

IRU Requirements for the conformity control of Check Characters

The following are the requirements for the printing of TIR Carnets in order to facilitate a mathematical calculation of the carnet check characters for easy integration into existing computer systems.

The characters on the first (outer) wheel run, in order, 'R', 'U', 'X', 'A', 'D', 'G', 'J', 'M', 'P', 'S', 'V', 'Y' with the "null" character being 'X'.

The characters on the second (inner) wheel run, in order, 'B', 'E', 'H', 'K', 'N', 'Q', 'T', 'W', 'Z', 'C', 'F' with the "null" character again being 'X'.

The characters 'I', 'L' and 'O' are never used.

This produces the following values (where MOD is the result of calculating the carnet number *modulus* 23).

MOD	CHARS	MOD	CHARS	MOD	CHARS	MOD	CHARS
0	RX	1	UX	2	XX	3	AX
4	DX	5	GX	6	JX	7	MX
8	PX	9	SX	10	VX	11	YX
12	XB	13	XE	14	XH	15	XK
16	XN	17	XQ	18	XT	19	XW
20	XZ	21	XC	22	XF		

Table 1 Check Characters

The following table shows a sequence of carnet "numbers" starting at the (mythical) number 25 million.

XB 25 000 000	XE 25 000 001	XH 25 000 002	XK 25 000 003
XN 25 000 004	XQ 25 000 005	XT 25 000 006	XW 25 000 007
XZ 25 000 008	XC 25 000 009	XF 25 000 010	RX 25 000 011
UX 25 000 012	XX 25 000 013	AX 25 000 014	DX 25 000 015
GX 25 000 016	JX 25 000 017	MX 25 000 018	PX 25 000 019
SX 25 000 020	VX 25 000 021	YX 25 000 022	XB 25 000 023
XE 25 000 024	XH 25 000 025	XK 25 000 026	XN 25 000 027
XQ 25 000 028	XT 25 000 029	XW 25 000 030	XZ 25 000 031

Table 2 Examples of the numbering sequence

The following sample routine computes a two-character string from a supplied carnet number:

```
TYPE
    TXP$Check_Chars = VARYING [2] OF CHAR;

FUNCTION GF0$_Carnet_Check_Char ( Carnet_Number : INTEGER ) : TXP$Check_Chars;
VAR
    Carnet_Modulo_23,
    Check_Letter          : INTEGER;
BEGIN
    IF ( Carnet_Number < 25000000 )
    THEN
        GF0$_Carnet_Check_Char := '';
    ELSE
        BEGIN
            Carnet_Modulo_23 := Carnet_Number MOD 23;

            Check_Letter := ORD ( "A" ) + ( 3 * Carnet_Modulo_23 + 17 ) MOD 26;

            IF ( Carnet_Modulo_23 < 12 )
            THEN
                GF0$_Carnet_Check_Char := CHR ( Check_Letter ) + "X"
            ELSE
                GF0$_Carnet_Check_Char := "X" + CHR ( Check_Letter );
        END;
    END;
END;
```