Amplitude Modulation

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Notice

- Reference for objective type question paper has been placed in Book shop .
- The Chapter 1 and 2 Will prepare you for both Midterm (Objective + Subjective) and Viva Questions.
- 30 MCQs will be shared on via website by Monday (sweedishchap.weebly.com
- Remember : Assignments/Examples are very Important

Power Factor in Terms Of I

- Power can also be calculated in terms of current , as it is easy to measure the current across the know resistor/Load . As we all know that

$P=I^2R$: So our equation will become

$P_t=I_t^2R$

Where I_t is

$$I_T = I_c\sqrt{(1 + m^2/2)}.$$

Quick Example

- The total output power of an 85 percent modulated AM transmitter, whose unmodulated carrier current into a 50 Ohm antenna load is 10 Ampere

Hmm Easy Just Apply the formula

$I_t=I_c\sqrt{(1+(m^2/2))}$

Where $I_c = 10$

$m = 0.85$

$I_t=10\sqrt{(1.36)} = 11.67$ Amp

NOW CALCULATE POWER

6809 W

Find Modulation Factor

$$I_T = I_c\sqrt{(1 + m^2/2)}.$$

$$m = \sqrt{2\left[\left(\frac{I_T}{I_c}\right)^2 - 1\right]}$$

Find Modulation Factor

$I_t = I_c \sqrt{(1+(m^2/2))}$

Where $I_c = 10$

$I_t = 10\sqrt{(1.36)} = 11.67$ Amp

NOW CALCULATE Modulation Index

Question

An antenna has an impedance of 40 Ω. An unmodulated AM signal produces a current of 4.8 A. The modulation is 90 percent. Calculate (*a*) the carrier power, (*b*) the total power, and (*c*) the sideband power.

Question

a. $P_c = I^2R = (4.8)^2(40) = (23.04)(40) = 921.6$ W

b. $I_T = I_c\sqrt{1 + \frac{m^2}{2}} = 4.8\sqrt{1 + \frac{(0.9)^2}{2}} = 4.8\sqrt{1 + \frac{0.81}{2}}$

$I_T = 4.8\ \sqrt{1.405} = 5.7$ A

$P_T = I_T^2R = (5.7)^2(40) = 32.49(40) = 1295$ W

c. $P_{SB} = P_T - P_c = 1295 - 921.6 = 373.4$ W (186.7 W each sideband)

Remember you can also calculate via $P_{SB} = \frac{P_c m^2}{4}$

Quick Test

- Electronic Communication came in to being
  Late 19th Century , Beginning of 19th Century 18th Century
- _____ medium by which data is sent from TX to Rx
  Antenna, Channel, Decoder
- Transducer is _____
- Three main types of communication system are ___ __ ____
- _____ is undesirable interference , which is added when signal travels through _____
  Amplitude , Medium, Noise, Frequency

Quick Test

- Define Duplex, Simplex and half Duplex
- Data used in computer is ____
  - Digital, Analog
- The most common Digital code used for data representation in world is
  - ASCII, MORSE CODE. DYNMO CODE
- Original signal may be referred as
  - Baseband signal , broad band signal

Quick Test

- Three basic parameters that can be altered in modulation process are _____
- Voice signals are example of
  - Continuous signal, analog signal
- Recovering original signal out of recived signal is called
- The process of transmitting two or more baseband signal together over a common medium is called _____

Quick Test

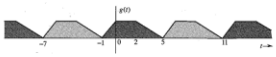
- Underwater radar is called
  - Sonar, Micro radar, CWT radar
- Radar take the advantage of ____ property of Radio waves
  - Reflection , refraction , Polarization
- Radio waves have components of
  - Electrical and magnetic signal , Electrical Component , Magnetic component

Quick Test

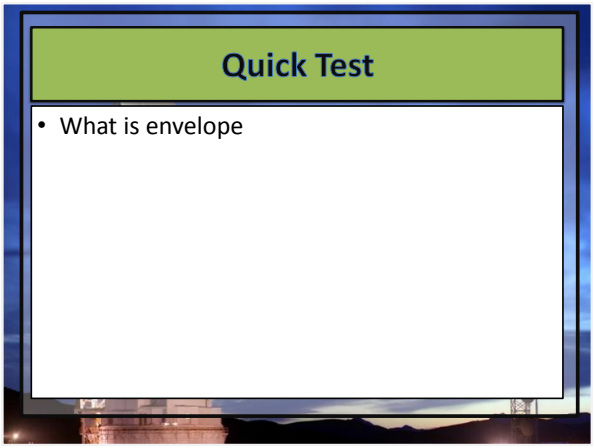
- A signal that have a f of 18 MHZ, have a wavelength of
- The band width of signal blow is
- 
- f1 f2
- Messages travel from transmitter to receiver with help of
  - Transmitter,Receiver,channel,antennas
- A signal which repeats itself after a certain time period is known as
  - Even signal,Odd signal,Aperiodic signal ,Periodic signal

Quick Test

- 1. The signal blow is
  - Aperiodic signal , Periodic signal ,Both



- The spectrum space occupied by signal is called _____
- The new signal transmitted below and above Fc are called _____


Quick Test
• What is envelope