
**EXPLANATION ON THE TABLE OF
AFTN CIRCUITS LOADING STATISTICS**

1. The Table should be completed by each AFTN COM Centre during the period of one month with daily data of the message traffic of each of the AFTN international circuits/channels that are connected to the centre. This monthly evaluation is aimed at capturing the seasonal factor of the message traffic during the year.
2. For each AFTN circuit/channel, it is required to indicate in the table the corresponding modulation rate and the line code [Baudot (ITA-2) or IA-5]. Likewise, it is required that the names with location indicators of the origin and destination stations should be also filled out in the Table header. As a relevant part and summary of the data processing, it is necessary to indicate the Transmission Average Load factor(TX) and the Reception Average Load factor(TX). The explanation of the columns in the Table is the following :

Column 1	Date of the data processed
Column 2 and 6	Number of characters in the Peak Hour
Column 3 and 7	Load Factor in the Peak Hour
Column 4 and 8	Number of characters per day
Columns 5 and 9	Daily Load Factor (as a percentage figure)

3. Loads factors could be calculated as follows:

- a) to calculate the Peak Hour Load Factor(HLF), the number of characters(NCH) of columns 2 and 6 should be divided separately by the channel effective capacity(CEC) and multiplied by 100. The result will always be lower or equal to 100 per cent :

$$\text{HLF}\% = \text{NCH} * 100 / \text{CEC}$$

Some examples of CEC are provided (for several modulation rates and line codes) in page 4A-3

- b) to calculate the Daily Load Factor (DLF) of the channel, the number of characters(NCD) of columns 4 and 8 should be divided separately by the channel effective capacity (CEC) multiplied by 24 and the result is multiplied by 100, The result will be always lower or equal to 100 per cent.

$$\text{DLF}\% = \text{NCD} * 100 / \text{CEC} * 24$$

- c) to calculate the average load factor RX or TX(cells shown in the table header), the following expression is applied :

$$\text{Lx(average)} = \frac{\text{Lx1} + \text{Lx2} + \dots + \text{Lxn}}{N}$$

where

- Lx is the average monthly occupancy
- Lx1 to Lxn are taken from the cells of columns 3 and 7
- N is the number of days of the month of evaluation

For a good performance of the AFTN, the Lx(average) should be kept lower or equal to 0.4 .

References :

- *ICAO Manual on the Planning and Engineering of the Aeronautical Fixed Telecommunication Network (Doc 8259)
- *ICAO Air Navigation Plan-MID Region (Doc 9708)
- *Report of the LIM MID RAN (Doc 9672)
- *CAR/SAM ANP and FASID

1. ITA-)

Modulation Rate	Effective Capacity (Characters/Hour)
50 bits/s	24 000
75 bits/s	36 000
100 bits/s	48 000
150 bits/s	72 000
300 bits/s	144 000

2. IA-5 Line Code, Asynchronous (1 Stop Bit)

Modulation Rate	Effective capacity 7.1 (Characters/Hour)	
	Without Protocol	CAT B Protocol(93%)*
300 bits/s	108 000	100 400
600 bits/s	216 000	200 880
1 200 bits/s	432 000	401 760
2 400 bits/s	864 000	803 520
4 800 bits/s	1 720 000	1 707 040
9 600 bits/s	3 456 000	3 214 080

3. Line Code IA-5, Synchronic

Modulation Rate	EFFECTIVE CAPACITY (Characters/Hour)	
	CAT B Protocol (93%)*	DHLC Protocol (97%)**
2 400 bits/s	1 004 400	1 047 600
4 800 bits/s	2 008 800	2 095 200
9 600 bits/s	4 017 600	4 190 400

* The effective capacity has been reduced to 93% per cent to allow the protocol header

** The effective capacity has been reduced to 97% per cent to allow the protocol header
