

Prestel background SI/G/518PRESTEL BULK UPDATE  
TECHNICAL SPECIFICATION

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The information contained in this document relates to Prestel Public Service version 46.

## SECTION 1 INTRODUCTION

The Prestel System offers two independent methods by which an Information Provider (IP) may update the database. The 'online editor' is used by an IP keying information directly into the system from a standard viewdata terminal and editing keyboard. 'Bulk Update' is used where the input data is supplied to Prestel by another computer system, or by a microprocessor-based intelligent editing terminal.

Although the two input methods are independent, a substantial part of the processing performed by the Prestel system is the same for both types. In particular, input data for both systems is subject to the same security and integrity checks.

This document describes the formats and protocols required for Bulk Update. A working knowledge of the Prestel system and the online editor is assumed.

At present, two different input media are available to Bulk Updaters:

Magnetic tape batch update, with reports output to a line printer;

On-line update via a telephone line, using an asynchronous protocol.

It is planned in the future to introduce in addition a synchronous on-line protocol. This will use the IBM 'BSC' protocol, as defined in the IBM reference manual 'General Information - Binary Synchronous Communications' GA27-3004-2. The GEC implementation of the protocol which will be used by the Prestel system is described in the GEC manual 'Synchronous Communications' DD1306.

## SECTION 2 RECORD TYPES

1 This section describes the record types available to the Bulk Update user. Detailed input record layouts are at Appendix B, with explanatory notes at Appendix A. A copy of the viewdata character code table is at App F.

2 It should be noted that the records are processed serially - the database is updated by each record in turn. The IP must ensure that the records appear in a valid order; for example, a page may not be deleted while any filials exist.

### RECORD TYPES

3 RUN HEADER/LOGON RECORD The first record of a run (magtape or online) must by a 'logon request', to identify the IP to Prestel and enable his file data (logo, CUGs etc) to be accessed. The record contains the following information:-

3.1 USER ACCESS CHECKS The record contains a systelno and an editing password identical to the current password used by the IP for online editing. If the run header is not the first record, or if the systelno or editor password are invalid, an appropriate error message is output (see App C) and the bulk update run is stopped.

3.2 OUTPUT IDENTIFICATION (MAGTAPE ONLY) The record also contains a name and address which are printed on the first page of the output report.

3.3 ONLINE UPDATE. If the 'reply wanted' indicator was set on the input record, a full 'logon reply' is transmitted to the IP's computer (format at App C page 1), otherwise a standard 'update ok' (ie a '0') is transmitted.

4 BATCH HEADER (MAGTAPE ONLY) This signals the start of a batch of update records.

5 BATCH TRAILER (MAGTAPE ONLY) This signals the end of a batch of update records, and contains counts of the number of records in the batch.

6 UPDATE RECORDS These records are used to update the framefile on the database. The six data types available are:

6.1 INSERT FRAME This record is used to enter a page or frame (equivalent to the 'enter' option in the online editor) and therefore contains the appropriate fields ie page number, frame-id, cugs, frame type, price, routeing choices and frame contents.

6.2 REPLACE FRAME TABLE This record is used to amend an existing frame (equivalent to the 'overwrite' option in the online editor) and contains the same fields as 'insert frame' (para 6.1).

NOTE: The frame contents field may be omitted in this record, thus amending only the frame control information, and leaving the displayed information unaltered.

6.3 REPLACE FRAME This record is used to amend only the displayed part of an existing frame (equivalent to the 'amend' option in the online editor). It contains an identifying page number, frame identity and the frame contents field. Note that the frame contents are completely replaced by the new version - there is no facility to supply amendment data only.

6.4 DELETE PAGE This record is used to delete all the frames of a page (equivalent to 'delete page' option in the online editor). It contains just an identifying page number.

6.5 DELETE FRAME This record is used to delete the last frame of a page, ie frame identity b-z (equivalent to 'delete frame' option in the online editor). It contains an identifying page number and frame identity.

6.6 REINSERT FRAME This record type, for which there is no equivalent in the online editor, acts as a 'replace frametable' (see 6.2) if the frame already exists on the database, or as an 'insert frame' (see 6.1) if it does not exist.

7 RETRIEVE FRAME This record contains a page number and a frame identity, and results in a frame being retrieved from the database. Only the IP's own frames may be retrieved in this way.

7.1 MAGTAPE UPDATE The frame and its control details are printed on the output report. Control characters are not printed and graphics characters are replaced by '\*'. Only 30 such records are allowed in a batch, any extra ones being ignored.

7.2 ONLINE UPDATE The frame and its control information are transmitted to the IP's computer in the format shown at App C page 3.

## 8 MESSAGE CONTROL RECORDS (ONLINE ONLY)

These record types are used to retrieve message/response frames or send messages to other IP's, equivalent to the facilities available on pages 930 and 931 in the online user system. 4 record types are available:

8.1 RETRIEVE NEW MESSAGE. This results in the transmission of the first new message to the IP's computer, (layout at Appendix C). If no new messages are available, an error code is sent (Appendix D4). Note that if the next record is neither a STORE MESSAGE nor a DELETE MESSAGE, this message remains the first new message, so another RETRIEVE NEW MESSAGE will get the same message again.

As for the online user system, a charge is made for message retrieval. At present, the IP's frame charge total is incremented by 3p for each new message retrieved.

8.2 RETRIEVE STORED MESSAGE. The first such record retrieves the first stored message, and subsequent records retrieve the following stored messages in turn. It is not necessary explicitly to re-store a message having retrieved it, but no error occurs if this is done

8.3 STORE CURRENT MESSAGE. This record type is only valid immediately following a RETRIEVE MESSAGE (NEW or STORED), and results in the current message being stored.

8.4 DELETE CURRENT MESSAGE. This record type is only valid immediately following a RETRIEVE MESSAGE (NEW or STORED), and results in the current message being deleted.

9 RUNTRAILER/LOGOFF RECORD This record terminates the run.

9.1 MAGTAPE UPDATE. The Run Trailer record contains a count of the number of batches expected. A summary report is printed and the run terminates.

9.2 ONLINE UPDATE After receipt of this record, a 'logoff reply' (see App C) is transmitted and the telephone connection broken.

### SECTION 3 MAGNETIC TAPE UPDATING

1 This section describes the requirements of the magnetic tape batch updating system. Detailed record layouts are given at Appendix B, with explanatory notes at Appendix A, and a list of error messages which may appear on the output report is at Appendix D.

#### MAGNETIC TAPE FORMAT

2 CHARACTERISTICS The tape used must have the following characteristics:

2.1 NRZI mode;

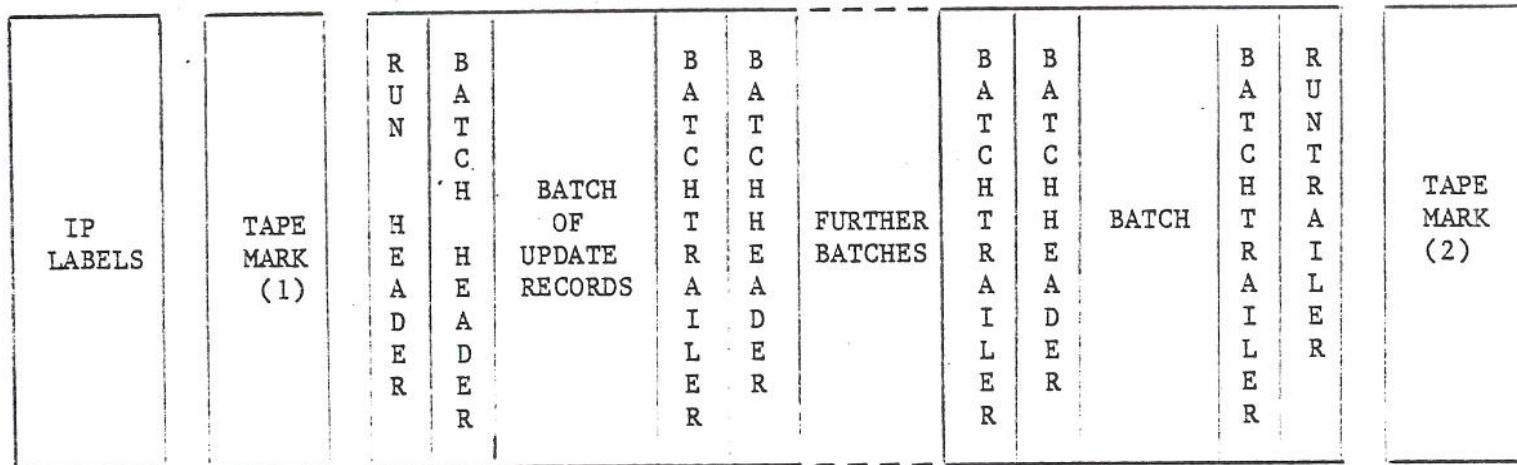
2.2 Nine track;

2.3 800 bpi;

2.4 No coupling;

2.5 Reel size between 6 in (200 ft) and 10.5 in (2400 ft).

3 TAPE LAYOUT: Data is arranged on the tape in the following layout:

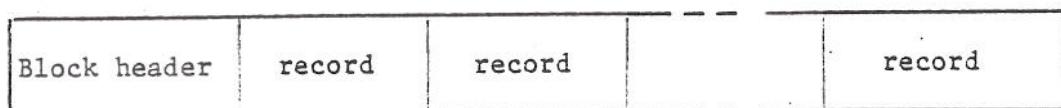


3.1 IP LABELS (optional). These are included for compatibility with other computer systems, but have no significance for Prestel. All data before the first tapemark is ignored.

3.2 TAPEMARK (1). Signals the start of the user data.

3.3 TAPEMARK (2). Signals the end of the user data. No attempt is made to read beyond the second tapemark.

4 BLOCK LAYOUT The user data records are held in blocks in the following format (IBM RECFM=VB):



4.1 The block header consists of

2 bytes - block length (including block header)

2 bytes - block number

Both fields are held as binary numbers. If a block is read out of sequence, the run is halted. If the blocknumber field contains zero or spaces, block number checking is not performed.

4.2 The maximum size of a block is 3000 bytes. A record may not be split between two blocks.

5 BATCH CONTROL Data records must be grouped into batches of not more than 100 records, by use of batch headers and trailers (DTs 03, 04). Any records over the maximum are ignored. A separate count is kept of DT31 (print frame) records; only 30 such records are allowed in a batch. Any records not preceded by a valid batch header are ignored, and if the first record following the run header is not a batch header, the run is terminated.

At the end of a batch, counts of each record type are compared with the 'expected' figures from the batch trailer. If they do not match, a warning message is printed, but the run continues.

#### OUTPUT REPORTS

6 A printed report is produced listing all batch headers and trailers and identifying any erroneous data records. The IP's name and address from the run header record is printed on the first page of the report. A summary is printed at the end of the report identifying the number of records read, number of errors found, and the net change in the number of frames on the IP's database.

7 In addition to the printed reports, a series of message frames is generated and sent to the IP, containing all the information from the printed report except the name and address and 'retrieved frame' prints. The system will not attempt to generate more than 20 such message frames in a single run.

## SECTION 4 ONLINE UPDATING - ASYNCHRONOUS PROTOCOL

1 This section describes the requirements of the asynchronous protocol used for online bulk update. Detailed input and output record layouts are given at Appendices B and C, with explanatory notes at Appendix A. Reply codes are listed at Appendix D. Telecom requirements are set out in Appendix E

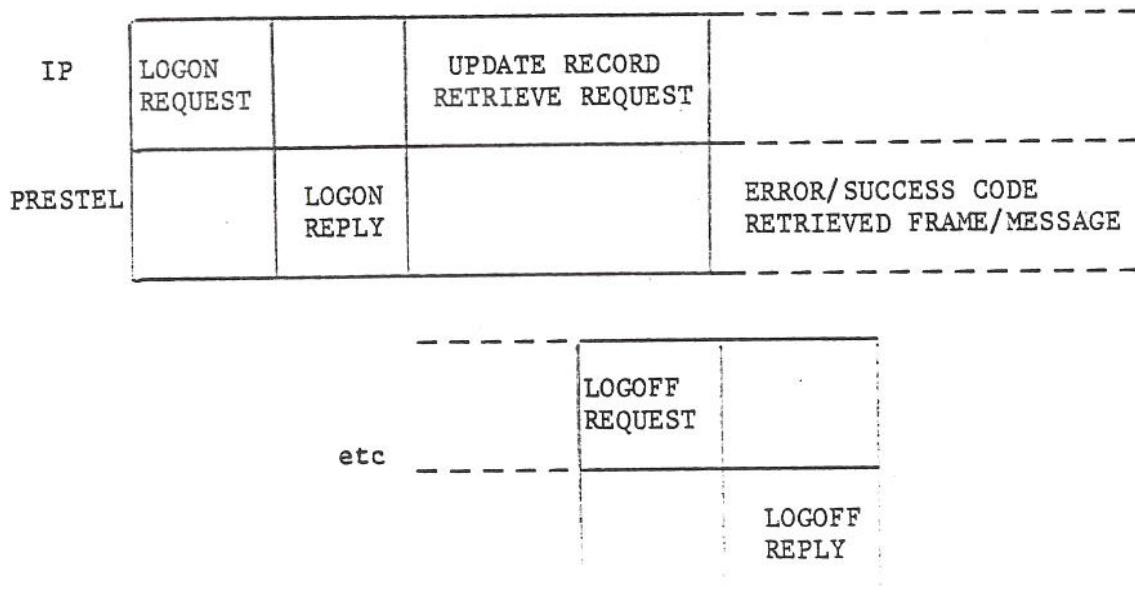
### ASYNCHRONOUS COMMUNICATIONS PROTOCOL

2 TRANSMISSION CHARACTERISTICS. The basic transmission characteristics are as follows:

- 2.1 300 baud (Datel 200)  
or 1200 baud (Datel 600);
- 2.2 Half-duplex mode;
- 2.3 1 start bit, 1 stop bit;
- 2.4 Even parity;

3 CALL SET-UP. The facility is accessed via the switched telephone network, by calling the appropriate bulk update number, depending on the speed required. The call is answered automatically, and a carrier tone is heard. The tone remains for 10 seconds, during which time the IP should establish the connection to his computer. At the end of the 10 seconds a '1' block is transmitted by the Prestel system, which is then ready to receive the first record (ie the 'logon request'). If the logon request is transmitted by the IP before the end of the 10 seconds, no harm is done, as the '1' block will be recognised by the IP's computer as a negative acknowledgement (see 5.1 below), and the logon request will be automatically retransmitted.

4 CALL PROGRESS. Having established the call, the dialogue proceeds with the computers sending alternate messages as follows:



5 BLOCK FORMAT To minimise the effect of transmission errors a record is split into blocks of a smaller size which are transmitted separately and re-assembled at the receiving end. The maximum size of a transmitted block is 80 bytes. The format is as follows:-

PAD SOH TAG STX <data><term><bcc> US

where PAD is any non-significant character; present for timing purposes only, ignored by the receiving machine

SOH identifies the position of the TAG character

TAG is used for diagnostic purposes. It takes the value '0', '1', --- '7', '0' -- etc on successive blocks transmitted. If a block is retransmitted because of a timeout, TAG is not incremented. This enables the receiving computer to detect missing or repeated blocks.

Note: in the current Prestel version, the SOH and TAG characters are generated on all output blocks but not checked for on input.

STX identifies the start of the data.

<data> is the information part of the block;  
maximum length 75, minimum length 0

<term> is the data terminating character;

ETX if this is the last block of a record;  
ETB if more blocks for the same record follow;

<bcc> is the block check character, formed by performing an 'exclusive or' operation on all the characters following STX (horizontal parity check). The parity bit itself is not included in the horizontal check, but is set so as to make the bcc itself have even parity.

US is the unit separator character required as a block terminator by the software. If the bcc character happens to be a 'US', the final 'US' must be omitted - ie only one US is allowed in any one block.

5.1 Receipt of a block is acknowledged by a block of the same general format whose <data> field is a single character as follows:

0 means the block was received correctly (but see 5.2 below);

1 means that a parity or bcc error was detected - the block must be retransmitted; after 12 such retransmissions, the call is abandoned.

3 means that the actual length of the record is not as specified in the 'record length' field, or that the record is too long for the input buffer (can be the result of transmission errors). The whole record should be retransmitted. If a '3' is received in response to an ETB block, the record must be terminated before it is retransmitted, by sending an ETX block, which will be acknowledged by a '3'. If this is not done, Prestel is unable to distinguish the retransmitted record from the previous one, and will therefore give a '3' reply to the retransmission as well when the ETX is eventually received.

5.2 Positive acknowledgement of the final block of a record (ie one terminated by ETX) is neither required nor expected; it is in fact implied by the transmission of the next record, which will normally be an update success or failure code from the Prestel computer, or another data record from the IP. If an acknowledgement ('0') block is sent under these circumstances, it is treated by Prestel as if it were a new data record, and failed with code 3 (record length error).

6 TIMEOUTS To guard against the possibility of a block being lost in transmission a timeout is applied after each block is sent. If no return message is received within the timeout period, the block is retransmitted. If no reply is received after 12 such retransmissions, the call is abandoned. The timeout values currently applied are (approximately):

6.1 after transmission of ETB block: 2 seconds

6.2 after transmission of ETX block: 10 seconds

To avoid the possibility of both computers timing out and retransmitting at the same time, the IP should employ different values - say 4 and 12 seconds.

## 7 ERROR CONDITIONS

7.1 Under conditions of heavy load, it is occasionally possible for a retransmission to occur when no transmission loss has actually occurred; this can result in a block being received twice. In such a case, the 'record length' check which is applied after receipt of the ETX block will detect the error and result in the whole record being sent again.

A similar record length check should be applied by the IP on receipt of a retrieved frame or message (DTs 03, 04, 05). If the check fails, retransmission must be requested by sending again the original request (DT 31, 41, 42) rather than by sending simply a '3'.

7.2 In some circumstances it is possible for the IP to treat Prestel's retransmission of a block as if it were the reply to a new request from the IP. This is particularly unfortunate if the records involved are a 'retrieve frame' request from the IP and a 'page/frame does not exist' from Prestel. The use of the TAG character (see para 5) should assist in detecting this situation; alternatively, it may be found prudent for the IP's computer to retry automatically every failed 'retrieve frame' request.

7.3 If an invalid block is received in reply to an ETB block (when '0', '1' or '3' is expected) it should be ignored: if it was pure noise, the 'real' block will arrive soon, if it was the 'real' one, but corrupted, the timeout mechanism will arrange for retransmission.

If the block received in the same situation is not invalid but unexpected (ie not a '0', '1' or '3'), it should be treated as a '0': any other reply is likely to involve further retransmissions followed by loss of the call.

## PRETEL BULK UPDATE

### NOTES TO RECORD FORMATS

1 This Appendix explains the various codes and symbols used in the record layouts in Appendices B and C, and also describes the contents of the various fields.

Some record types are applicable to both online and magtape update - these are headed 'BULK UPDATE' - whereas others are headed 'MAGTAPE UPDATE' or 'ONLINE UPDATE' as appropriate.

### COLUMN HEADINGS

2 POSITION. These columns define the position of the field in the record.

3 FIELD-NAME. Describes the contents of the field.

4 PICTURE. Describes the format of the data within the field. The codes used have the following meanings:

ZN = numeric characters, right-aligned, zero-filled. An unused entry (eg in the CUGS field) consists of all zeroes or all spaces.

SN = numeric characters, right-aligned, space filled. An unused entry (eg an 'invalid choice' entry in CHOICES) consists of all spaces.

A = Upper or lower case alphabetic character (not space)

AN = Upper or lower case alphabetic, or numeric character.

V = any viewdata character except cursor controls (ie columns 0 & 1 of the code table) but including ESC, CR, LF. The FF (clearscreen) character is also allowed, but only for the specification of response frames (see 11.5 below). In addition the characters SI, SO, SS2, SS3 are acceptable; they are reserved for use with specialised terminals in the specification of alternate character sets.

5 SIZE. Shows the size of the field in bytes.

6 OCCS. Shows the number of times the field is repeated.

### FIELD CONTENTS

7 RECORD LENGTH. All record lengths are inclusive of the record length field itself. For magtape records, the field consists of two subfields: the first two bytes hold the length in binary, the second two bytes are ignored. For on-line records, the format is ZN - a four digit decimal number.

8 CUGS

8.1 USER ACCESS. This corresponds to the 'user access' prompt in the online editor. A value of Y or space signifies that all users (subject to CUG check) may view the frame, while a value of N means that only the IP himself may access it (regardless of CUG checks).

8.2 CUG. Any frame may be placed in any CUG which the IP owns, by quoting the appropriate 5-digit CUG number. If the field is all spaces or all zeros, the frame is placed in CUG number 2 (the 'null CUG'), to which all users have access. This value will also appear in a 'retrieved frame'.

9 CHOICES. The ten choice fields denote the page numbers to be selected when the user keys the digits 0-9 respectively. If any choice field is left blank, the choice is invalid, and the user will receive the 'SORRY NO SUCH PAGE' response.

10 FRAMETYPE. Upper or lower case alphabetic; I, i or space denotes an information frame, A, a, R or r denotes a response frame.

## 11 FRAME CONTENTS

11.1 A line of data displayed on a viewdata screen consists either of:

- a. exactly 40 displayed characters; or
- b. less than 40 characters, terminated by CR LF characters; or
- c. a blank line, consisting of CRLF, or LF alone.

11.2 The 'frame contents' field consists of up to 23 such lines. The first line of the input data is always replaced by the standard Prestel line 1 (IP logo, page number, price). The top line may be represented in the input record by the minimum length line CRLF, or just LF. Any data beyond the 23rd line is ignored, as the Prestel system uses line 24 for system messages to the user.

11.3 Every viewdata control character (columns 4b and 5b of the code table) is identified by being preceded by an ESC character. The control character itself occupies a single position on the screen, but the ESC does not, so a data line input to the bulk update system may contain more than 40 actual characters, provided that the number of displayed characters (ie excluding ESC) does not exceed 40. However, the total space available within the system for storing a frame including ESCs, is 920 characters for an information frame or 716 characters for a response frame. Line 1 occupies at least 43 characters (depending on the number of control characters in the IP's logo), so the space available for an IP's data is 877 characters at most. To make the most of the space available, the Prestel system 'optimises' the frame contents by removing spaces at the end of lines, replacing them by CRLF characters. If the frame is still too long after this optimisation, any excess characters are ignored.

11.4 The only cursor control characters which may appear in the 'frame contents' field are CR LF. If any other cursor controls are present, or any other invalid characters, they are replaced by DEL characters, which appear on the screen as a white box. If this occurs more than 20 times on a single frame, the record is rejected (code V, see App D2).

11.5 RESPONSE FRAME A dialogue field is signalled by a 'clearscreen' character (HEX'0C') followed by a permissible dialogue character (lower case a-z). This is then followed by any number of the same dialogue character; the end of the field is signalled by the first occurrence of any other character. The 'clearscreen' character becomes the 'privileged space' and the dialogue characters define the dialogue field. The standard

dialogue characters eg 'n' (name), 't' (telephone number) 'd' (date and time), 'a' (address) have the same special significance as for the online editor, and free format fields (to receive user data) are denoted by any other permissible dialogue character - conventionally 'f'.

**Notes** MAGTAPE UPDATE ONLY

See Appendix A for notes

**Notes** MAGTAPE UPDATE ONLY

See App A for notes

**Notes** ONLINE UPDATE ONLY

**REPLY WANTED** determines the type of reply wanted if logon is successful:

0 : a simple '0' reply code is sent

1 : a full message (as in App C Sheet 1)

## Notes

ONLINE UPDATE ONLY

**Notes** MAGTAPE UPDATE ONLY

See App A for notes

## Notes

MAGTAPE UPDATE ONLY

See App A for notes

## Notes

- 1 See App A for notes

2 If the FRAME CONTENTS is not present (RECORDLENGTH = 127 or 128), only the frame table information is amended. If only a single byte is present after the FRAMETYPE field, this is not deemed to constitute a frame.

If the RECORDLENGTH is 129 or 130, the frame contents are cleared to spaces.

## Notes

See App A for notes