WALID BIN KHALED
ID: 22-46101-1

1. 22-46101-1
AB-CDEFG1-H

User-1 = (B+C) = (2+4) = 6 Mbps

User-2 = (C+D) = (4+6) = 10 Mbps

User-3 = (D+E) = (6+1) = 7 Mbps

User-4 = (E+F) = (1+0) = 1 Mbps

User-5 = (F+G1) = (0+1) = 1 Mbps

User-6 = (G1+H) = (1+1) = 2 Mbps

User-7 = (H+E) = (1+1) = 2 Mbps

Guard band = (G1+H+B+5) = (1+1+2+5) = 9 Mbps

Starting from 0 MHz

Channel-1 0-6 MHz
Add 9 MHz GB

Channel-2 15-25 MHz
Add 9 MHz GB

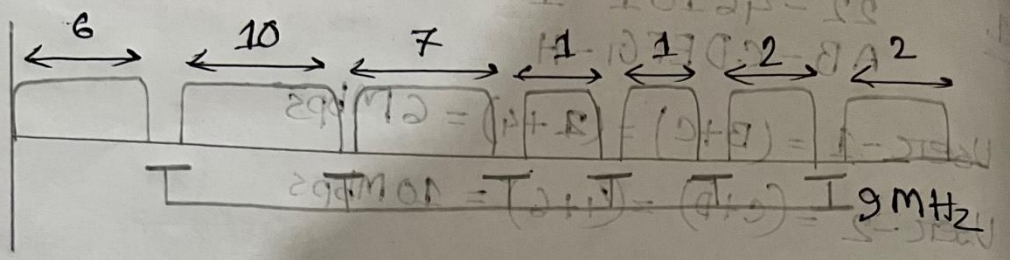
Channel-3 34-41 MHz
Add 9 MHz GB

Channel-4 50-51 MHz
Add 9 MHz GB

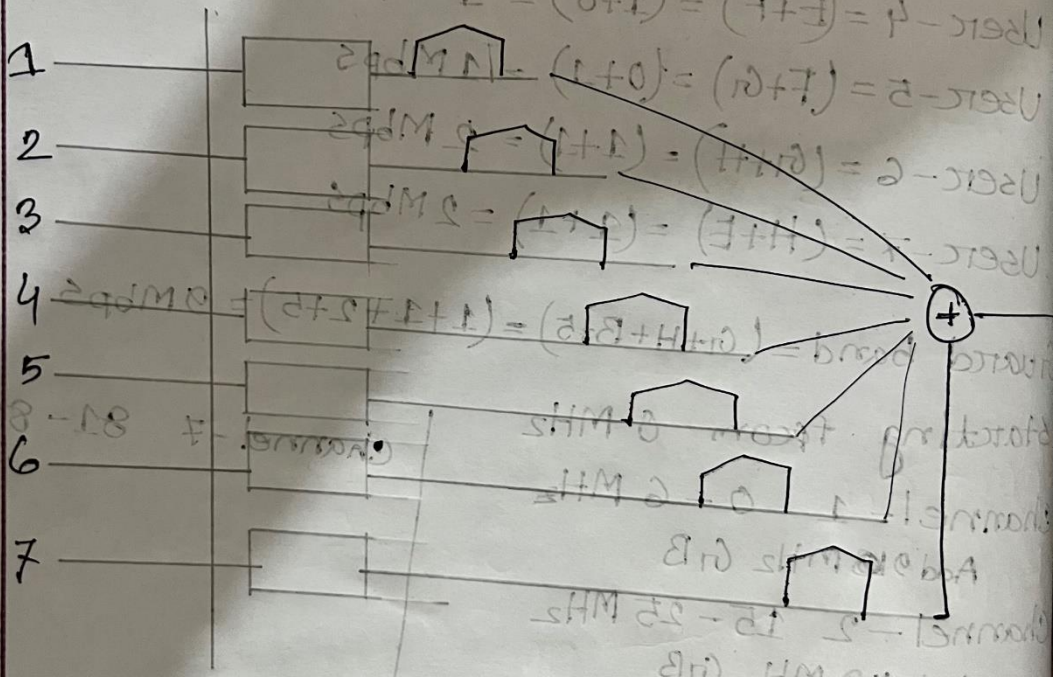
Channel-5 60-61 MHz
Add 9 MHz GB

Channel-6 70-72
Add 9 MHz GB

Channel-7 81-83



Modulatore + shifting



On demodulation side, bandpass filter B used to recover the signals.

Minimum bandwidth = 83 MHz

Walid Bin Khaled
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2. (a):

Source 1 = (B+C) = 6+1 = 7 Mbps
" 2 = (H+E) = 2 Mbps
" 3 = (D+E) = 7 Mbps
" 4 = (G+H) = 2 Mbps
" 5 = (C+D) = 10 Mbps
" 6 = (E+F) = 1+3 = 3 Mbps

As, F=0, It is replaced with 2 for less complica[ted] multiplexing meth[od].
Source 1 add ext[ra] 1 Mbps.

Source-1 is stuffed by 1 Mbps to reach 7 Mbps.
Source-2, 4, 6 are added and reach 7 Mbps.
Source-3 is left at 7 Mbps.
Source-5 is convert with 1/2 and then stuffed by 2 Mbps to reach 7 Mbps
Source-5 is extra 5 Mbps stuffed by 2 Mbps to reach 7 Mbps.

So, data rate = 7 Mbps (from a)

(b) So, for each character = 1 bit

(c) For each character are send per 1s at 7 Mbps; 7×10^6 characters " " ≈ 0.14285 μs
" 1 = 142.85 ms

(d) Frame rate = data rate (source)

= 7M frame per second.

(e) 7M ~~per~~ frame per 1 second

1 " " $\frac{1}{7 \times 10^6}$ "

= 142.85 mS

(f) So, statistical tdm Each frame consits of bits than numberc of channal/sources. So we can assume it is 4<5 is 4 bits perc frames.

(g) Considercing (f) at 7 Mbps 4 bits are sent perc frame orc 20 Mbps. for ~~sychronus~~ for all 8 bits it will be 32 Mbps.