Guidelines for the Blood Transfusion Services

Annexe 2: ISBT 128 check character calculation

http://www.transfusionguidelines.org/red-book/annex-2-isbt-128-check-character-calculation

Annexe 2:

ISBT 128 check character calculation

ISBT 128 donation numbers utilise check characters based on the ISO 7064 modulus 37,2 algorithm. This Annex shows how to calculate the check character for a given number. The calculation is based on the donation number string excluding the leading '=' symbol and the flag characters.

The steps in the process are as follows:

1. For each character in the string determine its check value as required by ISO 7064 (see Table A2.1).

2. For each character determine its weighted check value by multiplying the check value from (1) by the nth power of 2 where n is the position of the character from the right-hand end of the string.

3. Sum the weighted check values from (2).

4. Find the modulus 37 value of the sum from (3).

5. Subtract the value obtained in (4) from 38.

6. Find the modulus 37 value of the result of (5). This is the 37,2 checksum.

The calculated checksum is used to generate both the barcode check characters used in the flag positions of the ISBT 128 barcode and the eye-readable check character. The barcode check characters are determined by adding 60 to the checksum. The eye-readable check character is determined by cross-referencing the checksum to Table A2.1.

Table A2.1 Mapping from characters to ISO 7064 check values

Char	0	1	2	3	4	5	6	7	8	9	A	B	C	D
Value	0	1	2	3	4	5	6	7	8	9	10	11	12	13
Char	E	F	G	H	I	J	K	L	M	N	O	P	Q	R
Value	14	15	16	17	18	19	20	21	22	23	24	25	26	27
Char	S	T	U	V	W	X	Y	Z	*					
Value	28	29	30	31	32	33	34	35	36					

Table A2.2 Example of displayed numbers

Donation number G123 498 654 321				
Position from right (n)	2n	Character	ISO7064 value (step 1)	Weighted value (step 2)
13	8192	G	16	131072
12	4096	1	1	4096
11	2048	2	2	4096
10	1024	3	3	3072
9	512	4	4	2048
8	256	9	9	2304
7	128	8	8	1024
6	64	6	6	384

5	32	5	5	160
4	16	4	4	64
3	8	3	3	24
2	4	2	2	8
1	2	1	1	2
Step 3	Sum of weighted values			148354
Step 4	Sum mod 37			21
Step 5	Subtract from 38			17
Step 6	Mod 37			17
ISO 37,2 checksum =				17
ISBT128 barcode check characters				77
ISBT128 eye-readable check =				H