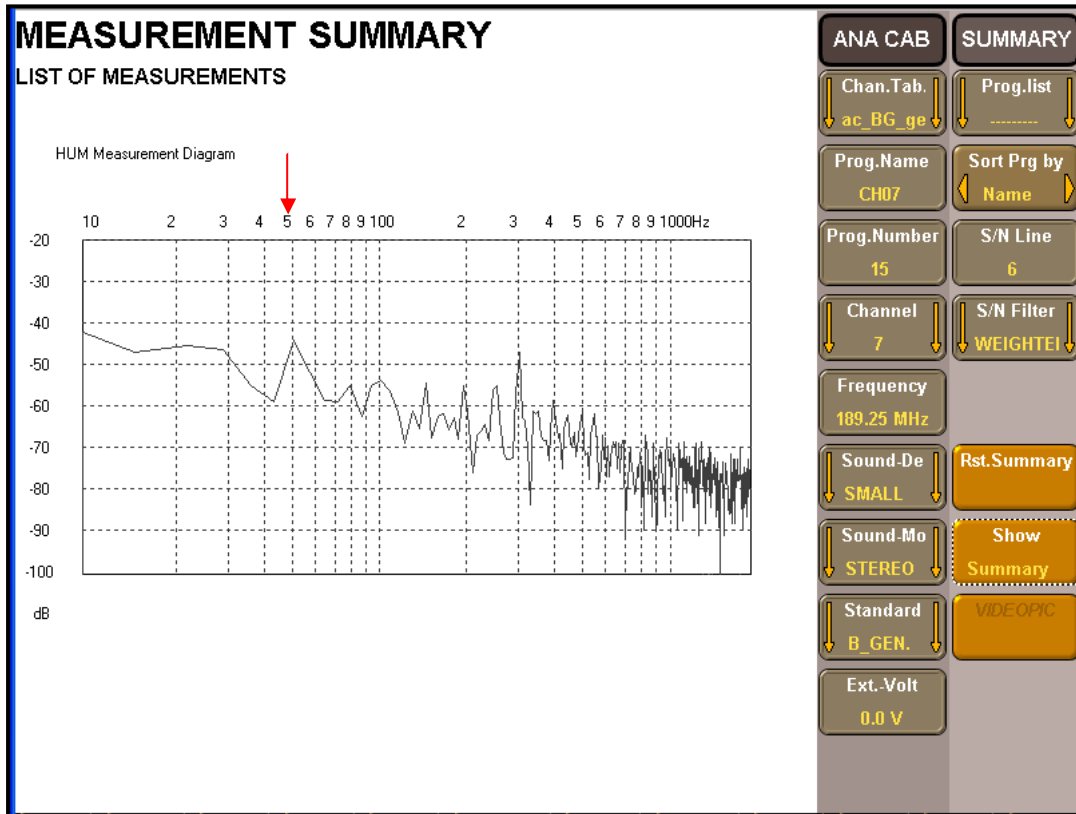
The MSK 200 offers the possibility to measure hum and other low-frequency disturbances up to 2kHz.

MEASUREMENT SUMMARY				
LIST OF MEASUREMENTS				
Measurement Type	Actual Value	Average Value	Minimal Value	Maximal Value
RF-Level	90.2 dBuV	90.3 dBuV	90.2 dBuV 28.10 15:22:00	90.3 dBuV 28.10 15:22:06
S/N	51.4 dB	51.6 dB	51.0 dB 28.10 15:22:05	53.1 dB 28.10 15:22:06
BER pre	not available	not available	not available	not available
BER post	not available	not available	not available	not available
MER	not available	not available	not available	not available
Video Upp	1219.3 mV	1217.4 mV	1208.3 mV 28.10 15:21:59	1285.9 mV 28.10 15:22:07
Subcarrier 1	-16.2 dB	-16.3 dB	-16.8 dB 28.10 15:22:04	-15.9 dB 28.10 15:22:00
Subcarrier 2	-19.5 dB	-19.2 dB	-19.5 dB 28.10 15:22:01	-17.6 dB 28.10 15:22:03

PRESS HUM Diag Button for HUM Diagram

ANA CAB	SUMMARY
Chan.Tab ac_BG_ge	Prog.list -----
Prog.Name CH07	Sort Prg by Name
Prog.Number 15	S/N Line 6
Channel 7	S/N Filter WEIGHTEI
Frequency 189.25 MHz	
Sound-De SMALL	Rst.Summary
Sound-Mo STEREO	Show HUM Diag.
Standard B_GEN.	VIDEOPIC No Hardwa
Ext.-Volt 0.0 V	

Selecting the Hum diagramme **[ANALYZE]** **[SUMMARY]** **[Show HUM Diag.]**.



The upper scale shows the hum disturbance spectrum. **The 50Hz line is marked in red.**
The scale on the left shows the hum ratio in dB.

In the example a hum ratio of 45 dB is shown at 50Hz.

The subsequent peaks in the curve are generally the harmonics of the 50Hz mains hum (100, 200, 300Hz aso.), but may also be disturbing frequencies from switched mode power supplies a.s.o.

Limit values:

The level value on the left scale indicates the difference in dB to the hum voltage for a video signal of 1 Vpp (1000mVpp).

Ideal value:

$$46\text{dB} = 0,5\% = 5\text{mV}$$

Minimal value on headend output:

$$40\text{dB} = 1,0\% = 10\text{mV}$$

Worst value at subscriber (worst-case):

$$34\text{dB} = 2,0\% = 20\text{mV}$$

Hum is visible in a TV picture at approx. 40mV = 4% = 28dB!

Calculation dB / % / mVss:

Converting the dB value in % (= inverse log for voltage):

$$10^{\text{dB}/20} \text{ – in example for } 45\text{dB: } 10^{45/20} = 177,8 \quad \text{In \% of 100: } 100 / 177,8 = 0,56\%$$

That is 0,56% of 1000 mVpp is therefore **5,6mVpp** disturbing voltage.

Reverse calculation for control:

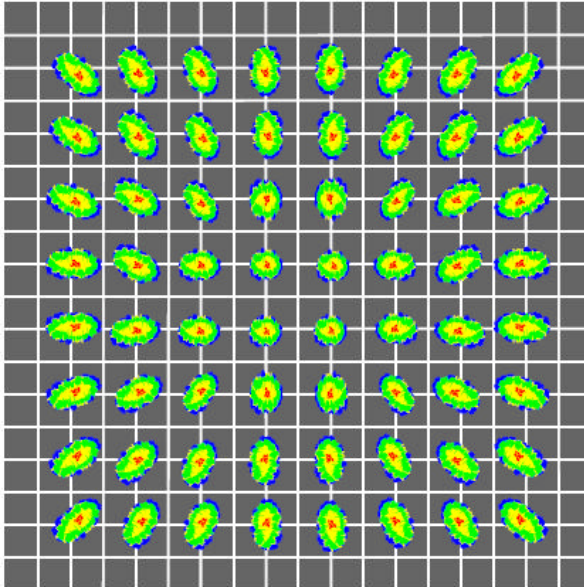
$$20 \times \log(100/0,56) = 45\text{dB}$$

Hum on QAM signals:

A hum modulation on a QAM signal caused by a faulty power supply in the distribution line or in the signal processing will be seen as a low MER value.

Remember that:

At least 32dB is needed for 64QAM and 36dB for 256QAM at the subscriber.



Typical disturbance in the constellation diagram with hum transmission.

As the cable receiver newly generates the video signal based on the information from the data stream, the transmission hum fault will normally not be seen on the hum diagramme of the MSK200.

If a hum can be seen in the video signal from the cable receiver, then this is probably caused by the (faulty) cable receiver or the TV-set (monitor).

One can though also test this using the MSK 200 if one checks the video signal generated by the receiver.

Process:

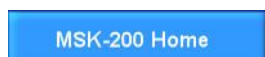
Connect the Scart cable from the receiver with the Scart socket on the MSK 200.

[\[SOURCE\]](#) [\[AV/TS INP\]](#) [\[AV INPUT\]](#) [\[CVBS/RGB_SCART\]](#)

[\[ANALYZE\]](#) [\[SUMMARY\]](#) [\[Show HUM Diag.\]](#)

The hum ratio at 50Hz should be at least 45dB!

Click on the links below to return to LBA's Website:



Orders & Inquiries Here



or

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800-522-4464 or 252-757-0279

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