The International Broadcasters Tape Numbering (IBTN) Scheme

By Peter Marshall

Broadcasting throughout the world relies increasingly on the exchange of videotape programming, both in post-production and in sales distribution. All but the smallest facilities number their videotapes to ensure reliable tape location and, increasingly, tape movements are tracked using bar codes and bar code readers. Until now, there has been no large-scale attempt at standardization, and massive waste occurs in relabeling and rekeying program and technical details into successive computer systems.

The IBTN videotape numbering scheme, developed by the European Broadcasting Union (EBU), offers production houses the facility of generating numbers and bar codes that are unique on an international basis and which can be read by all other users around the world. To make it easy for companies to adopt the scheme, IBTN builds on a flexible "core" number, which is intended to accommodate all existing user numbering schemes. Building on the foundation of the IBTN number, it is proposed to define a data format to permit the interchange of a wide range of program and recording details.

Do you take tapes from another facility? Do you stick your own labels on it? Do you key client, program, and recording details into your computer library data base? If you could point a bar-code gun at the tape when it first arrives and have all you need to know about it in your computer instantly, how much time would that save your library staff in a year?

Members of the EBU's G2 (Recording) Committee believed that savings could be very significant. We were not put off by people who said, "Great idea, but people who have their own systems won't use it." As a first step, we have devised a system of numbering and bar coding that is easy to migrate to from your existing system and which can be used on a worldwide basis. We call it the International Broadcasters Tape Numbering (IBTN) scheme.

IBTN is like your phone number. Your existing scheme is your number, and IBTN adds the dial code that ensures your number to be unique and recognizable across the world. In addition, IBTN has the option of labeling the videotape format and the running time of the unrecorded tape. By design, the IBTN number does not in itself tell you anything about the recording that may be on the tape — that is to follow later. When it has been defined, it will not tell you something about the recording; it will tell you everything. Information about the client, the program, and a full history of the post-production will be there. All of this information will have been keyed in only once by the facilities that have handled the tape in turn, and the full story assembled by reading and updating a floppy disk that travels with the tape, or an information exchange using electronic data interchange (EDI), or perhaps a two-dimensional bar code.

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The Basic Number

The IBTN number consists of the following elements:

- A two-character ISO defined code for the country of origin.
- A three-letter code defining the originating company. (It should prove possible to adopt existing ITS codes within the scheme.) Used with the preceding country code, the facility code needs only to be unique within the country, thus avoiding the need for registration at an international level and permitting the repeated use of codes in different countries for companies with multinational operations.
- A nine-digit alphanumeric "core" number. This form has been set to allow all known existing tape number schemes to be accommodated within the IBTN so as to allow easy adoption of the scheme without mass renumbering of existing tapes.

To this, an optional extension may be added, consisting of the following:

- A three-character code identifying the videotape format and cassette size.
- A three-digit number giving the run time in minutes of the unrecorded tape.

Structure of the Bar Code

It was considered essential that the IBTN scheme adopt a bar-coding standard that was internationally recognized. After much debate, it was decided to adopt the EAN Code 128 scheme. Code 128 is a bar-code symbology that can encode the entire 128 ASCII character set. It has three different code sets, one of which enables numeric data to be encoded in a very compact form. In the EAN symbology, *Application Identifiers* are defined that describe the type of bar code being read. Thus, it is possible to identify IBTN bar codes from others in the same area. For example, shelf locations would have a different application identifier to that used in the IBTN number. Bar codes conforming to EAN standards are distinguished from any other bar code using Code 128 by an initial Function Code 1 character in the bar code.

Two application identifiers are used in the IBTN scheme. AI 21 is defined by the EAN for a unique *serial number* and may be up to 14 characters in length. The optional coding of the media format and the maximum recording time of the blank stock, where appropriate, is signified by a preceding

Table 1 — Typical Format Codes

Code	Format and Size
BMS	Beta SP small
D2L	D-2 large
BDL	Digi Beta large
D1L	D-1 large
D5M	D-5 medium
F35	35mm picture
35T	35mm track

AI 240, which is defined to describe *Additional Product Information.*

By separating the bar code into two parts in this way, it is possible to use preprinted bar codes if required, which may be of benefit to smaller facilities. It also means that the bar code can be reduced in length where the core number does not use the full nine digits allowed, making it suitable for small cassettes, such as DVC-format tapes.

The Second (Optional) Symbol

As just described, a second bar code symbol allows for the encoding of tape format, spool or cassette size, and the recording time of the blank tape. This may be combined with the number bar code or separated, if the cassette size imposes constraints or if it is desired to use preprinted labels. The format code (format and size) may be used alone, omitting the length, but the option of recording length without format code is not permitted. Some typical format codes are shown in Table 1.

The IBTN scheme is also intended to cover audio and data recording media associated with broadcast tapes and a wide range of applications for coding are currently being considered. Lastly, the duration in minutes of the unrecorded media, recorded as a three-digit number, may be added to the format code (e.g., D3S 020).

The IBTN Label

The IBTN standard defines the preferred characteristics of the label to ensure trouble-free use during program exchange. A sample label is shown in Fig. 1 (label A).

The IBTN should be represented in eye-readable form in a prominent manner to enable easy identification and manual selection of the broadcast tape when stacked on library shelving. The preferred position for the label is on the short side of a cassette, so as to maximize shelf packing density. Because the tape number label carries no program information, videotape cassettes can be labeled as blank stock, thus facilitating stock control.

Program and Recording Details

The EBU has also made recommendations on the program and recording details that should be shipped with the videotape to facilitate the exchange of programs. The information is divided between a *program label,* carrying information essential to the handling of the tape, and a *record report,* which includes details of aspect ratio, track usage, timings, and other information that is necessary for the correct line-up and replay of the program. A sample label is shown in Fig. 1 (label B).

The record report (Fig. 2) incorporates the details of the progam and recording that EBU members thought were necessary to know when exchanging program materials. It has been designed to fit into a typical small cassette box (Betacam) with a single fold, thus avoiding the common problem of a multiple-folded, letter-sized record report forcing the box open at an inconvenient moment.

It is a sad fact that distributors sometimes remove the facility's record report in case there are any critical comments. (This actually increases the possibility of rejection, since the recipient does not know whether a defect has crept in during distribution or whether it is unavoidable.) The use of standardized labels and record reports should help establish good practices in this area.

Administration of the IBTN Scheme

The IBTN scheme is a living system that will require maintenance in terms of the licensing of facility codes, dealing with new formats, and extensions to

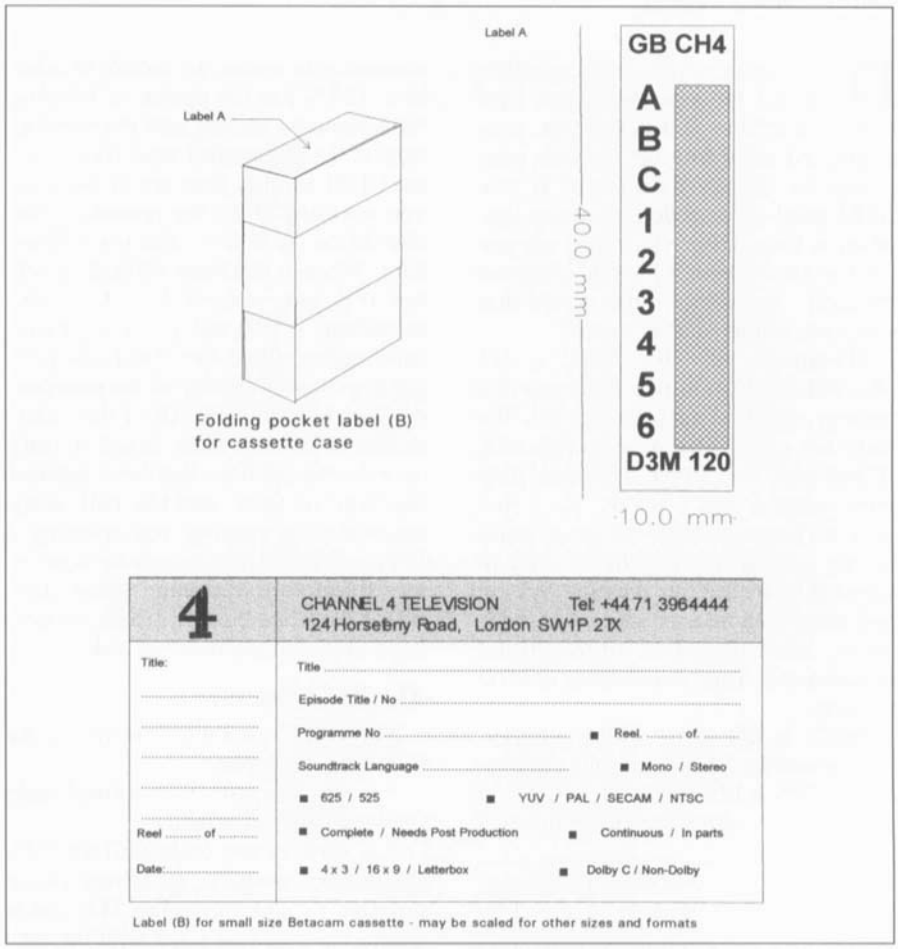

Figure 1. Sample label for program exchange.

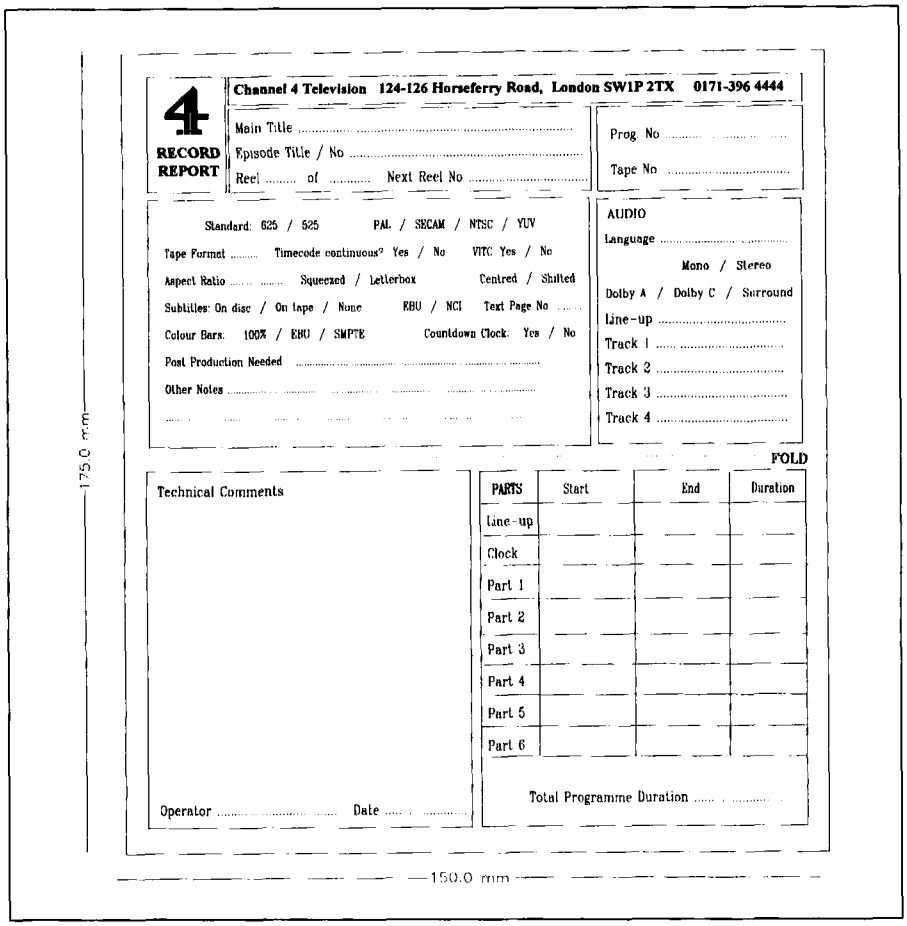

Figure 2. Typical record report conforming to EBU standard.

the scheme. The EBU has accepted the role of international coordination as well as administration of the scheme throughout its territories.

The author suggests that the SMPTE would be ideally suited to undertake this role in North America. It would be expected that the cost of administration would be covered by charges for licensing new facilities, and by the sale of the IBTN Standard and Guide to Implementation.[1]

Further Work

It is recognized that the IBTN number is in itself only a modest start into a much more exciting area for development, that of exchanging full program and recording details electronically. Implementation of the IBTN scheme is a necessary foundation to that development.

Conceptually, the IBTN Group considers that a floppy disk should be attached to the videotape container and used to input to the recipient's library system the required program and recording details, post-production history, company contacts, etc. Each piece of information would be preceded by a standardized header that would define the type and format of the information following. The recipient's computer systems would read the contents of the disk, discarding information that was not required (details of operations carried out while in the facility's care being appended to the disk before subsequent dispatch).

Clearly, the use of a floppy disk for this task is only one option, and the working group intends to investigate other forms of exchange, including two-dimensional bar codes and EDI.

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Committee

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Endnote

1. Copies of the IBTN Standard may be obtained from EBU Technical Centre, Case Postale 67, CH1218 Grand-Saconnex (GE), Switzerland.

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Peter Marshall is assistant chief engineer, Channel 4 Television in London. His career spans 30 years, starting with the BBC before moving to the Independent Broadcasting Authority, where he held a variety of posts concerned with the setting and administration of codes of technical practice for commercial television companies in the U.K. Since moving to Channel 4 in 1988, Marshall has been responsible for station operations and has taken a special involvement in liaison with program makers on technical developments including component digital working and widescreen. He chairs the EBU task force on international broadcast videotape numbering, which work he describes in this paper.