15.10.

Solution:

① For the flat-frequency case ($f_0 > W$), like below (Fig. 1)

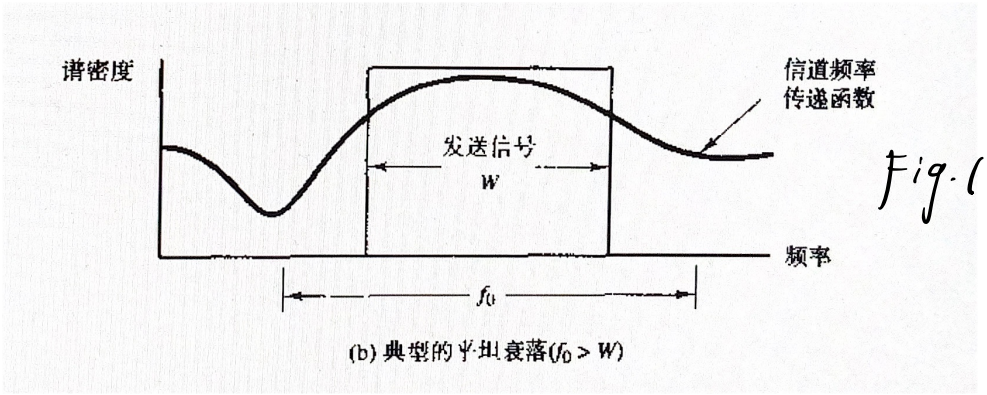


Fig. 1

As a mobile device radio changes its positions, it's possible that the received signal experiences frequency-selective distortion even $f_0 > W$, like below Fig. 2

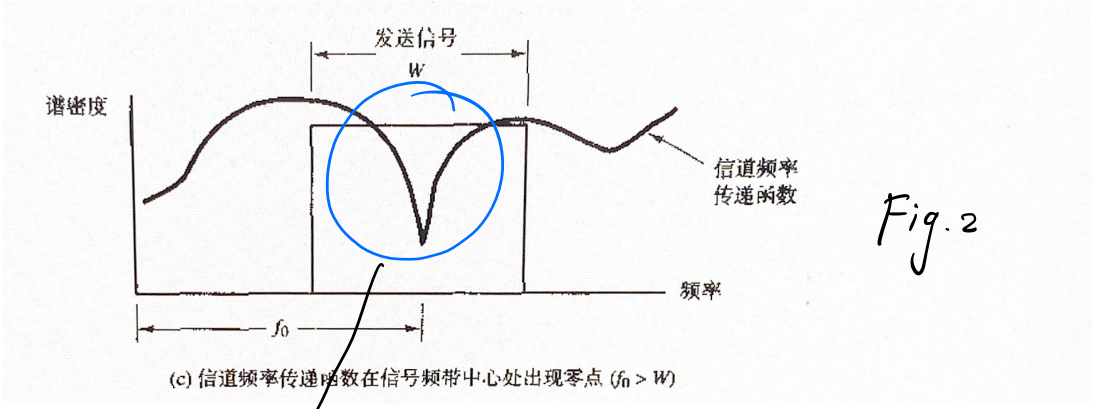
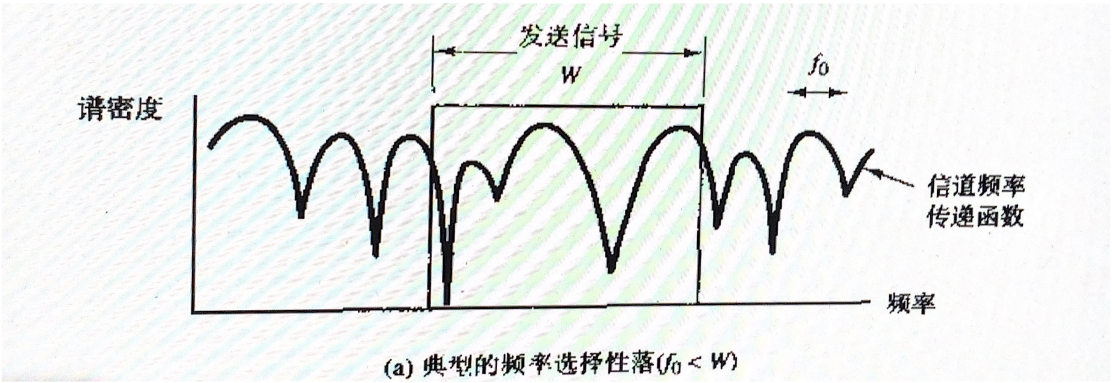


Fig. 2

The null of the channel's frequency transfer function occurs near the band center. So, even though the channel is flat-fading, it can be fregency-selective fading sometimes. A mobile radio can't exhibit flat-fading all the time. As $f_0 \gg W$, less time will be spent exhibiting the type of condition like Fig. 2.

And, common frequency-selective fading like below (Fig.3) is independent of the position of the signal band. In comparison, frequency-selective fading occurs all the time



(a) 典型的频率选择性落($f_0 < W$)

15.16.

Solution: (a) $B_C = \frac{1}{5\sigma_t} = \frac{1}{5\times10^{-5}} = 20\ KHz.$

(b) $T_C = \frac{0.5}{f_d} = 0.5\ s$

(c) Pulse duration = 1 μs. Thus, $W = R = 10^6$ pulse/s.

or $f_s = \frac{1}{T_s} = 10^6\ Hz > B_C$

∴ 是频率选择性衰落. 慢衰落.

frequence selective slow fading.

(d) To mitigate the frequency-effective effects of fading, we could reduce the pulse rate < 20 kpulses/s