INTERNATIONAL TELECOMMUNICATION UNION

ITU-T F.64

TELECOMMUNICATION
STANDARDIZATION SECTOR
OF ITU

OPERATIONS AND QUALITY OF SERVICE

TELEGRAPH SERVICES

DETERMINATION OF THE NUMBER OF INTERNATIONAL TELEX CIRCUITS REQUIRED TO CARRY A GIVEN VOLUME OF TRAFFIC

ITU-T Recommendation F.64

(Extract from the *Blue Book*)

NOTES

1 ITU-T Recommendation F.64 was published in Fascicle II.4 of the *Blue Book*. This file is an extract from the *Blue Book*. While the presentation and layout of the text might be slightly different from the *Blue Book* version, the contents of the file are identical to the *Blue Book* version and copyright conditions remain unchanged (see below).

2 In this Recommendation, the expression "Administration" is used for conciseness to indicate both a telecommunication administration and a recognized operating agency.

Recommendation F.64

DETERMINATION OF THE NUMBER OF INTERNATIONAL TELEX CIRCUITS REQUIRED TO CARRY A GIVEN VOLUME OF TRAFFIC

The CCITT,

considering

(a) that it is essential to provide an adequate number of circuits between two telex networks in order to provide the rapid service stipulated in Recommendation F.60;

(b) that the use of tables for the determination of the number of circuits as a function of the traffic to be dealt with during the busy hour is an established practice in all Administrations, and is a convenient means of indicating a standard;

(c) that international telex circuits may be selected either at manual positions, or via automatic switching equipment, particularly where subscriber-to-subscriber selection is employed between two networks;

unanimously declares

(1) that Administrations should use Tables 1/F.64 or 2/F.64 below, according to the system of selection employed (i.e. manual selection or automatic selection) in the international service;

(2) Administrations should aim for full availability of circuits on intercontinental and ARQ radio routes operated with signalling in accordance with Recommendations U.1, U.11, U.12 and U.20. Where an Administration is unable to provide the full availability, it should provide an availability to achieve not less than 90% of the full availability capacity relative to the number of circuits on the route at a grade of service of one in 50.

1 Introduction

1.1 Table 1/F.64 shows values for manual traffic carried. If for the purpose of design (as distinct from the maintenance of rapid service) it is desired to obtain values for offered traffic in erlangs, these may be determined by adding the respective values of lost traffic to the figures for carried traffic in Table 1/F.64.

1.2 Table 1/F.64 is directly applicable only to full-availability groups of circuits that are operated either wholly as bothway circuits, or wholly as undirectional circuits.

1.3 Tables 2/F.64 shows values for traffic offered in the automatic service and is directly applicable to full-availability groups and groups with availabilities between 10 and 50.

Given the traffic offered (A) in erlangs and the availability (K), the number of circuits required to provide a loss probability (B) of 0.02 may be determined from. Table 2/F.64. Groups of up to 200 circuits and availabilities of 10, 20, 30, 50 and N circuits (N circuits corresponding to full availability) are covered. The method of applying the table is shown in Figure 1/F.64.

1.4 Where groups of circuits are divided into bothway and unidirectional components, the division and number of circuits in each component will be agreed between Administrations.

TABLE 1/F.64

Traffic capacity table for manually selected telex circuits (Note 1)

Number of circuits	Average intensity for traffic carried in the busy hour, expressed in erlangs, for a grade of service (probability of loss) of:		
	1 in 10 (Note 2)	1 in 30 (Note 3)	1 in 50 (Note 3)
a	*b*	*c*	*d*
1	0.2	0.066	0.034
2	0.9	0.43	0.33
3	1.5	0.89	0.76
4	2.3	1.49	1.29
5	3.2	2.17	1.92
6		2.92	2.67
7		3.77	3.44
8		4.66	4.25
9		5.56	5.09
10		6.47	5.93
11		7.39	6.79
12		8.31	7.67
13		9.24	8.57
14		10.2	9.48
15		11.1	10.4
16		12.1	11.3
17		13.0	12.3
18		13.9	13.2
19		14.9	14.1
20		15.9	15.0

Note 1 – Table 1/F.64 makes allowance for the manual operator to continue the search for a free line over the group of circuits concerned for a period of 30 seconds if all are engaged, after which the search is abandoned and the call suspended.

Note 2 – Column *b* of Table 1/F.64 will, in general, only be used in respect of small groups of circuits of considerable length, having due regard to the desire to provide a rapid service, as well as to economic considerations.

Note 3 – In all other cases the figures of column *c* shall be used in preference to those of column *d*.

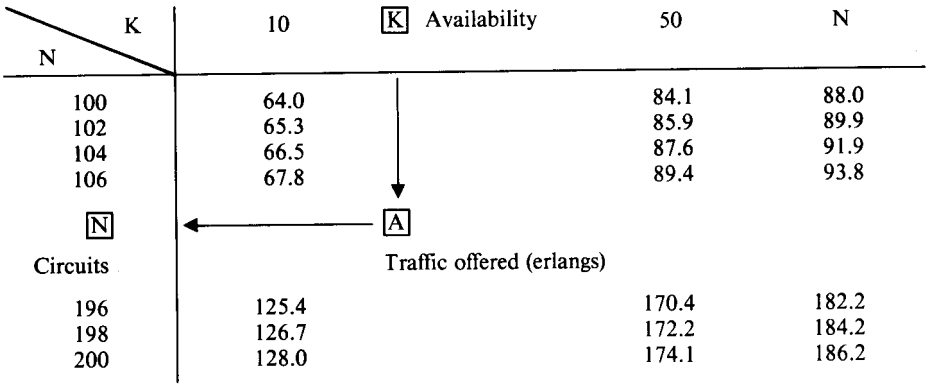

FIGURE 1/F.64

An example for using Table 2/F.64

TABLE 2/F.64

Traffic capacity table for automatic circuits

K / N	10	20	30	50	... N
	A				
1					0.02
2					0.22
3					0.60
4					1.09
5					1.66
6					2.28
7					2.94
8					3.63
9					4.34
10	5.08				5.08
11	5.68				5.84
12	6.29				6.61
13	6.90				7.40
14	7.52				8.20
15	8.15				9.01
16	8.77				9.83
17	9.40				10.7
18	10.0				11.5
19	10.7				12.3
20	11.3	13.2			13.2
21	12.0	13.9			14.0
22	12.6	14.7			14.9
23	13.3	15.4			15.8
24	13.9	16.2			16.6
25	14.6	16.9			17.5
26	15.2	17.7			18.4
27	15.9	18.4			19.3
28	16.5	19.2			20.2
29	17.2	19.9			21.0
30	17.8	20.7	21.9		21.9
31	18.5	21.5	22.7		22.8
32	19.2	22.2	23.5		23.7
33	19.8	23.0	24.3		24.6
34	20.5	23.8	25.1		25.5
35	21.1	24.6	26.0		26.4
36	21.8	25.3	26.8		27.3
37	22.5	26.1	27.6		28.3
38	23.1	26.9	28.4		29.2
39	23.8	27.7	29.2		30.1
40	24.4	28.4	30.0		31.0
41	25.1	29.2	30.8		31.9
42	25.8	30.0	31.7		32.8
43	26.4	30.8	32.5		33.8
44	27.1	31.6	33.3		34.7
45	27.8	32.3	34.1		35.6
46	28.4	33.1	34.9		36.5
47	29.1	33.9	35.8		37.5
48	29.8	34.7	36.6		38.4
49	30.4	35.5	37.4		39.3
50	31.1	36.3	38.2	40.3	40.3

TABLE 2/F.64

(cont'd)

K / N		10	20	30	50	... N
	A					
50		31.1	36.3	38.2	40.3	40.3
51		31.8	37.1	39.1	41.1	41.2
52		32.4	37.9	39.9	42.0	42.1
53		33.1	38.7	40.7	42.8	43.1
54		33.8	39.4	41.6	43.7	44.0
55		34.4	40.2	42.4	44.6	44.9
56		35.1	41.0	43.2	45.4	45.9
57		35.7	41.8	44.1	46.3	46.8
58		36.4	42.6	44.9	47.2	47.8
59		37.1	43.4	45.7	48.0	48.7
60		37.7	44.2	46.6	48.9	49.6
61		38.4	45.0	47.4	49.8	50.6
62		39.1	45.8	48.2	50.6	51.5
63		39.7	46.6	49.1	51.5	52.5
64		40.4	47.4	49.9	52.4	53.4
65		41.0	48.2	50.8	53.3	54.4
66		41.7	49.0	51.6	54.1	55.3
67		42.4	49.8	52.4	55.0	56.3
68		43.0	50.6	53.3	55.9	57.2
69		43.7	51.4	54.1	56.7	58.2
70		44.4	52.2	55.0	57.6	59.1
71		45.0	53.0	55.8	58.5	60.1
72		45.7	53.8	56.6	59.4	61.0
73		46.3	54.6	57.5	60.2	62.0
74		47.0	55.4	58.3	61.1	62.9
75		47.6	56.2	59.2	62.0	63.9
76		48.3	57.0	60.0	62.9	64.9
77		49.0	57.8	60.9	63.8	65.8
78		49.6	58.6	61.7	64.6	66.8
79		50.3	59.4	62.6	65.5	67.7
80		50.9	60.2	63.4	66.4	68.7
81		51.6	61.0	64.3	67.3	69.6
82		52.2	61.8	65.1	68.2	70.6
83		52.9	62.6	66.0	69.0	71.6
84		53.6	63.4	66.8	69.9	72.5
85		54.2	64.2	67.6	70.8	73.5
86		54.9	65.0	68.5	71.7	74.5
87		55.5	65.9	69.3	72.6	75.4
88		56.2	66.7	70.2	73.5	76.4
89		56.8	67.5	71.0	74.3	77.3
90		57.5	68.3	71.9	75.2	78.3
91		58.1	69.1	72.7	76.1	79.3
92		58.8	69.9	73.6	77.0	80.2
93		59.4	70.7	74.4	77.9	81.2
94		60.1	71.5	75.3	78.8	82.2
95		60.7	72.3	76.2	79.7	83.1
96		61.4	73.1	77.0	80.5	84.1
97		62.0	73.9	77.9	81.4	85.1
98		62.7	74.7	78.7	82.3	86.0
99		63.3	75.5	79.6	83.2	87.0
100		64.0	76.3	80.4	84.1	88.0

TABLE 2/F.64

(concluded)

K / N		10	20	30	50	... N
100	A	64.0	76.3	80.4	84.1	88.0
102		65.3	77.9	82.1	85.9	89.9
104		66.5	79.6	83.8	87.6	91.9
106		67.8	81.2	85.5	89.4	93.8
108		69.1	82.8	87.3	91.2	95.7
110		70.4	84.4	89.0	93.0	97.7
112		71.7	86.0	90.7	94.8	99.6
114		72.9	87.6	92.4	96.6	101.6
116		74.2	89.3	94.1	98.3	103.5
118		75.5	90.9	95.8	100.1	105.5
120		76.8	92.5	97.5	101.9	107.4
122		78.1	94.1	99.3	103.7	109.4
124		79.3	85.7	101.0	105.5	111.3
126		80.6	97.3	102.7	107.3	113.3
128		81.9	99.0	104.4	109.1	115.2
130		83.2	100.6	106.1	110.9	117.2
132		84.5	102.2	107.9	112.7	119.1
134		85.7	103.8	109.6	114.5	121.1
136		87.0	105.4	111.3	116.3	123.1
138		88.3	107.0	113.0	118.1	125.0
140		89.6	108.7	114.7	119.9	127.0
142		90.8	110.3	116.5	121.7	128.9
144		92.1	111.9	118.2	123.5	130.9
146		93.4	113.5	119.9	125.3	132.9
148		94.7	115.1	121.6	127.1	134.8
150		96.0	116.7	123.4	128.9	136.8
152		97.2	118.3	125.1	130.7	138.8
154		98.5	120.0	126.8	132.5	140.7
156		99.8	121.6	128.5	134.3	142.7
158		101.1	123.2	130.3	136.1	144.7
160		102.4	124.8	132.0	137.9	146.6
162		103.6	126.4	133.7	139.7	148.6
164		104.9	128.0	135.4	141.5	150.6
166		106.2	129.6	137.2	143.3	152.6
168		107.5	131.2	138.9	145.1	154.5
170		108.8	132.9	140.6	146.9	156.5
172		110.0	134.5	142.3	148.7	158.5
174		111.3	136.1	144.1	150.5	160.4
176		112.6	137.7	145.8	152.3	162.4
178		113.9	139.3	147.5	154.1	164.4
180		115.2	140.9	149.2	155.9	166.4
182		116.4	142.5	151.0	157.7	168.3
184		117.7	144.1	152.7	159.6	170.3
186		119.0	145.7	154.4	161.4	172.3
188		120.3	147.3	156.2	163.2	174.3
190		121.6	148.9	157.9	165.0	176.3
192		122.8	150.6	159.6	166.8	178.2
194		124.1	152.2	161.3	168.6	180.2
196		125.4	153.8	163.1	170.4	182.2
198		126.7	155.4	164.8	172.2	184.2
200		128.0	157.0	166.5	174.1	186.2