

# CUSTOMER BAR CODING TECHNICAL WORKING GROUP

## Minutes of the Meeting held on 17 March 2004

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### Participants:

<i>Belgian Post Group</i>	Yves Remy
<i>Domino</i>	David Bance
<i>Finland Post</i>	Juha Nurmi
<i>IPC</i>	John Wells
<i>Pitney Bowes</i>	Leon Pintsov
<i>Solystic</i>	Christophe Caillon, François Gillet
<i>USPS</i>	Kuldip Goyal, Himesh Patel

### Apologies for Absence:

<i>Australia Post</i>	Chris Reynolds
<i>Correios de Portugal</i>	José Coutinho
<i>Japan Post</i>	Hideo Uchida
<i>Siemens Dematic</i>	Jürgen Schad
<i>USPS</i>	George Coupar, Ed Kuebert

### Documents

- A. UPU CBC WG: Agenda and arrangements for the meeting of 17 March 2004 *ipc-jw15242 (email of 040220)*
- B. Minutes of the customer bar coding work group meeting of 17 December 2003 *ipc-jw15270 (email of 040310)*
- C. IPC presentation for the meeting *ipc-jw15248*
- D. Presentation on DOTE code *ipc-jw15109*
- E. CBC WG: Partially updated draft for discussion on 17 December [includes S(cbc)-1 Draft D] *email of 031212*

## 1 Introductions and agreement of the agenda

- 1.1.1 Those present introduced themselves and apologies were noted.
- 1.1.2 The agenda proposed by IPC (Doc C, slide 1) was agreed.

## 2 Minutes of previous meetings

- 2.1.1 The minutes of the meeting of 17 December (Doc B) had been circulated late (10 March) by IPC and, as a result, had not been seen by L Pintsov or Y Remy. It was agreed to approve them subject to eventual corrections by these two participants. 1 *pib,lp*  
1 *bea,yr*

## 3 Review of actions

- 3.1.1 Open actions were reviewed, the results being reflected in the attached annexes of open and completed actions.
- 3.1.2 With respect to actions 14309#2, 14716#1 and 15270#10, L Pintsov noted that he had sent a contribution during January. IPC had temporarily misplaced this as a result of J Wells' PC failure, but found it back during the meeting. J Wells apologised for the oversight and promised to circulate the contribution to the working group [Done] before working it into the draft. 2 *ipc,jlw*

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- 3.1.3 On action 15270#1, J Schad has reported to IPC that, on all recently installed systems, bar code readers and OCR/bar code reading software have the technical capability to support Code 128 in addition to eventual support of Code 39. Hence, operational support of Code 128 would require only 'reconfiguration', not equipment modifications or the development of new software.
- 3.1.4 The Solystic presentation on DOTE code (action 15270#4 and #5) had been circulated as ipc-jw15109. It was noted that DOTE is not the only symbology of this type. In particular, the same inventor had developed ECO code, details of which may be found on <http://perso.wanadoo.fr/ecosys-int/index.htm>. A clothes label containing a machine stitched ECO code example was circulated as an example.
- 3.1.5 Due to late circulation of the minutes of the last meeting, only IPC had raised questions about DOTE (actions 15270#3 and #6). Therefore there had been no reason to invite the DOTE author (15270#7). It was agreed to keep these actions open until the next meeting. In the meantime, IPC will circulate its questions and the responses received.

3 ipc,jlw

## 4 USPS intelligent mail programme

- 4.1.1 It had been planned that Ed Kuebert would provide a presentation on USPS' intelligent mail programme, but he had finally been unable to attend the meeting. In his absence, IPC gave a short presentation on its understanding of the status, derived from a visit to USPS in early March (see doc C, slides 8-15). The presentation was divided into three parts, covering letters, parcels and implications for the CBC standard.

### 4.2 Letter mail proposals

- 4.2.1 On letters, it was reported (slides 8-10) that USPS had concluded that, whilst a long term solution should be sought using 2-dimensional symbologies such as Data matrix or PDF417, the introduction of these would be premature for many mailers. It had therefore decided to work towards short term implementation of a 4-state customer bar code, printed at an allowed pitch of 1,0 to 1,2 mm and limited in length to 79 mm (3,1"). This needs to accommodate a customer assigned identifier consisting of a customer ID and customer assigned item number, a service code and item destination information. Provision had also been made for a format indicator. Allowing for the currently anticipated lengths of the various sub-fields (see slide 8), this results in 103 data bits. Current plans call for 27 error correction bits, resulting in a 130 bit, or 65 bar, code. It is not yet known whether this will result in the required read rate, of the order of 99,5%.
- 4.2.2 IPC has advised USPS (slide 9) that it sees a number of significant problems with the current proposals. They appear to represent a US-domestic view of requirements that do not take account mailers need to accommodate overseas mailings, nor of the needs of mailers from abroad who send mail to the United States. Moreover, the proposed structure does not lend itself to incorporation into or compatibility with an international standard. On IPC's estimate, a minimum of 6 UPU-specified bits would be required to embed the eventual US solution into an international standards framework.
- 4.2.3 IPC has additionally suggested that the choice of 4-state symbology may not be optimal. 4-state is effective for bar codes applied using ink jet printers of the type used on postal sorting machines, but is less effective for application by other techniques which are commonly used by mailers. It results in a low density code with poor symbol discrimination, especially since USPS are currently proposing to do without synchronisation symbols like those used in S18d. This means that the only way of distinguishing between USPS-proposed 4-state codes and other 4-state codes in practical use will be through the number of bars – and this is likely to give rise to problems, given that bars could be hidden behind envelope window edges.

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- 4.2.4 Because of this, IPC has suggested that USPS look at font-based codes, such as DOTE and ECO. These potentially provide much higher information densities and error correction capability (similar to 4-state codes) but are easier and simpler for mailers to print.
- 4.2.5 IPC has also suggested that the proposals involve inefficient use of the available encoding space: the proposed use of a fixed length 6-digit customer identifier is wasteful and results in a limit of 1m registered users; no use is made of the contribution that the delivery ZIP code can make to item identification and it is proposed to devote a whole bit to distinguishing the use of a ZIP+4+2 delivery code from other cases, when a single value of the format indicator would be sufficient.
- 4.2.6 Notwithstanding these comments, USPS is committed to an initial solution based on 4-state codes and could only look at font-based codes as a possible second step. It has agreed to review use of the encoding range and to consider the possibility of making 6 bits available for standardisation purposes. IPC is to provide input on how this might be achieved. 4 *ipc,jlw*  
5 *usa,hp*
- 4.2.7 In response to questions, USPS stressed that the proposals were not intended for use in the context of postage meters, which are covered by the IBI programme, but for use by large bulk mailers using controlled acceptance procedures.
- 4.2.8 L Pintsov questioned the conclusion that mailers could not yet be asked to print 2-dimensional symbologies and pointed out that Pitney Bowes had demonstrated add-on capability, for its inserters, to achieve this. USPS responded that one of their criteria was that mailers should be able to print the intelligent mail bar code without needing to invest in new equipment. Even so, L Pintsov believed that some mailers would prefer the more flexible solution offered by use of 2-d symbologies and that many others would buy into this approach if it were sold to them effectively, using pricing and service discrimination as arguments. In response, USPS noted that support for 2-dimensional symbologies was certainly intended in the medium term, but that, for short term implementation they wanted a single solution. The decision to base this on 4-state technology was now taken and would be reversed only if tests showed that read rates were inadequate.
- 4.2.9 For Belgian Post, Yves Remy reported that similar arguments had been used to conclude that use of 2-d symbology would be premature and the Belgium Post were also contemplating use of a 4-state solution. However, they are planning to use the routing code as part of the identification value itself. The approach they are planning is linked to the use of customer to post electronic data interchange. It was suggested, and agreed, that a specific presentation on Belgian post plans be given during the next meeting. 6 *ipc,jlw*  
6 *bea,yr*
- 4.2.10 Like USPS, Belgian Post have not (yet) considered font-based codes. Yves Remy asked about the readability of these. IPC responded that, as far as it knew, this was unproven, especially for application on mail. However, from a logical perspective, such codes were formed from elements with a size similar to that used in 2-dimensional symbologies such as Data matrix and, given that similar levels of error correction could be built into their use, there was every reason to suppose that readability would be comparable with that of 2-dimensional symbologies. According to results reported by Deutsche Post, this should be close to USPS' requirement of 99.5%, but a proper international evaluation was needed. IPC had proposed such an evaluation, and the resulting design of a symbology optimised for postal use, in the context of work on ID-tags – but no-one had (yet) been able to devote the resources needed to undertake the required trials.
- ### 4.3 Parcel mail proposals
- 4.3.1 On parcels (slides 11-12), it has also been concluded that the use of 2-dimensional symbologies would be premature. In this case, the intent is to use Code 128 symbology to support a 20 character USPS-defined identifier, which includes a 3-digit service code, and a destination routing code of up to 9 digits. The current proposal is based on use of the UCC/EAN version of the symbology, with application identifier 92 (intra-company internal number) for the identifier and 420 (ship to post code within a single post) for the routing

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code. This results in a Code 128 bar code containing 12, 17 or 19 symbols (excluding start, stop and symbol check value), depending on the presence and length of the delivery code.

- 4.3.2 USPS clarified that, in the case of parcels, the identification value will use a composite 20-digit value which includes a service code (based on the same table as for letters), a 9-digit customer number (DUNS number) and an 8 digit item number. The structure has already been in use since 1995.
- 4.3.3 IPC has pointed out that these proposals are also hardly international in outlook and hardly standards-oriented. Whilst they are based on ISO 15418 as regards the use of application identifiers, they ignore ISO 15459 and the trend to use of licence plates and ignore UPU standard S26. As an alternative, it has proposed the use of S26 licence plates. As shown on slide 12, if USPS is assigned 10 S31 issuer codes, the information it wishes to encode could be built into the part of the licence plate structure which over which it would have control, resulting in a Code 128 bar code length of 15, 17 or 19 symbols. There would thus be no penalty on the overall length of bar codes containing ZIP codes.
- 4.3.4 An alternative to this, if USPS actively does not want to support licence plates, would be to use one of the ISO 15418 data identifiers reserved for UPU use. Provided that one of the two character data identifiers was chosen (e.g. 5U), this would also result in an overall bar code length of 15, 17 or 19 symbols.
- 4.3.5 Finally, IPC has suggested that, whilst incorporation of identifier, service code and routing code into one bar code has some advantages for many mailers, it might not be applicable to all. It believes that USPS should therefore also support the encoding of service code and/or routing code in a separate bar code.
- 4.3.6 L Pintsov agreed with this, pointing out that, depending on the specific mail production environment, mailers had access to required information at different points in the process. He noted that his input to the CBC standard (see 3.1.2) included use cases from which it could be deduced what information could be printed on the item at what point in the process.
- 4.3.7 USPS has agreed to review these proposals before coming to a final conclusion. 7 *usa,hp*

### 4.4 Implications for the CBC standard

- 4.4.1 Using slides 13-15, IPC summarised its conclusions with respect to the proposed CBC standard. The first of these is that the standard should support the combined encoding of identifier, service code and postcode or delivery point identifier into a single compound data construct which could be represented on the item as a single unit.
- 4.4.2 It believes that this should be addressed by defining a single compound data construct with multiple representations: a character-based representation for use in (character-based) EDI messages and industry-standard bar codes (such as Code 128); a binary representation for data storage purposes and for use in binary electronic message representations and one or more post-specific symbology representations. This is illustrated in slide 15.
- 4.4.3 As suggested in the USPS 4-state proposals, IPC believes that the generation of the post-specific representations should be accomplished using post-supplied algorithms/software, so that the user need not be aware of the encoding limitations or of the encoding and error correction mechanisms. This was questioned by L Pintsov, however, since it implies that the mailer has to integrate third-party supplied software into its systems and this could imply significant costs.
- 4.4.4 With this approach, the proposed USPS 4-state letter mail bar code could equate to one of the supported post-specific symbology representations – provided that 6 bits are made available for this purpose.
- 4.4.5 UPU standard S18 provides a possible model for the approach: S18 a defines both character and binary representations, whilst S18b, c and d define three different post-specific symbology representations, two of which restrict the data ranges available in some

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of the components. It may even be possible to utilise the same 64-bit structure, for the identification part of the construct, as is used in S18a. For example, the USPS suggestion of a 15 digit letter mail identifier value could be accommodated by allocating 64 S31 issuer codes for USPS use.

- 4.4.6 L Pintsov questioned this possibility, noting that whilst previous meetings had recognised the need for compound data constructs, and had even suggested structuring the standard in a way that distinguished between basic data and compositions / compound constructs, it had previously been proposed that item identifiers could themselves be constructed from a party identifier and a party-assigned number. Given the agreement that electronic addresses could be used as party identifiers, it was not possible to imagine a binary representation that could be accommodated in 64 bits. It was agreed that further study is needed before a conclusion can be reached on this. 8 *ipc,jlw*
- 4.4.7 Regarding the service indicator component, USPS is proposing use of a three digit code. This ignores the work done, in the electronic messaging field, on service code definition (see S25 and M33a). It may also be questioned whether this is enough for long term use. A possible solution might be to define a mapping between selected S25 service code values and a new 'service number', with (as in S25 service codes) some values of 'service number' being UPU defined, and therefore common to all posts, and others being mail service contractor defined and thus specific to an individual post.
- 4.4.8 In this context it was noted that there could be a distinction between the service bought by the mailer and the service bought (by the origin post) from the delivery post. For example, imagine that the mailer buys a priority guaranteed delivery delay service. If the origin post processes and despatches the item quickly, it might purchase a slow guaranteed delivery delay from the delivery post (or could even risk buying a service without delay guarantee); if not, it might have to buy a faster service in order to meet the guarantee it has given to the mailer.
- 4.4.9 L Pintsov noted that one of the key aspects to be encoded in a service code is that of exception handling. What should happen if the item is delivered late or is mis-delivered, or if the addressee has moved? He reported that he had developed an XML formal description of postal services. This will be presented at the next meeting. 9 *ipc,jlw*  
9 *pib,lp*
- 4.4.10 There are questions, too, about the postcode/delivery point identifier component. USPS wants to accommodate up to 11 digits for domestic mail, but sees a need for only the basic 5-digit ZIP code on incoming international mail. This could be accommodated in a 37-bit structure which allowed use of (up to) 11 digits for domestic mail and a combination of country (10 bit) or issuer (16 bit) code and shorter routing code for cross-border mail. But USPS proposals are based on the assumption that overseas mailers would not know the ZIP+4 or ZIP+4+2 codes to be used. Is this justified – especially in a possible future scenario in which overseas mailers might have full access to intelligent address correction systems on the same basis as mailers based in the United States? And even if USPS might not be able to fully rely on routing codes encoded on incoming cross-border mail, would it not be preferable to have them (to allow cross-checking with data derived from OCR analysis of the address) than to prevent their use? Finally, would a 37 bit structure be sufficient to accommodate the needs of those posts which use alphanumeric post codes: 37 bits would support 7 alphanumeric characters domestically and 4 or 5 internationally?
- 4.4.11 F Gillet questioned the fact that USPS proposals do not allow for any customer-selected data field. Discussions in France had led to the conclusion that customers were interested in applying barcodes, like the one envisioned by USPS, but required that it provide also for the inclusion of customer defined data. Also Australian Post allow 16 bits for customer data. Some customers use this for control of inserting equipment, whilst Correos, in Spain, is deploying systems that can read PDF417 symbols which include 30 characters of data defined by Correos and either 25 or 70 characters of customer defined data.

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#### 5 Progress with drafting of the CBC specification

5.1.1 IPC reported (doc C, slide 16) that it had made little direct progress on updating the draft, but that some indirect progress had been made:

- the updates to S10 have been approved by the Standards Board;
- CEN has approved the ABL and FIM specifications (TS 14657 and TS 14442). These are to be considered by the UPU PEG. However, volunteers will be needed to test them if they are to be adopted as UPU standards. IPC will follow up the interest of La Poste in both specifications, and of TPG in the FIM specification.

10 *ipc,jlw*

5.1.2 Regarding symbologies, IPC again raised the topic of font-based codes (slide 17), noting that, whilst the two which have been discussed (DOTE and ECO) may have IPR issues, it was in fact quite easy to invent others. In this context, reference was made to the paper about adaptive codes which IPC had circulated in 2000. This will be circulated again.

5.1.3 L Pintsov noted that the key to achieving high information encoding density was to design the symbology used around the error characteristics of the medium used for communication. For example, he noted that PDF417 had been optimised for laser scanning applications, whilst an external expert (Blakewood) had been hired by Royal Mail to design its 4-state symbology. It was noted that there is a trade off between the size of element used to represent a bit; the level of error detection/correction at individual character/symbol level and the amount of error correction at the overall bar code level. There is some evidence to suggest that, for postal applications, large elements and character/symbol level redundancy were more important than redundancy at the bar code level.

#### 6 Planning of further work and meetings

6.1.1 The next meeting of the working group was scheduled to take place in Amsterdam on the morning of 9 June 2004 (preceding the ID-tag working group in the afternoon and the UPU DCG/EXG and PEG meetings on 10<sup>th</sup> and 11<sup>th</sup> June). [NB. IPC is advised that TPG will probably host the meetings in Den Haag rather than in Amsterdam; further information will be supplied in due course].

11 *all*

11 *ipc,jlw*

#### 7 A.O.B.

7.1.1 There was no other business.

# Summary of Open Actions

Number	Responsible	Description	Due Date	Reference	Actual Date	Result / Comment
13837	2 ipc	jlw	obtain / circulate upoc - universal postal code - specification	030228	3.1.9	040317: open
13837	3 ipc	jlw	obtain / circulate arriva bar code specification	030228	3.1.9	040317: open
13837	4 ipc	jlw	obtain / circulate deutsche post dpm and brazilian specification	030228	3.1.5	040317: open
13837	5 els	mv	provide ente poste / postel data matrix specification	030328	3.1.6	040317: open
13837	16 ipc	jlw	obtain permission to distribute correos y telegrafos specification	030228	3.1.3	040317: open
14309	5 ipc	jlw	consider caa specification as basis for 4-state	030610	7.1.1	040317: open
14716	2 ipc	jlw	s25 to cover licence plate comprising party id + party assigned number	031231	4.4.8	040317: open
14716	5 ipc	jlw	s19 definition of address zone should reference minimum rectangle and envelope window	031231	4.5.4	040317: open
15270	3 all		report on interest in dote code and similar symbologies	040317	5.2.7	040317: held over until 040609
15270	6 all		questions on dote code for the author	040115	5.2.7	040317: held over until 040609; see also 15301#3.1.5
15270	7 ipc	jlw	invite dote code author to a cbc meeting, if enough interest	040317	5.2.7	040317: held over until 040609
15270	8 ipc	jlw	remove detail from s25; it should refer to cbc standard	040630	5.4.1	040317: open
15270	9 pib	lp	provide examples of use cases or similar for mailer encoding in steps	040317	5.4.10	040317: open
15270	14 ipc	jlw	next draft of S(cbc)-1	040215	6.1.2	040317: open
15301	1 bea	yr	submit eventual corrections to minutes of 17 december	040415	2.1.1	
15301	1 pib	lp	submit eventual corrections to minutes of 17 december	040415	2.1.1	
15301	2 ipc	jlw	process pib-lp input (ipc-jw15302)	040515	3.1.2	
15301	3 ipc	jlw	circulate dote questions and responses	040331	3.1.5	
15301	4 ipc	jlw	suggestions on how to save 6 bits for standardisation	040415	4.2.6	
15301	5 usa	hp	review use of coding range and make 6 bits available in 4-state letter mail cbc	040430	4.2.6	
15301	6 bea	yr	presentation on bea cbc plans linked to edi	040609	4.2.9	
15301	6 ipc	jlw	agenda 040609: bea presentation on their cbc plans linked to edi	040515	4.2.9	
15301	7 usa	hp	review proposal for use of licence plates or 5U on parcels	040430	4.3.7	
15301	8 ipc	jlw	suggestions for binary id need to take account of id = party id + party assigned number	040515	4.4.6	
15301	9 ipc	jlw	agenda 040609: pib, lp presentation on xml service definition	040515	4.4.9	
15301	9 pib	lp	presentation on xml service definition	040609	4.4.9	
15301	10 ipc	jlw	follow-up fra interest in abl, fim testing; nla in fim testing	040430	5.1.1	
15301	11 all		note next meeting - morning of 9 june 2004 in amsterdam	040609	6.1.1	>>>>actually, its likely to be Den Haag
15301	11 ipc	jlw	arrangements for next meeting - 040609 morning	040515	6.1.1	

# Completed Actions

Number	Responsible	Description	Due Date	Reference	Actual Date	Result / Comment
14309	1 caa ju	input on possible applications	030610	5.2.1; 14716#4.3. 1	040317	closed; no input received
14309	2 pib lp	input on possible applications	030610	5.2.1; 14716#4.3. 1	040309	see 15301#3.1.2
14716	1 pib lp	provide detailed comments on introduction and scope	030915	4.2.3	040309	see 15301#3.1.2
15270	1 sie js	do all recent systems support code 128, or do some ONLY support code 39	040317	3.1.3	040309	see 15301#3.1.3
15270	2 all	comments / input on s10 revision proposals to ipc	040121	4.1.2	040309	revised s10 approved by UPU Standards Board
15270	4 sol cc	provide dote code presentation, documentation for circulation	040110	5.2.7	040309	
15270	5 ipc jlw	circulate documentation on dote code	040110	5.2.7	040309	see 15301#3.1.4
15270	10 pib lp	provide draft text on mailer authentication data	040317	5.4.11	040309	see 15301#3.1.2
15270	11 usa hp	further briefing on usps intelligent mail programme	040317	5.5.8	040309	see 15301#4
15270	12 ipc jlw	allow for further briefing on usps intelligent mail programme on agenda	040317	5.5.8	040309	
15270	13 all	comments on S(cbc)-1D	040131	6.1.1	040309	closed; new draft to be circulated by IPC
15270	15 all	next meeting at ipc on 17 march 2004 in the afternoon	040317	6.1.3	040309	
15270	16 ipc jlw	arrangements for meeting on 040317	040303	6.1.3	040309	