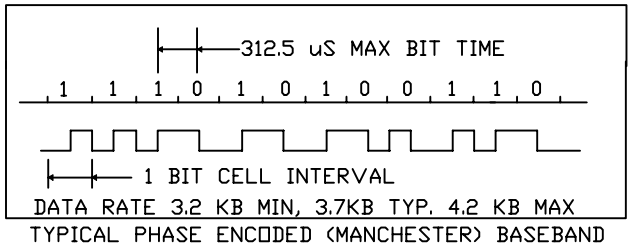
EXHIBIT 3-1 CFSDL5815

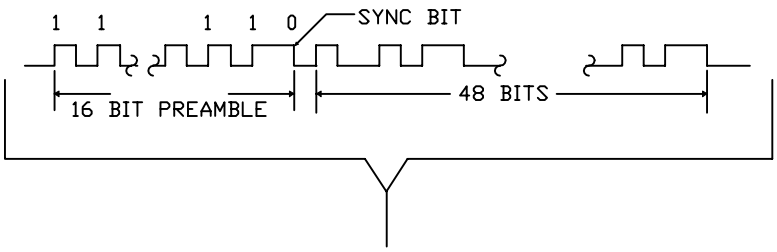
5815 Duty Cycle Calculation

Message protocol, timing and duty cycle calculation.

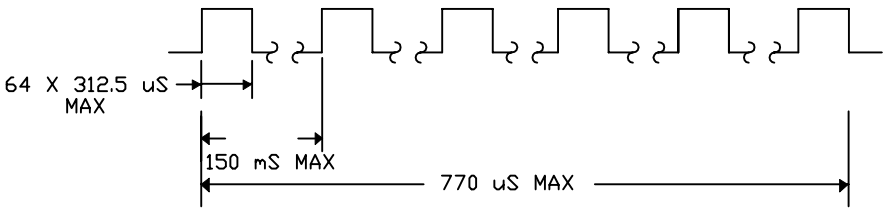
The data output is phase encoded Manchester that has inherent 50% duty cycle and consists of 64 bits per word. A supervision transmission is six identical words separated by (start to start) by nominal 125mS (100mS min. to 150mS max). Each message has a nominal data rate of 3.7 kb/s (3.2 kb/s min. to 4.2kb/s max). Therefore the duty cycle is calculated as follows:
The word format consists of 64 bits,
The duration of each bit is 312.5 uSec max.
The duty cycle over a 100 mSec measuring period is calculated as follows:
Duty cycle = Actual RF transmission ON time / 100 mSec
Actual transmission ON time = 64 bits X 50% X 312.5 uSec = 10 mSec
Therefore duty cycle = 10 / 100 mSec = 0.10 = 10%, peak to average field strength is 20 dB.
Total on-air time for a supervision transmission is:
64 X 312.5 uSec + (5 X 150 mSec) = 0.77 seconds.
In the case of an alarm transmission, the group of six transmissions is repeated twice, with the second group delayed from the first by a max. time of 2 seconds. The worst case on-air time is 2 X (supervision time) + 2 = 3.54 seconds.
Summary:- Duty cycle = 10%
On-air time = 3.54 seconds.



TYPICAL PHASE ENCODED (MANCHESTER) BASEBAND



SINGLE MESSAGE



6 IDENTICAL MESSAGES = 1 SUPERVISION MESSAGE

OR