

Student 1 – Name

Student 2 – Name

Group Date/hour

FIRST LABORATORY

AMPLITUDE MODULATED SIGNALS WITH HARMONIC CARRIER SIGNAL

A) Determining the division factor

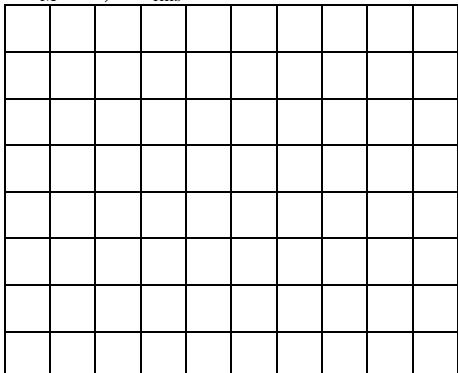
OUTPUT LEVEL [dBm] = θ =

B) Determination of the modulation index using spectral measurements

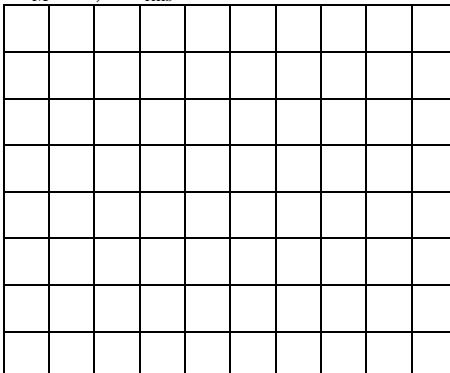
C) Determination of the modulation index using measurements in time domain

A_M [V _{rms}]	2A _{max} [V]	2A _{min} [V]	<i>m</i>	<i>m</i> [%]
0,6				
1,0				
1,4				
1,8				

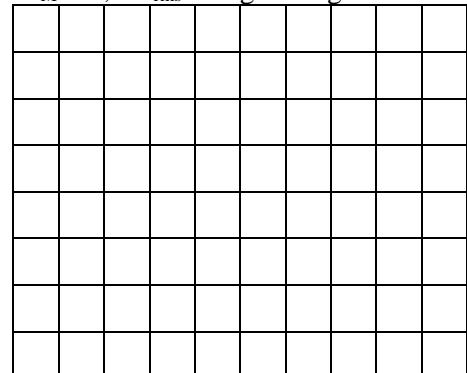
$$A_M = 0,6 V_{rms}$$



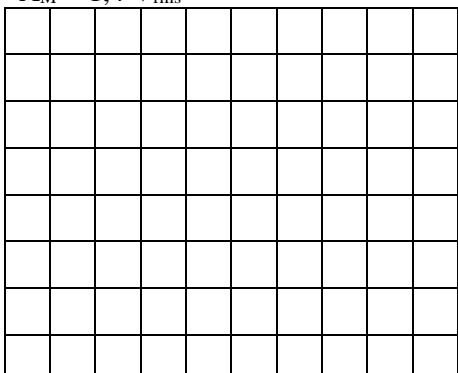
$$\underline{A_M = 1,0 \text{ V}_{\text{rms}}}$$



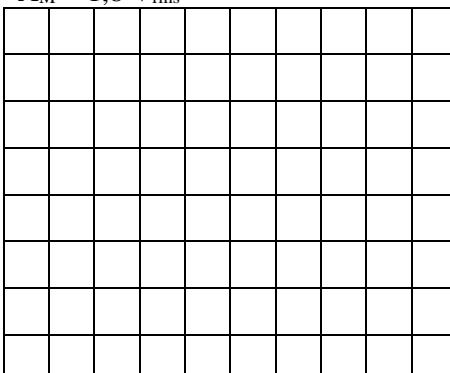
A_M = 1,0 V_{rms} triangular signal



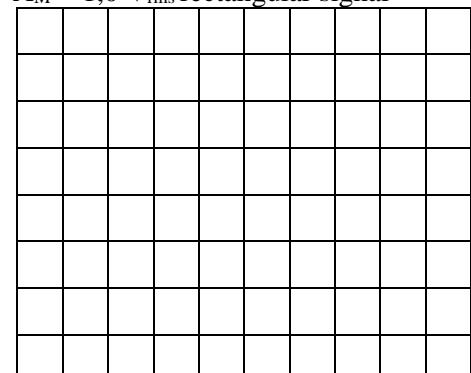
$$A_M = 1,4 V_{rms}$$



$$A_M = 1,8 \text{ V}_{\text{rms}}$$



$A_M = 1,0 \text{ V}_{\text{rms}}$ rectangular signal



D) The measurement of the bandwidth occupied by the AM signal, B_{MA} , using the spectrum analyzer

$$B_{MA} = \quad \quad \quad B_m =$$

Observation:

E) The bandwidth of the amplitude modulated signal generator is measured

$$B_{MA} =$$

F) Rectangular message signal

G) $B_{MA} =$

H)

I) Triangular message signal

$$B_{MA} =$$

K) The characteristic of the modulator is drawn $m = f(A_m)$ on millimeter paper. $K_A =$

K) The amplitude spectrum of the MA signal is drawn on a millimeter sheet for all effective values of the amplitude of the message signal

L) The power of the modulated signal for the sinusoidal modulating signal

A_m [V]	P_1 [mW]	P_2 [mW]	$X_{1\text{ef}}$ [V]	$X_{2\text{ef}}$ [V]	P_{U1} [mW]	P_{U2} [mW]	$\frac{P_{U1}}{P_1}$	$\frac{P_{U2}}{P_2}$
0,6								
1,0								
1,4								
1,8								

M) The spectrums of normalized amplitudes $\frac{A_k}{A_0}$ and $\frac{A_k}{A_1}$ according to frequency, for the MA signal, respectively $\frac{A_{k,p}}{A_{1,p}}$ for the modulating signal, are drawn on a millimeter sheet.

N) The power of the MA signal with a rectangular message signal

P_1 [mW]	P_2 [mW]	$X_{1\text{ef}}$ [V]	$X_{2\text{ef}}$ [V]	P_{U1} [mW]	P_{U2} [mW]	$\frac{P_{U1}}{P_1}$	$\frac{P_{U2}}{P_2}$

O) The power of the MA signal with a triangular message signal

P_1 [mW]	P_2 [mW]	$X_{1\text{ef}}$ [V]	$X_{2\text{ef}}$ [V]	P_{U1} [mW]	P_{U2} [mW]	$\frac{P_{U1}}{P_1}$	$\frac{P_{U2}}{P_2}$