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SMPTE RECOMMENDED PRACTICE**RP 156-1999**

Revision of RP 156-1995

Bar Code Labeling for Type D-1 Component and Type D-2 Composite Cassette Identification



Page 1 of 8 pages

1 Scope

This practice describes the requirements for the generation of bar code labels for the automatic identification of type D-1 component and type D-2 composite cassettes. Dimensions and tolerances of the printed bar code symbols are specified. The symbol encoding, data structure, and formatting of the label information are also specified. Lastly, the label characteristics, size, orientation, and placement are specified. This practice includes both rear and side labels.

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.

ANSI/SMPTE 226M-1996, Television Digital Recording — 19-mm Tape Cassettes

3 Bar code symbology

The interleaved 2 of 5 bar code shall be the symbology used for the identification of type D-1 and type D-2 cassettes.

3.1 General description

The interleaved 2 of 5 bar code is a bidirectional, self checking, numerical bar code. Different start and stop characters are employed to permit bidirectional

decoding. This bar code is a two-level code and employs a combination of wide and narrow elements to represent each symbol. The elements may be either bars or spaces. Wide elements are assigned a value of 1 and narrow elements a value of 0.

The characters are interleaved using bars to encode symbols in the odd data positions and spaces to encode symbols in the even positions. The position numbering of the symbols begins with the first character after the start character (data 0). The interleaving process always requires an even number of characters. For example, if an odd number of characters must be encoded, a leading 0 shall be used to change the number of characters to an even number (as shown in figure 1).

3.2 Code configuration

Each symbol is comprised of five elements, two of which are wide and three narrow. Table 1 shows the code symbology for characters 0 through 9.

Table 1 – Interleaved 2 of 5 bar code symbology

Character	Code
0	00110
1	10001
2	01001
3	11000
4	00101
5	10100
6	01100
7	00011
8	10010
9	01010

The start and stop characters are encoded as follows (see figure 1):

- start character 0000;
- stop character 100.

The start character is constituted by two narrow bars and two narrow spaces. The stop character is constituted by one wide bar, one narrow space, and one narrow bar.

The start character is at the normal left-hand end adjacent to the most significant character. The stop character is at the normal right-hand end adjacent to the least significant character.

The interleaved 2 of 5 bar code is continuous because there are no intercharacter gaps; all spaces contain information. Figures 1 and 2 show examples of encoded data.

3.3 Alphanumeric data

For rear labels, mixed use of alpha characters, numerics, and symbols shall be permitted in fields defined as alphanumeric. These characters are encoded using a pair of numeric symbols. Symbol encoding is shown in table 2. Encoding for alphanumeric characters may be calculated from the standard ASCII value according to the formula shown below.

Conversion from ASCII to the required format may be accomplished by subtracting 20_{hex} from the hexadecimal ASCII code and then converting the result to base 10.

Required form = { [ASCII]_{hex} – [20]_{hex} }₁₀

Refer to ANSI X3.4 for details concerning ASCII encoding. Table 2 defines alphanumeric characters

that may be used for cassette bar code labels. An example of alpha encoding is as follows:

To encode the letter A

ASCII 41_{hex}
 – 20_{hex}
 —————
 21_{hex} = 33₁₀

The position of alphanumeric data is defined by the label format.

Alphanumeric data shall be encoded, decoded, or both only in fields defined as alphanumeric.

3.4 Code density and dimensions

The significant parameters of the interleaved 2 of 5 code are the width of the narrow elements and the ratio of the width of wide to narrow elements. For optimum automatic scanning, the bar height (see table 3), the code's position on the label, and the label's orientation on the cassette shall be specified (see 4.2 and 4.3, 5.1.1 and 5.1.2, 5.2.1 and 5.2.2).

The width of a narrow element shall be 0.26 mm for rear labels and 0.68 mm for side labels. The minimum and maximum width of an element is determined by the application and constraints imposed by the specific scanning equipment. This application requires the symbols to be printed in accordance with the ratios and tolerances specified in table 3.

The ratio of the width of the wide elements to that of the narrow elements shall be 2.5:1.

The width of the various elements and the nominal ratio of the width of the wide to narrow elements shall not change within a given bar code label.

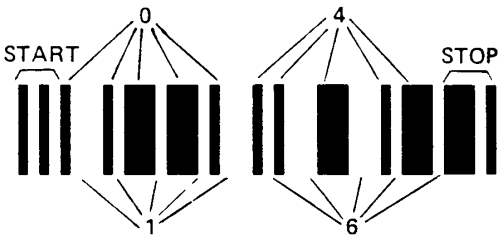


Figure 1 – Interleaved 2 of 5 bar code symbol
Encoding 0146

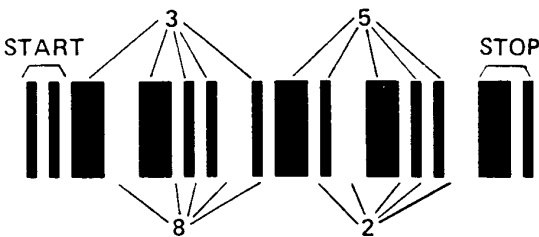


Figure 2 – Interleaved 2 of 5 bar code symbol
Encoding 3852