SMPTE RECOMMENDED PRACTICE

RP 135-2004
Revision of RP 135-1999

Use of Binary User Groups in Motion-Picture Time and Control Codes

1 Scope

This practice specifies a method of coding data into the binary user groups of time and control codes for motion-picture systems. The type of data recorded is useful in the production of motion pictures.

This practice also specifies a directory system to accommodate the various types of data that may need to be recorded. Whether or not to use a particular type of data (and, if used, the repetition frequency) is left to the discretion of the equipment manufacturer and/or the user.

This practice also specifies the use of a checksum in one of the binary user groups.

2 Normative reference

The following standard contains provisions which, through reference in this text, constitute provisions of this practice. At the time of publication, the edition indicated was valid. All standards are subject to revision, and parties to agreements based on this practice are encouraged to investigate the possibility of applying the most recent edition of the standard indicated below.

SMPTE RP 136-2004, Time and Control Codes for 24, 25 or 30 Frame-Per-Second Motion-Picture Systems

3 Binary group flag bits

When the data format corresponding to this practice is used, the binary group flag bits specified in SMPTE RP 136 shall be set as follows:

> Bit 43 of the type C code or bit 67 of the type B code shall be set to a zero. Bit 59 of the type C code or bit 83 of the type B code shall be set to a one.

4 Data structure

4.1 There are 8 binary groups specified in SMPTE RP 136, each consisting of four bits. Unless otherwise specified, when a group of these bits is used to represent a number of characters, the bit with the lowest number specified in SMPTE RP 136 shall be the least significant bit, and the unit with the highest number shall be the most significant bit.

4.2 The first binary group shall be used as a data identification index, identifying the data in the second through seventh binary groups as specified below, and as shown in table 1. There are 16 possible index values, numbered 0 through 15. Each frame of time and control code may thus contain only one type of data, depending on the value of the data identification index. A sequence or more than one frame may be required, therefore, to record all the required data. However, the choice of which data types to use (and their repetition frequency) is left to the discretion of the user and/or manufacturer.

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Table 1 – Directory

Index	Data	Digits	Format
0	Flags	24	Binary
1	Date (DDMMYY)	6	BCD
2	Production number	6	BCD
3	Equipment identification	4	6-BIT CHAR
4	Scene number	4	6-BIT CHAR
5	Take number	4	6-BIT CHAR
6	Roll number	4	6-BIT CHAR
7 – 14	Unassigned		
15	Extended directory		

4.3 The eighth binary group shall be used as a checksum. It shall contain the negative of the modulo-16 sum of the first through seventh binary groups.

4.4 Directory

4.4.1 Entry 0

When the value of the data identification index is zero, the bits of the second through seventh binary groups shall be used as individual flags as described in table 2. Flag bits that are not used or that are unassigned should be set to zero.

Table 2 – Flags

Bit No. type C	Bit No. type B	Data	
		Zero	One
12	36	Pictures	Audio
13	37	Sync sound or picture	No sound / no picture
14	38	To be printed	Not printed
15	39	Sync speed	Not sync speed
20	44	Day photography	Night photography
21	45	Daylight	Tungsten

4.4.2 Entry 1

When the value of the data identification index is one, the bits of the second through seventh binary groups shall be used to record the date in binary coded decimal format. The binary groups shall be assigned as follows:

Binary group	Contents
Second	Units of the day of the month
Third	Tens of the day of the month
Fourth	Units of the month
Fifth	Tens of the month
Sixth	Units of the year
Seventh	Tens of the year

The date will be displayed in increasing quantities of time: day, month, year.

4.4.3 Entry 2

When the value of the data identification index is two, the bits of the second through seventh binary groups shall be used to record a production identification number or code in binary coded decimal format.

4.4.4 Entry 3

When the value of the data identification index is three, the bits of the second through seventh binary groups shall be used to record a four-digit equipment identification number or code. For example, if more than one camera is used, the camera number could be recorded. This code may be alphanumeric and shall be recorded with the 6-bit character set described in clause 5. Any of the character symbols may also be used.

4.4.5 Entry 4

When the value of the data identification index is four, the bits of the second through seventh binary groups shall be used to record a four-digit scene number. This number may be alphanumeric and shall be recorded with the 6-bit character set described in clause 5. Any of the character symbols may also be used.

4.4.6 Entry 5

When the value of the data identification index is five, the bits of the second through seventh binary groups shall be used to record a four-digit take number. This number may be alphanumeric and shall be recorded with the 6-bit character set described in clause 5. Any of the character symbols may also be used.

4.4.7 Entry 6

When the value of the data identification index is six, the bits of the second through seventh binary groups shall be used to record a four-digit roll number. For example, when recording sound, this number could identify the roll of magnetic tape, or when shooting pictures, this roll could identify the roll of film. This number may be alphanumeric and shall be recorded with the 6-bit character set described in clause 5. Any of the character symbols may also be used.

4.4.8 Entries 7 through 14

These index values are unassigned and shall not be used. Their assignment is reserved to the SMPTE.

4.4.9 Entry 15

When the value of the data identification index is 15, an extended directory is invoked. The second binary group becomes an extended data identification index and data is recorded in the third through seventh binary groups. No extended data identification values are assigned at this time and their assignment in the future is reserved to the SMPTE. Until they are assigned, a data indication index of 15 shall not be used.

5 Six-bit character format

5.1 Certain types of data are recorded using a six-bit character set. This section specifies the allocation of the four-bit user groups when recording this type of data and the character set to be used.

5.1.1 Use of the bits

The data bits of the second through seventh binary groups shall be assigned as specified in table 3.

5.1.2 Character set

The character set shall be as defined in table 4. This character set is a subset of the one defined in ISO 2022.

Table 3 – Data bit assignment

Bits, type C code	Bits, type B code	Use
12, 13, 14, 15, 20, 21	36, 37, 38, 39, 44, 45	Least significant character
22, 23, 28, 29, 30, 31	46, 47, 52, 53, 54, 55	Character
36, 37, 38, 39, 44, 45	60, 61, 62, 63, 68, 69	Character
46, 47, 52, 53, 54, 55	70, 71, 76, 77, 78, 79	Most significant character

Table 4 – Six-bit character set

Character	Binary equivalent	Decimal equivalent	Character	Binary equivalent	Decimal equivalent
space	000000	0	@	100000	32
!	000001	1	A	100001	33
"	000010	2	B	100010	34
#	000011	3	C	100011	35
$	000100	4	D	100100	36
%	000101	5	E	100101	37
&	000110	6	F	100110	38
'	000111	7	G	100111	39
(	001000	8	H	101000	40
)	001001	9	I	101001	41
*	001010	10	J	101010	42
+	001011	11	K	101011	43
,	001100	12	L	101100	44
-	001101	13	M	101101	45
.	001110	14	N	101110	46
/	001111	15	O	101111	47
0	010000	16	P	110000	48
1	010001	17	Q	110001	49
2	010010	18	R	110010	50
3	010011	19	S	110011	51
4	010100	20	T	110100	52
5	010101	21	U	110101	53
6	010110	22	V	110110	54
7	010111	23	W	110111	55
8	011000	24	X	111000	56
9	011001	25	Y	111001	57
:	011010	26	Z	111010	58
;	011011	27	[	111011	59
<	011100	28	\	111100	60
=	011101	29	]	111101	61
>	011110	30	^	111110	62
?	011111	31	_	111111	63

Annex A (informative)
Bibliography

ISO/IEC 2022:1994, Information Technology – Character Code Structure and Extension Techniques