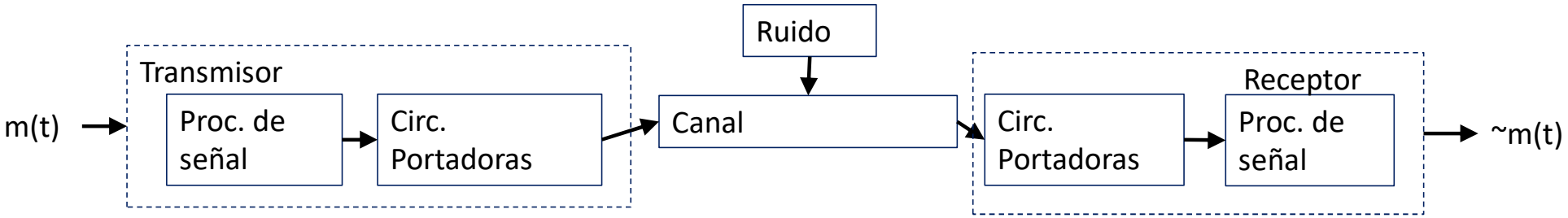
Universidad Tecnológica Nacional
Facultad Regional Haedo
Departamento de Ingeniería Electrónica

SISTEMAS DE COMUNICACIONES

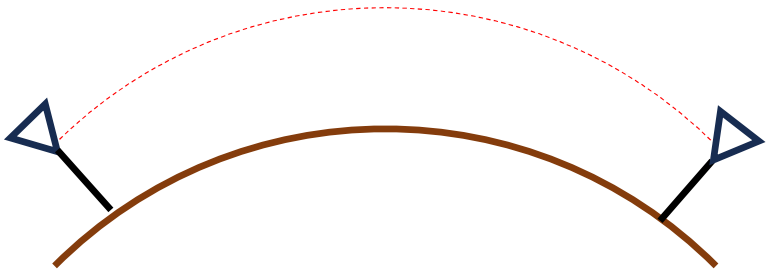
AM (con portadora)

Componentes de un SC



…

AM Radio difusión: Onda Terrestre



Onda terrestre:

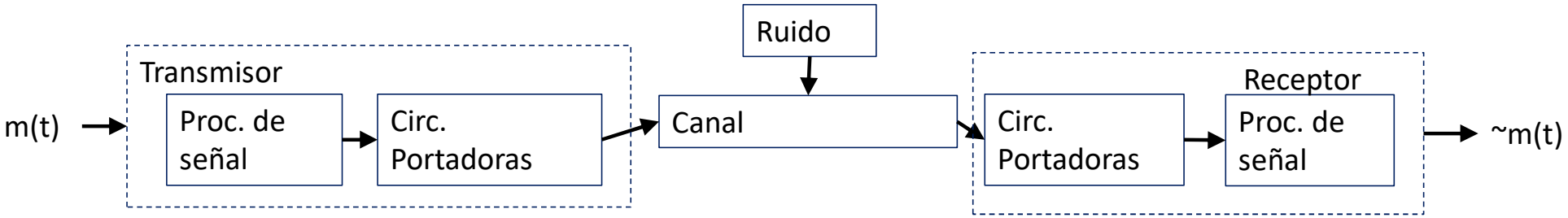
El suelo actúa como condición de contorno.

F<2MHz

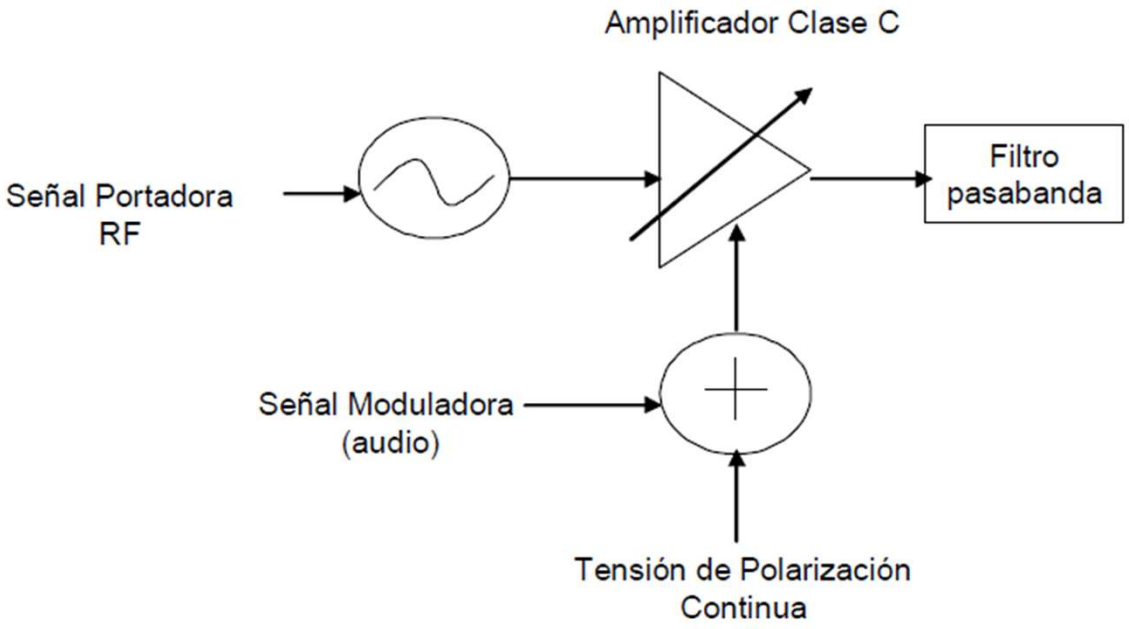
Frecuencias bajas => antenas grandes

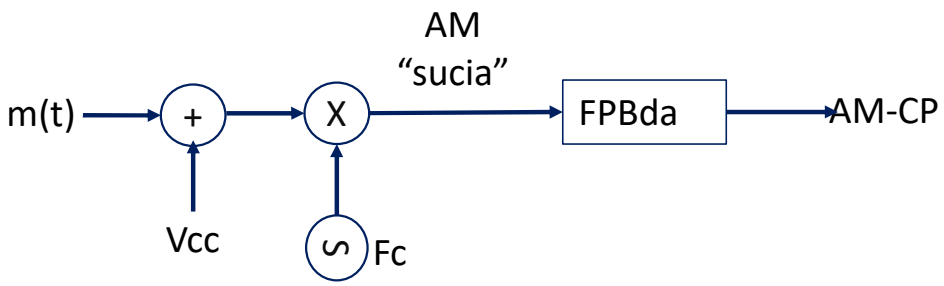
El suelo es un conductor imperfecto=> disipa potencia

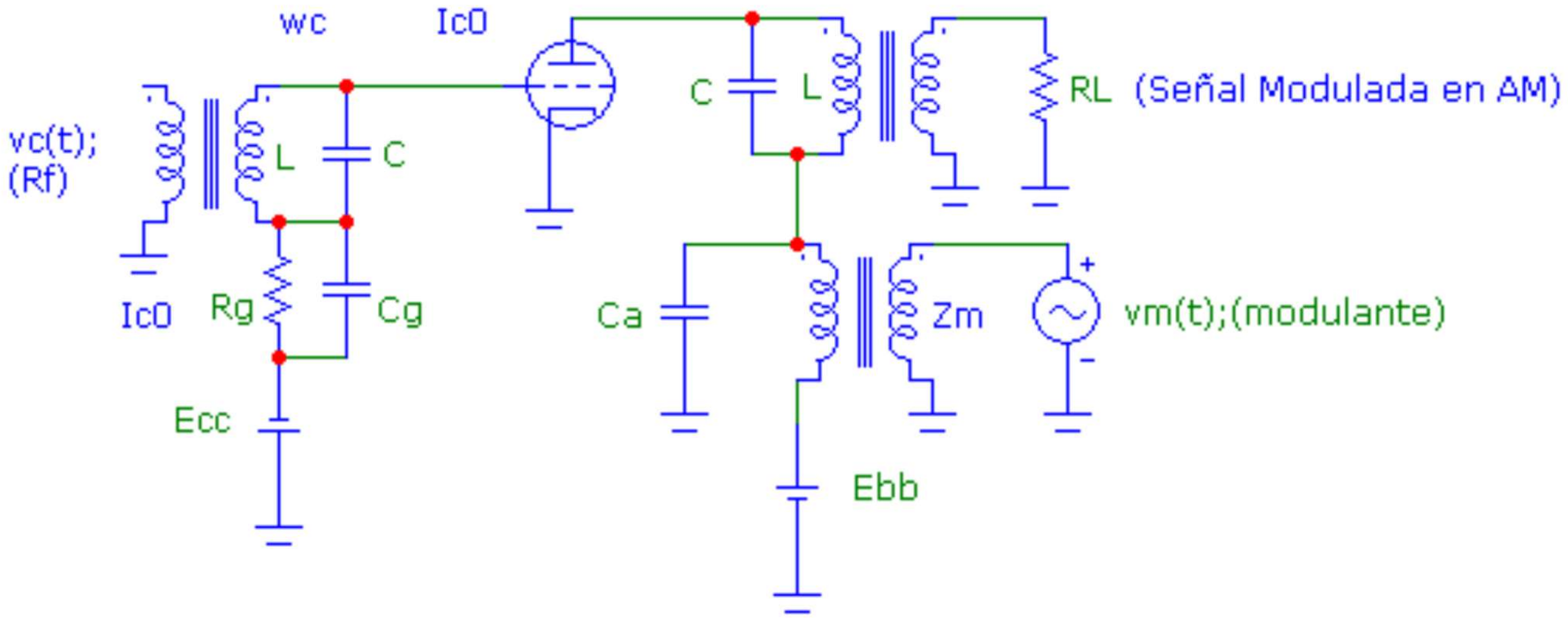
....

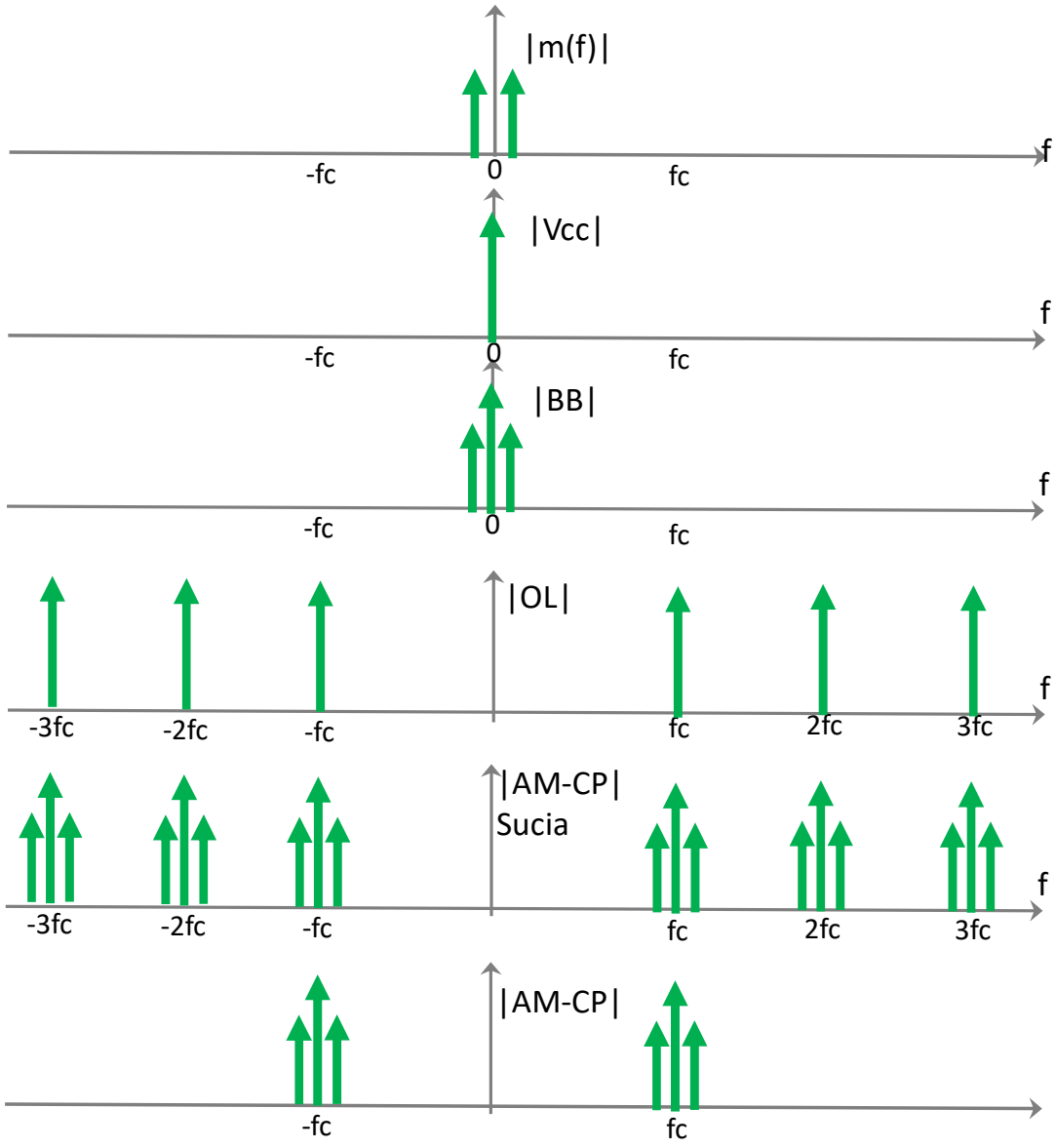

Ruido
Transmisor
Receptor
m(t)
Proc. de señal
Circ. Portadoras
Canal
Circ. Portadoras
Proc. de señal
~m(t)

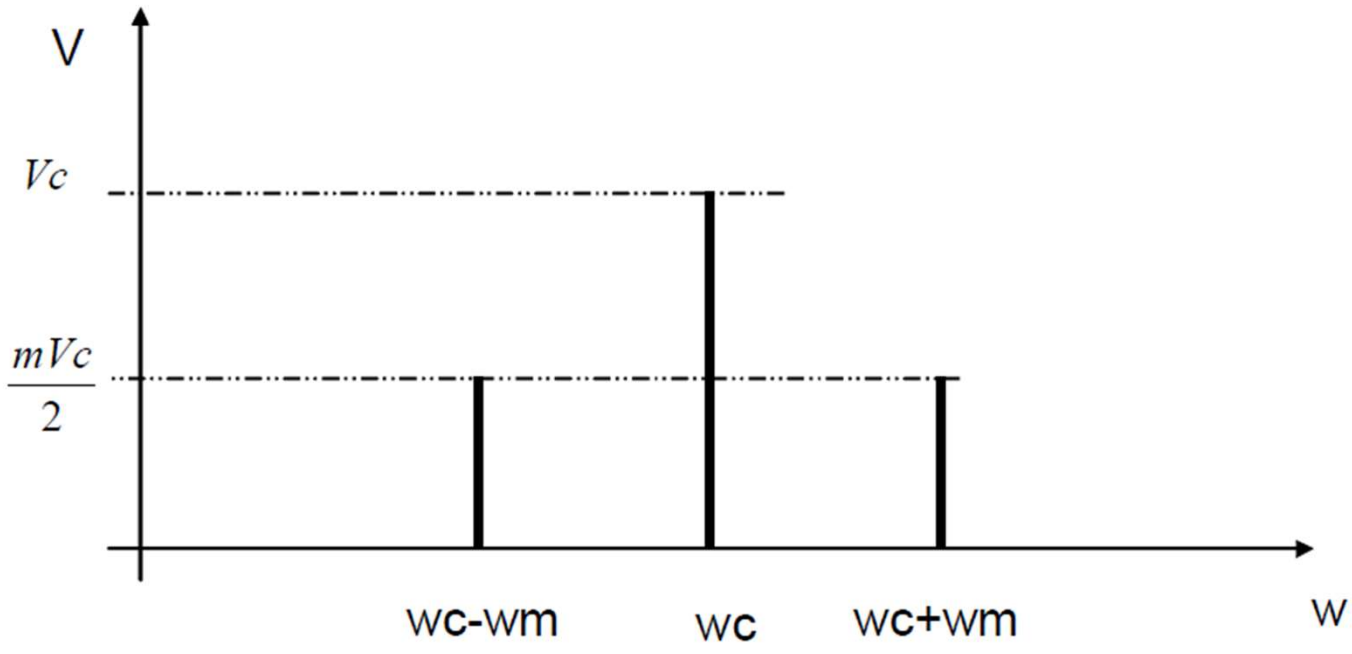
...


Amplificador Clase C
Señal Portadora
RF
Filtro
pasabanda
Señal Moduladora
(audio)
Tensión de Polarización
Continua

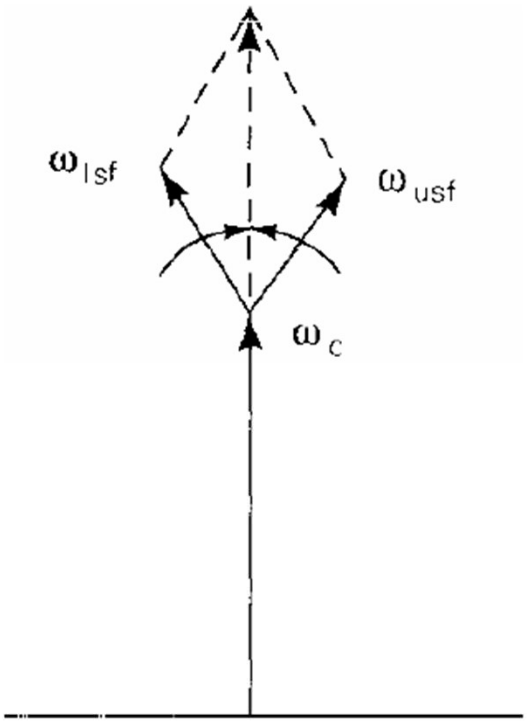

AM
“sucia”
m(t)
+
X
FPBda
AM-CP
Vcc
S
Fc


wc
Ic0
vc(t);
(Rf)
L
C
Ic0
Rg
Cg
Ecc
C
L
RL
(Señal Modulada en AM)
Ca
Zm
vm(t);(modulante)
Ebb

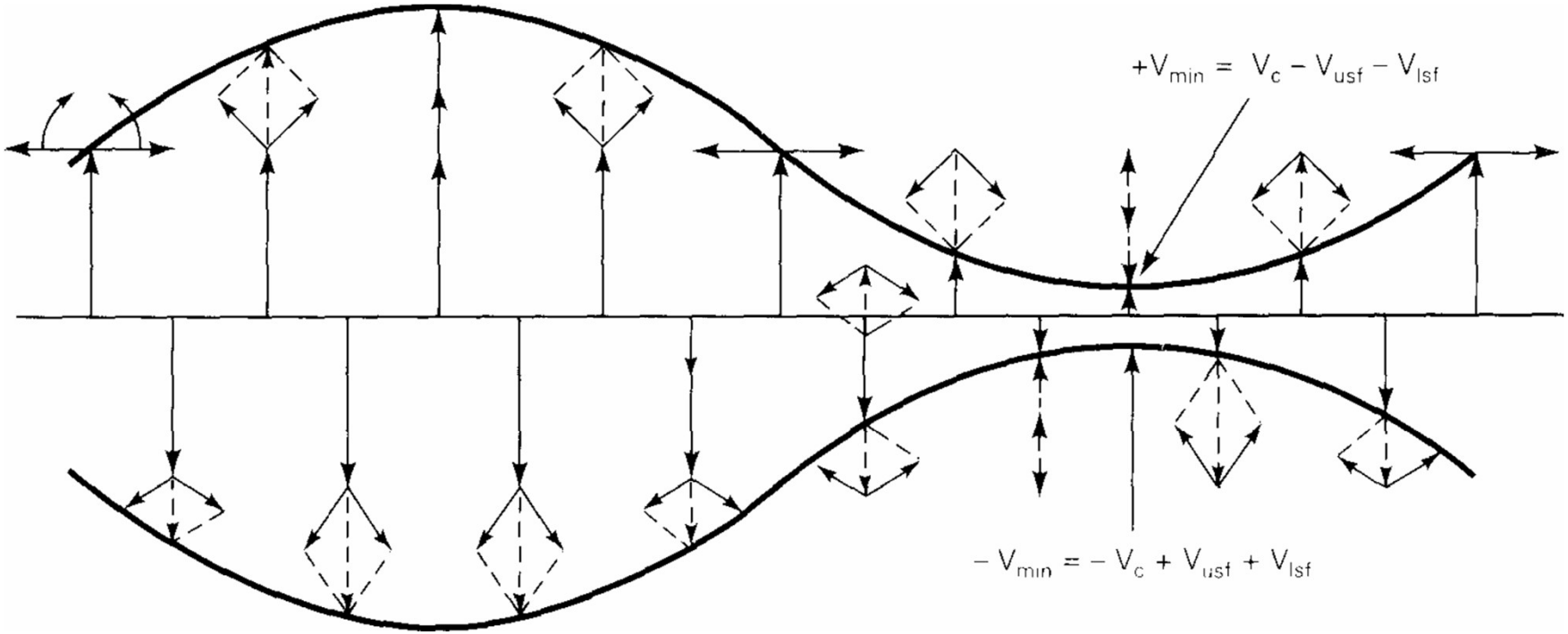

|m(f)|
f
-fc
0
fc
|Vcc|
f
-fc
0
fc
|BB|
f
-fc
0
fc
|OL|
f
-3fc
-2fc
-fc
fc
2fc
3fc
|AM-CP|
Sucia
f
-3fc
-2fc
-fc
fc
2fc
3fc
|AM-CP|
-fc
fc

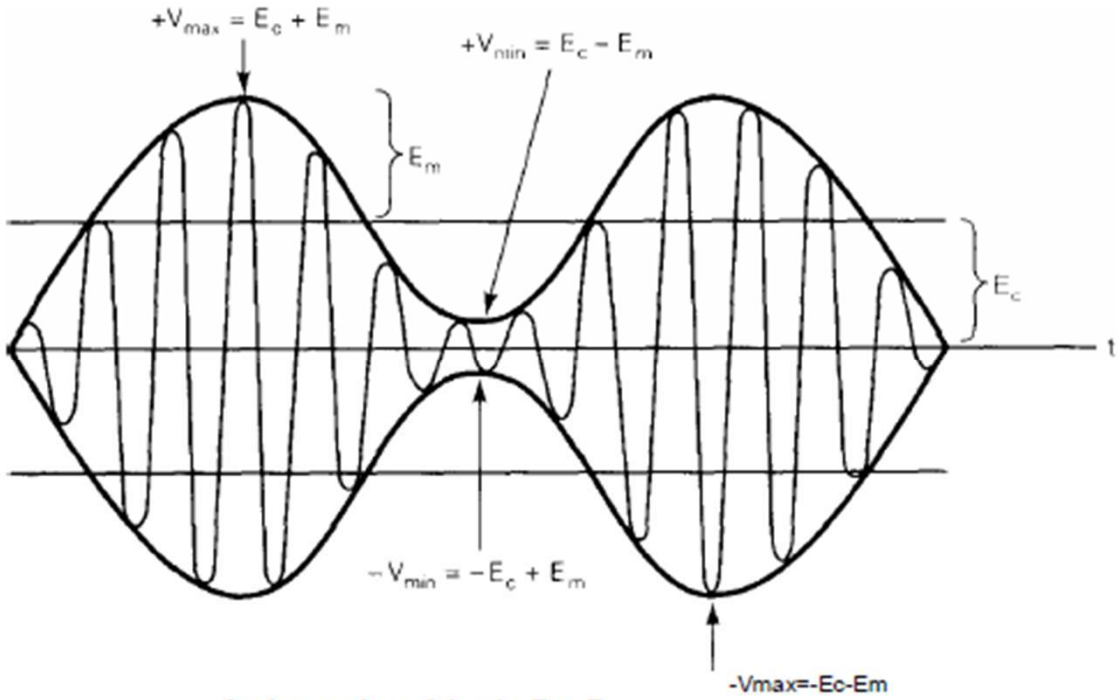

V
Vc
mVc
2
wc-wm
wc
wc+wm
w

$$v(t) = Vc.senwct + \frac{m.Vc}{2}.\cos(wc - wm)t - \frac{m.Vc}{2}.\cos(wc + wm)t$$



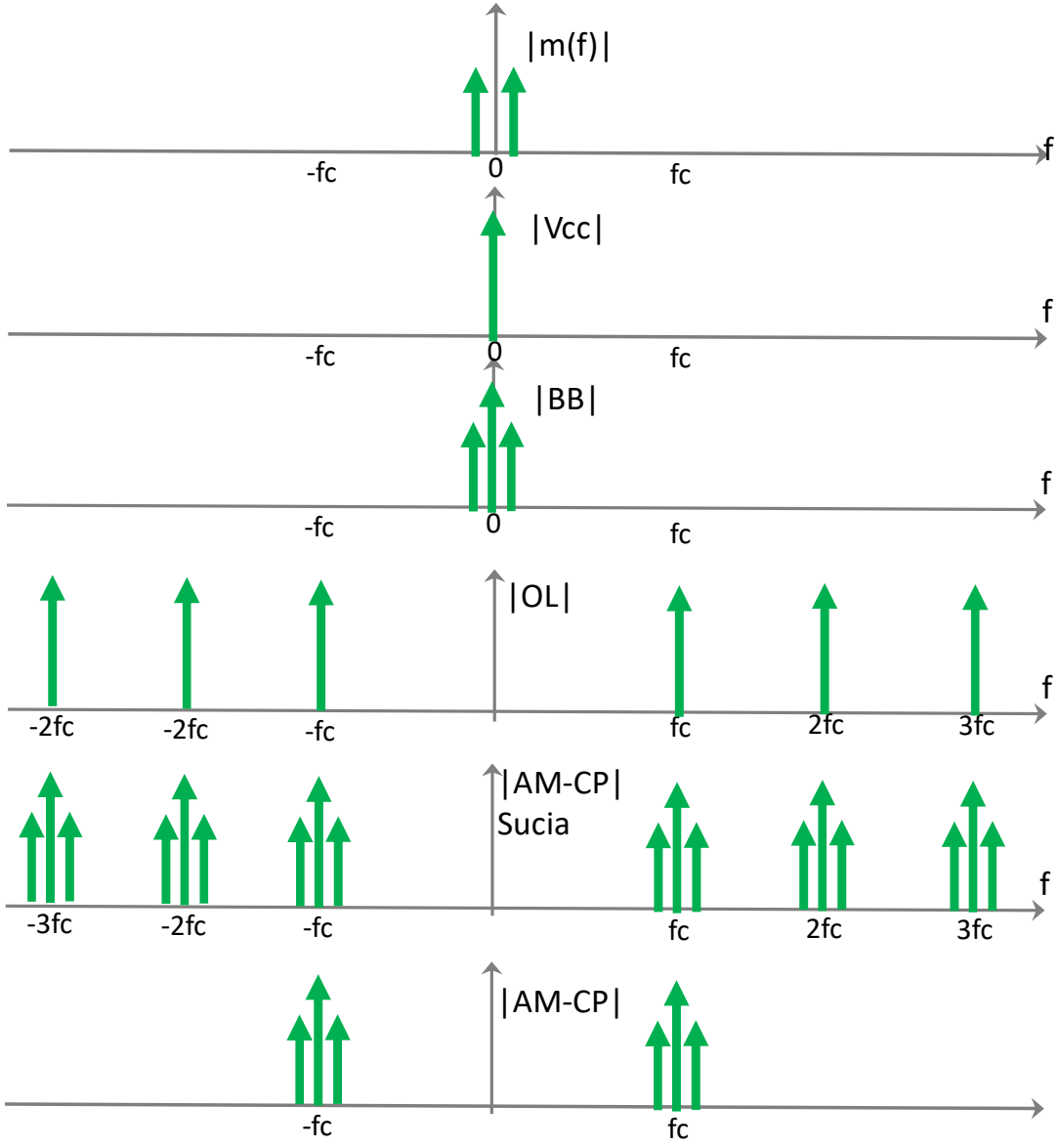

Technics
speed
33
45
TORQUE_STUDIO


$+V_{min} = V_c - V_{usf} - V_{lsf}$
$-V_{min} = -V_c + V_{usf} + V_{lsf}$

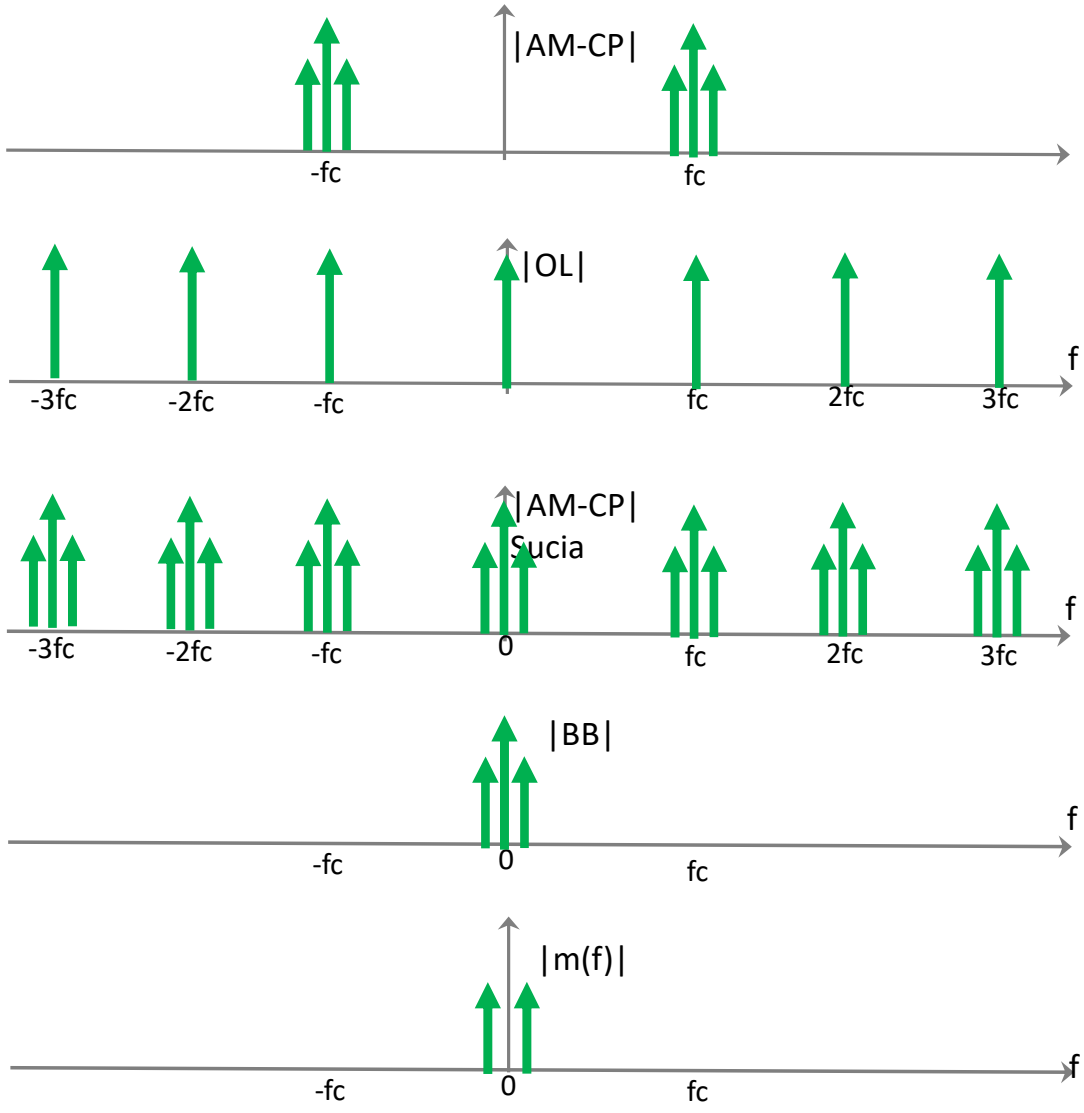


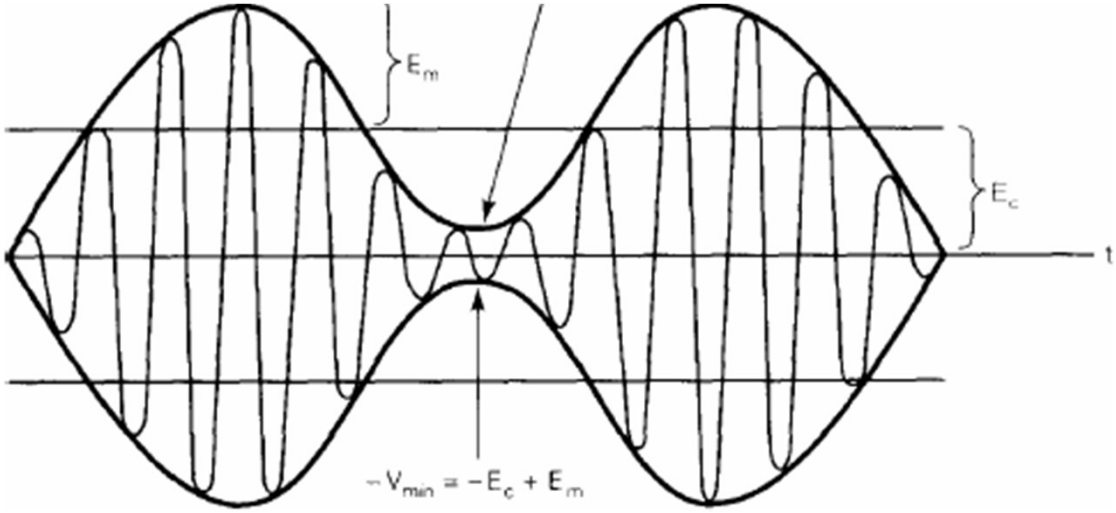
Coeficiente de modulación, E_m y E_c

Modulación

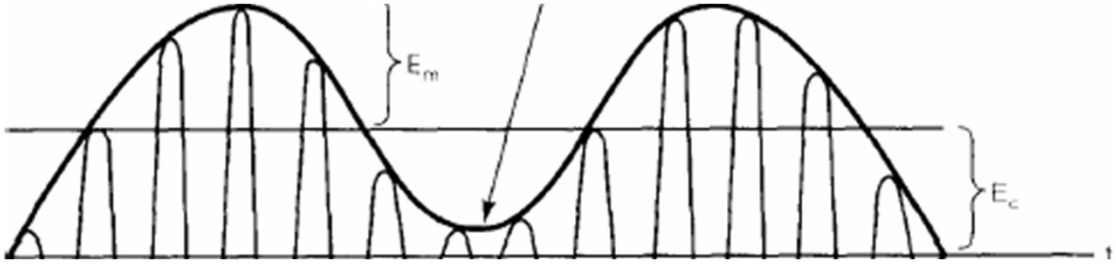

|m(f)|
f
-fc
0
fc
|Vcc|
f
-fc
0
fc
|BB|
f
-fc
0
fc
|OL|
f
-2fc
-2fc
-fc
fc
2fc
3fc
|AM-CP|
Sucia
f
-3fc
-2fc
-fc
fc
2fc
3fc
|AM-CP|
-fc
fc

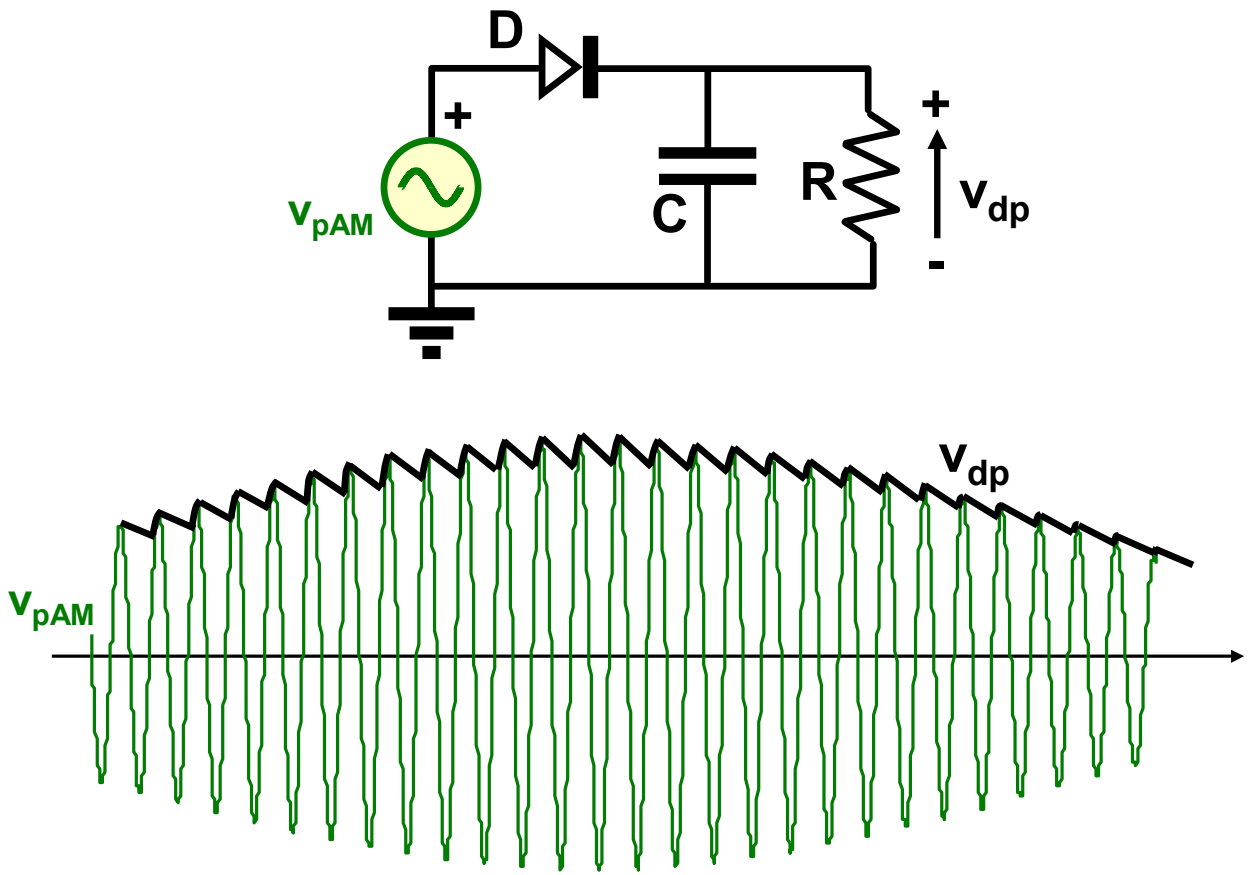
Demodulación

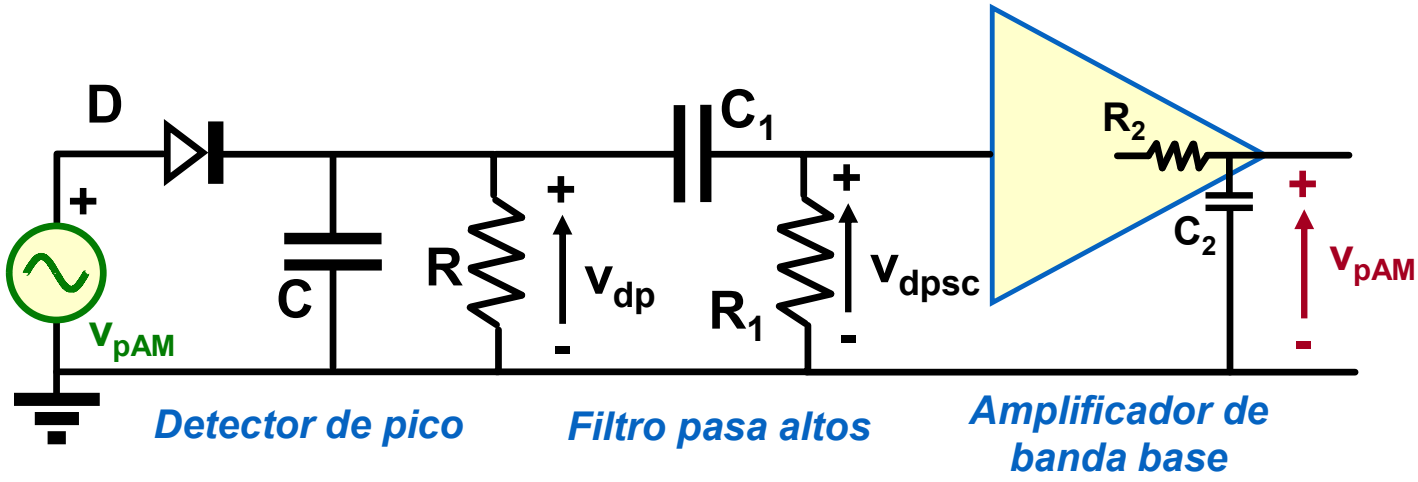


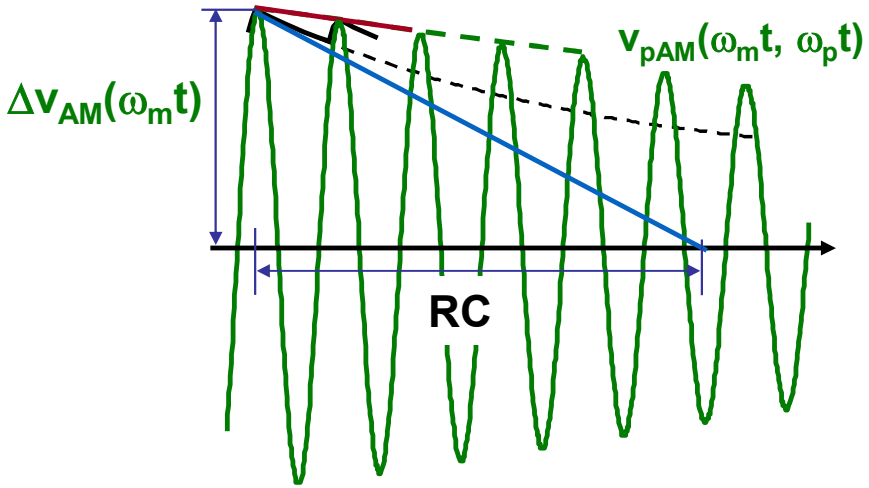

E_m
E_c
t
$-V_{min} = -E_c + E_m$

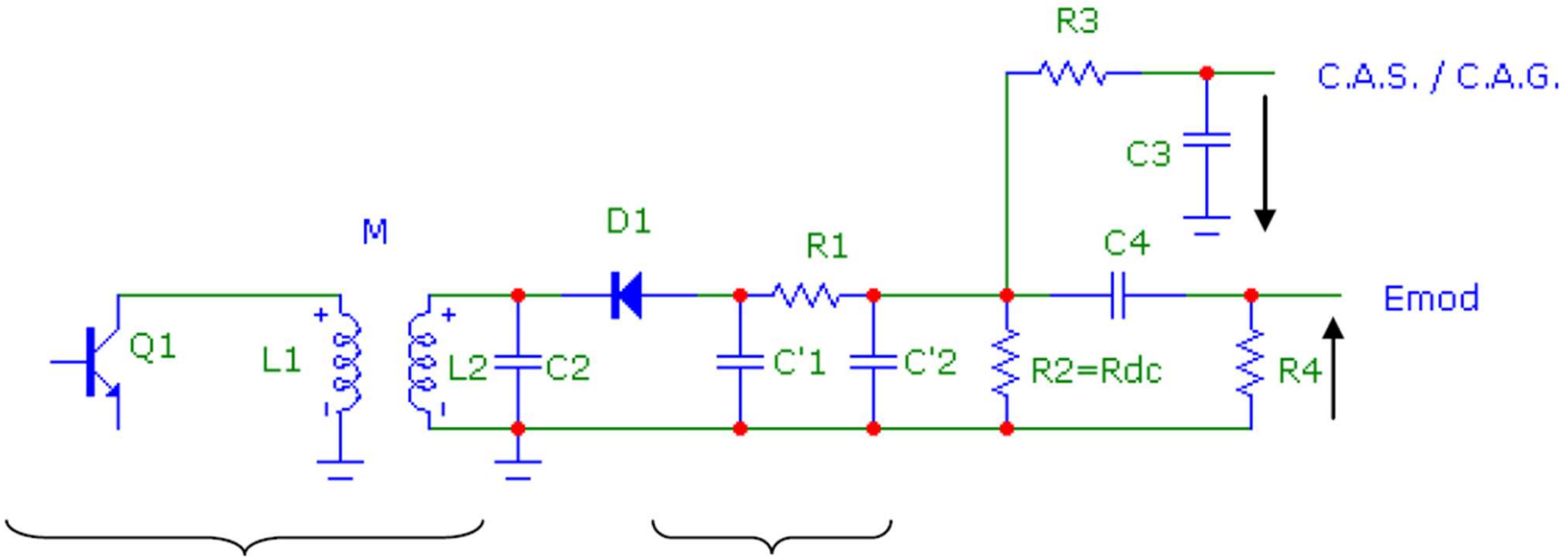

t


E_m
E_c
t


D
+
v_{pAM}
C
R
+
v_{dp}
-
v_{dp}
v_{pAM}

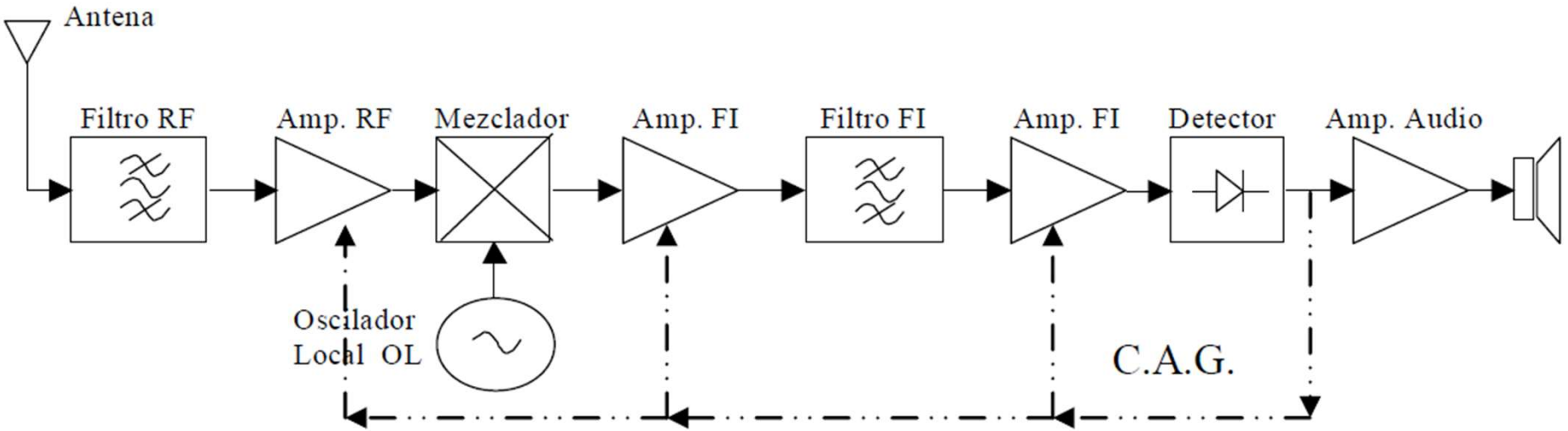

D
+
V_{pAM}
C
R
+
v_{dp}
-
C_1
+
v_{dpsc}
-
R_1
R_2
C_2
+
V_{pAM}
-
Detector de pico
Filtro pasa altos
Amplificador de banda base


$\Delta v_{AM}(\omega_m t)$
$v_{pAM}(\omega_m t, \omega_p t)$
RC



última etapa de F.I. Generador del Detector

Constituye un filtro de Rf, que provoca que la Rf se derive a tierra


Antena
Filtro RF
Amp. RF
Mezclador
Amp. FI
Filtro FI
Amp. FI
Detector
Amp. Audio
Oscilador
Local OL
C.A.G.