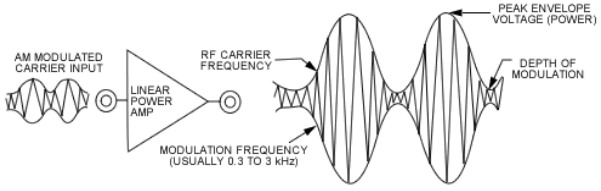
Peak Envelope Power

PEP (AM)

% Modulation = ((V_{PEP} - V_{Pc}) / V_{Pc}) *100%

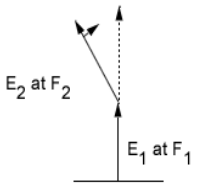
Example:
Carrier Power P_C = 100 W, PEP = 400 W.
Determine % Modulation

M% = ((V_{400} - V_{100}) / V_{100}) *100% = ((20-10) / 10) *100% = 100%



MOD. DEPTH	AVERAGE POWER INCREASE DUE TO MODULATION		RATIO OF PEP TO CARRIER POWER	
M%	dB = 10 LOG $(1 + M^2 / 2)$	RATIO	dB = LOG $(1 + M)^2$	RATIO
30	0.19	1.05	2.3	1.7
50	0.51	1.13	3.5	2.3
70	0.95	1.25	4.6	2.9
80	1.21	1.32	5.1	3.2
85	1.34	1.36	5.3	3.4
90	1-48	1.41	5.6	3.6
95	1.62	1.45	5.8	3.8
100	1.76	1.50	6.0	4.0

MULTIPLE CARRIERS



Phasor Representation

Voltage Maximum

Example:
F_1 = 10 MHz
F_2 = 10.1 MHz
$E_1 = E_2$ = IV
RL = 1 Ohm

SINGLE CARRIER CASE (F_1 o n l y)

P = E^2 / R = $(1)^2$ / 1 = 1 Watt CW or PEP

TWO CARRIERS CASE (F_1 & F_2)

The voltage phasors, E_1 & E_2 are at a maximum every 10 microseconds since:
Coincidence Rate = 1 / (F_2 - F_1) = 1 / ((10.1 - 10) *10^6) = 10 Microseconds

At coincidence E_1 & E_2 add directly, therefore:
P = E_2 / R = $(1+1)_2$ / 1 = 4 Watts PEP

N CARRIERS CASE ($F_1 + F_2 \ldots + F_n$)

$P = E_2 / R = N_2 / 1 = N_2$ Watts PEP

NUMBERS OF CARRIERS	POWER IN EACH CARRIER FOR 7 W PEP OUTPUT	PEP OUTPUT POWER FOR N 1 W CARRIERS
N	$P = 1 / N^2$ Watts	$P = N^2$ Watts
1	1 W	1 W
2	250 mW	4 W
3	111 mW	9 W
4	63 mW	16 W
10	10 mW	100 W