



e-asTTle Upload Specification

**For uploading school, student and group data
from student management systems into
e-asTTle**

(For use with e-asTTle 7.12)

Version 3.5

Issued: 17 December 2013

Assessment Tools for Teaching and Learning Project (asTTle)

Overview

The purpose of this specification is to define the necessary fields and format required when creating an e-asTTle compatible import file. This format should be used when exporting data from the Student Management Systems (SMSs) for use in e-asTTle.

This document is broken down into sections:

1. General Information
2. Detailed description of each section
3. Field definitions
4. Example of a valid e-asTTle Import File
5. A working example with detailed explanation of each of the values displayed in the sample import file.

1. General Information

a) File Definition Information

- The file extension must be `.ast`
- The file is made of a number of sections. Each section and the order of sections are mandatory. The sections and order are as follows;

Header

Import_Type

School

Class

Student

Student_Class

Footer

- The beginning of the section must include the keyword SECTION followed by the name of the section e.g., “Header”. School, Class, Student, and Student_Class sections must also be followed by the keyword “ROWS” and the number of rows appearing in that section.

SECTION,Header

SECTION,School,ROWS,1

- Blank rows are permitted anywhere in the file.
- Column names should NOT be used in the file however the column order is critical.
- Data for only one school can be exported in any one file.
- All classes must be included in the file. When existing classes or schools are re-imported, all group/class associations must be included as the old ones will be replaced; any associations that exist in e-asTTle but not in the file will be deleted.
- Students will not be deleted.
- All line breaks must be CRLF regardless of Macintosh or Windows.

Note: The upload file must not contain control characters other than CR (0xD), LF (0xA) or TAB (0x9). Appendix A contains a complete list of all the characters that are not allowed in the upload file.

Commas are not allowed within fields in this file (as they are the delimiters) and must be stripped out.

b) Testing the import file

A test plan and test scripts will be provided for SMSs.

c) Further Support

For enquiries and support about the specification please contact:

MOE Contact Centre

Phone: 0800 225 542

e-mail: moe.contactcentre@minedu.govt.nz

2. Description of Each Section

a) Header Section (required)

This section specifies:

- The name of the file
- The date and time the file was created
- The import specification number

For e-asTTle the import specification number is 10. This value enables e-asTTle to determine what format the file is in upon import. Any file with a different specification number will be rejected as 'invalid'.

Example:

SECTION,Header
sample.ast,2013-05-03 01:33:45.264,10

b) Import_Type Section (required)

The import type section defines what type of data the import file contains.

This Specification defines the “CLASS” import file.

For Student Management Systems, this section will be always be defined as in the example below.

Example:

SECTION,Import_Type
Class

c) School Section (required)

This section defines the school information. If there is more than one entry in this section then the entire import will not be allowed. The Ministry of Education (MoE) number for the school must be used as the school id.

| | |
|-----------|--|
| School_ID | A code assigned by the MoE to uniquely identify each school. Maximum of 4 numeric characters. |
|-----------|--|

| | |
|--|---|
| | This field cannot be blank and leading zeroes must be truncated. * Mandatory |
|--|---|

Example:

```
SECTION, School, ROWS, 1
3271
```

d) Class Section

This section defines the classes or groups that are present in a school and relevant to e-asTTle. The SMS must give the user the option to limit the inclusion of classes/groups to only those that are relevant to literacy and numeracy. The objective of this requirement is to reduce the significant performance hit when the export data is loaded into e-asTTle because classes and groups that have nothing to do with literacy and numeracy at asTTle year levels is exported. There may be several “classes” as students may belong to more than one class.

For example it is recommended that along with the traditional classes, that separate year group classes are also created. Each student would then be associated with their own individual classes as well as a year group.

| | |
|-----------------|---|
| Export Class ID | Unique identifier (within each school-specific file) for each class/group. This field must not be blank and can be any numeric character. * Mandatory |
| Name | Name of the class Maximum of 40 alpha-numeric characters. This field must not be blank and must be unique for every class/group. * Mandatory |
| Class Complete | It indicates whether the entire class/group is included in the file. (See Note 1 below) For Import Type “Class” this is always set at Y. This field must not be blank. * Mandatory |

There must be one row in this section for every unique export class id in the student_class section. You may have more than one class per school, per student.

Notes:

1. This was used to indicate whether an export was for a test (and then possibly not a whole class) = N, or for a Class (and then everyone gets included regardless of test completion status) = Y.

Example

```
SECTION, Class, ROWS, 3
58, Year 9, Y
59, Class 9YN, Y
60, Class 9ZN, Y
```

e) **Student Section**

This section defines each of the students. It is important that this section is complete. If mandatory fields are not complete, there is no guarantee that the student class associations can be added into e-asTTle.

| | |
|--------------------|--|
| Student_ID | <p>Student Identifier Unique identifier for each student as defined by the school's computer system (SMS) Maximum of 10 alphanumeric characters. Must be unique (to the school). This field must not be blank. * Mandatory</p> |
| NSN | <p>National Student Number It is a Record of Learning number allocated by ENROL. Must be a 10 digit number (natural). Must be unique. Must be a valid NSN (must pass the modulus 11 rule). This field must not be blank. * Mandatory</p> |
| Surname | <p>Student's legal surname Maximum of 60 characters. This field must not be blank. * Mandatory</p> |
| Firstname | <p>Student's legal first name Maximum of 60 characters. This field must not be blank. * Mandatory</p> |
| Current Year Level | <p>This is the year level of the student's class cohort and the level at which the student spends most of their time at school. Must be between 1 and 13. This field must not be blank. (See Note 1 below) * Mandatory</p> |
| Gender | <p>Code to identify the gender of a student. M = Male F = Female This field must not be blank. * Mandatory</p> |
| Language | <p>Code to identify the language spoken at home 1 = English 2 = Language other than English This field can be blank (two consecutive commas) if this is not known. * Optional</p> |
| Ethnic1 | <p>The ethnic group to which a student identifies with. Use equivalent DMU code. (See Note 2 below) The SMS must populate the ethnicity stored as the first ethnicity on the student record as the ethnicity in the upload file. * Mandatory</p> |

Before the SMS generates the upload file, the SMS must first check if all mandatory fields are valid for the students selected for upload. The following business rules must be checked:

| | |
|----------------------|---|
| • Student ID | This field must not be blank. |
| • NSN | NSN must not be blank, must be a 10 digit number and must be a valid NSN (must pass the modulus 11 rule). |
| • Surname | This field must not be blank. |
| • First Name | This field must not be blank. |
| • Current Year Level | This field must be between 1 and 13 and must not be blank. |
| • Gender | This field must not be blank and must be either M or F. |
| • Ethnicity | This field must not be blank and must be a valid DMU code. |
| Student/Classes | Each student selected must belong to at least one class in the class section. |

If one or more selected students violate the business rules, then the SMS has two options both of which are acceptable:

1. The school user is informed that some students have validation errors. The user must be prompted with the following message: "Errors were found for certain selected students. Please check the error report. Do you want to continue to generate the upload file? Y/N". If the user decides to continue then the SMS excludes those students that have data validation issues and only include students who pass the data validation.
2. The SMS does not create an upload file until all data errors have been corrected.

In both cases the SMS must produce an exception report that shows which fields have data errors. The report must include the following columns:

1. Student ID
2. NSN
3. First Name
4. Surname
5. Error Description

Examples:

- Invalid NSN
- First name is missing
- Student does not belong to any classes

Notes

1. Current Year Level

Valid entries in the Student section and Student Class section of AST files for Current Year Level are from Years 1 through to 13 inclusive.

Student data outside this range (Years 0 and 14-15) will not be loaded into e-asTTle, with any entries in the Student section and the Student_Class section being rejected.

Note:

- e-asTTle supports Years 4 through to 12 inclusive for e-asTTle assessments and reporting purposes.
- Students with Years 1 to 3 and Year 13 will be accepted to allow the e-asTTle Numeracy Project Assessments to record stages for students from Years 1 to 13. Students with Years 1 to 3 and Year 13 will not be able to be included in e-asTTle assessments and reports.

2. Ethnicity

Appropriate DMU codes are:

| DMU Code | Description |
|----------|-----------------------|
| 111 | NZ European / Pakeha |
| 121 | British / Irish |
| 122 | Dutch |
| 123 | Greek |
| 124 | Polish |
| 125 | South Slav |
| 126 | Italian |
| 127 | German |
| 128 | Australian |
| 129 | Other European |
| 211 | Maori |
| 311 | Samoan |
| 321 | Cook Island Maori |
| 331 | Tongan |
| 341 | Niuean |
| 351 | Tokelauan |
| 361 | Fijian |
| 371 | Other Pacific Peoples |
| 411 | Filipino |
| 412 | Cambodian |
| 413 | Vietnamese |

| DMU Code | Description |
|-----------------|-----------------------|
| 414 | Other Southeast Asian |
| 421 | Chinese |
| 431 | Indian |
| 441 | Sri Lankan |
| 442 | Japanese |
| 443 | Korean |
| 444 | Other Asian |
| 511 | Middle Eastern |
| 521 | Latin American |
| 531 | African |
| 611 | Other Ethnicity |
| 999 | Not Stated |

Example:

```
SECTION,Student,ROWS,2
111031,1234567899,Beer,Anita,7,F,1,111
111064,1234567901, Carmichealson,Annika,6,F,1,611
```

f) Student_Class Section

This section contains records that relate students to classes. There must be at least one Student_Class entry for **each** student and only for those classes that are referenced in the Class Section of the upload file. **A student can be in many classes.**

| | |
|-----------------|--|
| Student_ID | Must be valid ID from Student Section. This field must not be blank. * Mandatory |
| NSN | Must be a 10 digit number (natural). Must be unique. Must be a valid NSN (must pass the modulus 11 rule). * Mandatory |
| Export Class ID | Must be valid ID from Class Section. This field must not be blank. * Mandatory |

If student is section included in the file, the student ID must be present in that section.

Example:

```
SECTION,Student_Class,ROWS,3
111031,1234567899,58
111031,1234567899,59
111064,1234567901,59
```

Here student 111031 is in class 58 (Year 9) and class 59 (Class 9YN)

g) Footer Section (required)

This section specifies:

- The name of the file. This must be the same as the filename appearing in the Header section.

Example:

SECTION, Footer
sample.ast

3. Field Definitions

| Column | Data Type | Value | Comments |
|-------------------------------|--------------|-------------------|---|
| Section separator | Text(7) | SECTION | |
| Section name | Text(6) | Header | |
| Filename | Text (60) | <please provide> | The name of this file. |
| File date | TIMESTAMP | <please provide> | File creation date/time YYYY-MM-DD HH:MM:SS.MIL. |
| e-asTTle specification number | Integer | 10 | e-asTTle has specification number "10". |
| | | | |
| Section separator | Text(7) | SECTION | |
| Section name | Text(11) | Import_Type | |
| Import type | Text(7) | Class | This file has an import type "Class" i.e., the file contains student's data only (no tests). For SMS it will always be "Class". |
| | | | |
| Section separator | Text(7) | SECTION | |
| Section name | Text(6) | School | |
| Rows indicator | Text (4) | ROWS | |
| Number of Rows | Integer | 1 | Only 1 school is allowed in this file. Multiple schools achieved by separate files for each school. |
| School ID | Integer | < please provide> | Unique school id. This is the code assigned by the MoE. (up to 4 numeric characters) |
| | | | |
| Section separator | Text(7) | SECTION | |
| Section name | Text(5) | Class | |
| Rows indicator | Text (4) | ROWS | |
| Number of Rows | Integer | <please provide> | Up to 32767 rows. The number of classes in this section. |
| Export Class ID | Integer | <please provide> | Unique class id. (Unique within this file) Up to 32767 rows. |
| Name | Text (40) | <please provide> | Name of the class. Must be unique. |
| Class complete | Text(1) | Y | Always use 'Y' |
| | | | |
| Section separator | Text(7) | SECTION | |
| Section name | Text(7) | Student | |
| Rows indicator | Text (4) | ROWS | |
| Number of Rows | Integer | <please provide> | Up to 32767 rows. The number of students in this section. |
| Student ID | Text (10) | <please provide> | Unique student id. |
| NSN | Numeric (10) | | NSN number as provided by the MoE. Must contain 10 and only 10 digits and must be a valid NSN (must pass the modulus 11 rule) |
| Surname | Text (60) | <please provide> | Student surname. |
| First name | Text (60) | <please provide> | Student first name. |
| Current Year Level | Integer | <please provide> | From 1 to 13. See Note 1 on page 6 for upload validations that occur in e-asTTle. |
| Gender | Text (1) | <please provide> | M/F – this is mandatory |
| Language | Integer | <please provide> | Language spoken at home; 1=English, 2=Other than English, blank = unknown |
| Ethnic1 | Integer | <please provide> | DMU Ethnicity code |
| | | | |
| Section separator | Text(7) | SECTION | |
| Section name | Text(13) | Student_Class | |
| Rows indicator | Text (4) | ROWS | |
| Number of Rows | Integer | <please provide> | Up to 32767 rows. The students in classes in this section. |
| Student ID | Text (10) | <please provide> | Unique student id. Refers to a student listed in the student section (must map back to the Student ID). |
| NSN | Numeric (10) | | NSN number as provided by the MoE |
| Export Class ID | Integer | <please provide> | Unique class id. Refers to a class listed in the class section. |
| | | | |
| Section separator | Text(7) | SECTION | |
| Section name | Text(7) | Footer | |

| | | | |
|-----------|-------------|------------------|------------------------|
| File Name | Text (60) | <please provide> | The name of this file. |
|-----------|-------------|------------------|------------------------|

4. Sample Import File (sample.ast)

```

SECTION,Header
sample.ast,2007-05-03 01:33:45.264,10

SECTION,Import_Type
Class

SECTION,School,ROWS,1
3271

SECTION,Class,ROWS,3
58,Year 9,Y
59,Class 9YN,Y
60,Class 9ZN9ZN,Y

SECTION,Student,ROWS,13
111031,1234567899,Beer,Anita,7,F,1,111
111064,1234567901, Carmichealson,Annika,6,F,1,111
111027,1234575432,Cincinnati,Sachin,7,M,2,111
111041,2345676543,Great,Charles,7,M,1,211
111032,3456787654,Redding,Finger,7,F,1,111
111024,4567898765,Schedule,Fought,7,F,1,111
111039,1345676543,Adviser,Laura,6,F,1,111
111008,1245676543,Bing,Squan,7,M,2,111
111068,1256787652,Capsule,Average,5,F,1,111
111005,1267898765,King,Eric,7,M,1,211
111093,1278929872,Bookmark,German,6,M,2,111
111070,1298767892,Boom,Mike,5,M,1,211
111089,9874646478,Leapord,Tourney,5,M,1,111

SECTION,Student_Class,ROWS,17
111024,4567898765,58
111027,1234575432,58
111031,1234567899,58
111032,3456787654,58
111041,2345676543,58
111005,1267898765,59
111008,1245676543,59
111031,1234567899,59
111039,1345676543,59
111041,2345676543,59
111064,1234567901,59
111068,1256787652,59
111024,9874646478,60
111068,1256787652,60
111070,1298767892,60
111089,9874646478,60
111093,1278929872,60

SECTION,Footer
sample.ast

```

Please refer to Section 5 for detailed information on various sections of the import file.

5. Understanding asTTle Import Files

An example of the import file “**sample.ast**” has been shown in the previous section of the document. This appendix aims at providing additional explanatory details to help understand the structure and formation of asTTle import file.

Below is the step-by-step explanation through various sections of “sample2.ast”

Header

asTTle file must always start with the “Header” section.

```
SECTION,Header  
sample2.ast,2007-05-03 01:33:45.264,10
```

| | |
|-------------------------|---|
| sample2.ast | Name of the asTTle file Note that import file extension must be <i>.ast</i> |
| 2007-05-03 01:33:45.264 | Date/Time of the file creation, this is local time. This file has been created at 1:33 on 3 rd May 2007. |
| 10 | Import specification number. This must be “10” for e-asTTle |

Import_Type

The “Header” section must always be followed by “Import_Type” section. For School Management Systems, this will always be ‘Class’.

```
SECTION,Import_Type  
Class
```

| | |
|-------|--|
| Class | This file has an import type “Class” i.e., the file contains students data only (no tests) |
|-------|--|

School

Only **one** school can be imported at a time. Therefore there can be only one school in the “School” section. This section is mandatory.

```
SECTION,School,ROWS,1  
3271
```

| | |
|------|--|
| 3271 | School number. This is number assigned to the school by the MoE. |
|------|--|

Class

Each row of the “Class” section refers to one class

```
SECTION,Class,ROWS,3  
58,Year 9,Y  
59,Class 9YN,Y  
60,Class 9ZN,Y
```

| | |
|----------------------|-------------------------------|
| SECTION,Class,ROWS,3 | 3 classes in “Class” section. |
|----------------------|-------------------------------|

58,Year 9,Y

| | |
|--------|---|
| 58 | Class ID is “58”. This is used for internal references. |
| Year 9 | Name of the class |
| Y | Class complete status. Always use “Y”. |

Student

Every student in the “student” section belongs to at least one class from the “Class” section. Each row refers to one student

```
SECTION,Student,ROWS,4
111031,1234567899,Beer,Anita,7,F,1,111
111064,1234567901,Carmichealson,Annika,6,F,1,111
111027,1234575432,Cincinnati,Sachin,7,M,2,111
111041,2345676543,Great,Charles,7,M,1,211
```

SECTION,Student,ROWS,4 – “4” students in the “Student” section

There are 4 students each of which has a uniquely identifying number followed by the surname, first name, **Current Year Level**, student gender, English @ home, Ethnicity.

Example: NSN Included.

| | |
|------------|--|
| 111031 | Student ID is “111031”. This is the SMS_ID that uniquely identifies the student within the school. |
| 1234567899 | The NSN assigned to this student. |
| Beer | Surname of the student with ID 111031 |
| Anita | First name of the student with ID 111031 |
| 7 | Current Year Level |
| F | Student Gender is female |
| 1 | English spoken at home code is “1”. 1 = English Spoken @ Home |
| 111 | Ethnicity code is “111”. 111 = NZ European |

Student_Class

Student is related to a class in the “Student_Class” section. This section must be present if there is a “Student” section.

```
SECTION,Student_Class,ROWS,6
111027,1234575432,58
111031,1234567899,58
111041,2345676543,58
111031,1234567899,59
111041,2345676543,59
111064,1234567901,59
```

SECTION,Student_Class,ROWS,6 – “6” student class allocation in the “Student_Class” section

There are 6 students to class allocation to relate each student to an assigned class. The student ID and/or NSN uniquely identifies student and Class ID (not class name) uniquely identifies class. Note that the number of rows in the “Student_Class” section may be more than the number of student since students may be assigned to more than one class, for example, students are in separate classes for English and Mathematics.

Example: NSN Included and Member of Two Classes.

| | |
|------------|---|
| 111031 | Student ID is 111031 |
| 1234567899 | NSN for this Student |
| 58 | Student 111031 is assigned to the class ID “58” with the name Year 9 |
| | |
| 111031 | Student ID is 111031 |
| 1234567899 | NSN for this Student |
| 59 | Student 111031 is assigned to the class ID “59” with the name Class 9YN |

Note that the student with ID “111031” is assigned to both class “58” and class ”59” i.e. class “Year 9” and “Class 9YN”, since 58 refers to Year 9 and 59 refers to Class 9YN. Do NOT use the name of the class; use the export class id value.

Example: NSN Included and Member of One Class.

| | |
|------------|---|
| 111064 | Student ID is 111064 |
| 1234567901 | NSN for this Student |
| 58 | Student 111064 is assigned to the class ID “59” with the name Class 9YN |

Note that the student with ID “111064” is assigned to class “58“ only

Footer

This section **must** always be present at the end of the file.

SECTION,Footer

sample2.ast – End of the file “sample2.ast”. This must match the file name in the header section.

Document History

| Version | Date | Author | Description |
|---------|-------------------|------------------|--|
| 0.1 | 6 June 2007 | Andrea MacKay | Initial Draft |
| 0.2 | 1 July 2007 | Andrea MacKay | Updated after MoE advised that student demographic data will now be uploaded (rather than just class/group information). |
| 1.0 | 12 July 2007 | Annette Holt | Finalising for Change Request 019 (Version 4). |
| 1.1 | 17 July 2007 | Andrea MacKay | Revising in light of changes from Change Request 019 (Version 5) |
| 1.2 | 24 July 2007 | Andrea MacKay | Clarifying the Cluster Code. |
| 1.3 | 30 July 2007 | Andrea MacKay | Removing cluster codes. |
| 1.4 | 5 August 2007 | Andrea MacKay | Finalising. |
| 1.4 | 22 August 2007 | Sucheta Sharma | Revisions following multi-party discussion |
| 1.5 | 13 September 2007 | Paul Seiler | Suggested changes |
| 1.6 | 25 September 2007 | Jason R Briggs | Tidy up some of the column name definitions to be more consistent. Fix minor (change tracking) issues with text not deleted though it should've been. |
| 1.7 | 16 October 2007 | Jason R Briggs | Incorporating changes from Ministry. |
| 1.8 | 18 October 2007 | Andrea MacKay | Few minor modifications (i.e., removing comma after school number etc) |
| 2.0 | 30 October 2007 | Paul Seiler | Minor layout change and published |
| 2.1 | 7 November 2007 | Charu Rajakumar | Added Appendix B on Page 15 to list the allowed characters |
| 2.2 | 8 November 2007 | Charu Rajakumar | Corrected school_master_ID to be 4 numeric characters |
| 2.3 | 13 November | Annette Holt | Removed Appendix B |
| 2.3 | 14 November | Charu Rajakumar | Updated gender to be mandatory Removed Appendix A Section 1(a) – Page 2 - Included note to say that all ASCII control characters are not permitted. |
| 2.4 | 15 November | Paul Seiler | Prohibit commas in fields |
| 2.5 | 16 November | Paul Fraser | Further clarification re: non-allowable characters Replaced Appendix A Minor formatting changes |
| 3.0 | 21 August 2008 | Charu Rajakumar | Updated notes on Funding Year Level on Page 6 to accept Years 1 to 13 to cater for e-asTTle Numeracy Project Assessments |
| 3.1 | 18 September | Charu Rajakumar | Added clarifications to Funding Year Level on Page 6. |
| 3.2 | 24 September | Charu Rajakumar | Reworded notes on Funding Year Level on Page 6 as per suggestions from MoE |
| 3.3. | 13 August 2009 | Chariebel Enerio | Updated as per suggestions/review from MoE: We are using one ethnicity using the DMU code. Changing the column names based on the 2009 Roll Return and e-Returns Specification Manual (Version 15.2). |
| 3.4 | 20 August 2009 | Chariebel Enerio | Updated as per suggestions/review from MoE: Changed the column name ethnicity to ethnic1. |

| | | | |
|-----|---------------------|------------|--|
| 3.5 | 19 December 2013 | Nick Oakes | References to Funding Year Level field updated to reflect new title 'Current Year Level' |
|-----|---------------------|------------|--|

Appendix A

The following is a complete list of characters that must not be present in any finalised *.ast* file:

| Decimal | Octal | Hex | Binary | Value | Description |
|---------|-------|-----|----------|-------|----------------------------------|
| 000 | 000 | 000 | 00000000 | NUL | Null char. |
| 001 | 001 | 001 | 00000001 | SOH | Start of Header |
| 002 | 002 | 002 | 00000010 | STX | Start of Text |
| 003 | 003 | 003 | 00000011 | ETX | End of Text |
| 004 | 004 | 004 | 00000100 | EOT | End of Transmission |
| 005 | 005 | 005 | 00000101 | ENQ | Enquiry |
| 006 | 006 | 006 | 00000110 | ACK | Acknowledgment |
| 007 | 007 | 007 | 00000111 | BEL | Bell |
| 008 | 010 | 008 | 00001000 | BS | Backspace |
| 011 | 013 | 00B | 00001011 | VT | Vertical Tab |
| 012 | 014 | 00C | 00001100 | FF | Form Feed |
| 014 | 016 | 00E | 00001110 | SO | Shift Out |
| 015 | 017 | 00F | 00001111 | SI | Shift In |
| 016 | 020 | 010 | 00010000 | DLE | Data Link Escape |
| 017 | 021 | 011 | 00010001 | DC1 | XON Device Control 1 |
| 018 | 022 | 012 | 00010010 | DC2 | Device Control 2 |
| 019 | 023 | 013 | 00010011 | DC3 | XOFF Device Control 3 |
| 020 | 024 | 014 | 00010100 | DC4 | Device Control 4 |
| 021 | 025 | 015 | 00010101 | NAK | Negative Acknowledgement |
| 022 | 026 | 016 | 00010110 | SYN | Synchronous Idle |
| 023 | 027 | 017 | 00010111 | ETB | End of Trans. Block |
| 024 | 030 | 018 | 00011000 | CAN | Cancel |
| 025 | 031 | 019 | 00011001 | EM | End of Medium |
| 026 | 032 | 01A | 00011010 | SUB | Substitute |
| 027 | 033 | 01B | 00011011 | ESC | Escape |
| 028 | 034 | 01C | 00011100 | FS | File Separator |
| 029 | 035 | 01D | 00011101 | GS | Group Separator |
| 030 | 036 | 01E | 00011110 | RS | Request to Send Record Separator |
| 031 | 037 | 01F | 00011111 | US | Unit Separator |
| 127 | 177 | 07F | 01111111 | DEL | delete |