COMPATIBLE KISS

The "Keep It Simple, Steel" (*KISS*) Standard

**A standard Electronic Data Interchange (EDI) format
for the exchange of Bill of Material (BOM) information
within the steel fabrication industry**

Updated in March 2005

With enhancements for Version 1.1

Table of Contents

Overview

The purpose of this specification is to provide a simple means of communicating management information data between dissimilar software products within the steel fabrication industry. The specification provides a standard Electronic Data Interchange (EDI) format for the exchange of Bill of Material (BOM) information.

- **Bill of Materials Transfer Format (KISS)** listings, including Sequencing, Labor, and CNC instructions. This data transfer would typically be between a CAD system and an MIS system, or between one MIS system and another.

Contact Details

KISS ("Keep It Simple, Steel") is a public-domain standard established by FabTrol Systems. For more information visit the web site: http://www.steelkiss.org, contact us:

> FabTrol Systems, Inc.
> 1 E Broadway, Suite 100
> Eugene, OR 97401
> Sales: (888) FABTROL
> Support: (541) 345-1494
> E-mail: support@fabtrol.com

The Bill of Materials Transfer Format (KISS)

The KISS file format is a comma delimited ASCII text file used for transferring bill of materials data. It is named using the .KSS file extension to ensure recognition.

It consists of an identification line containing a KISS identifier, version number, and the name of the software product which created the file.

- The id line can be followed by an optional header line containing certain specifications about the job, such as job number, job name, etc.
- Optional address lines can contain the name, address and phone numbers of key players on the project, such as the owner, engineer, and the site.
- Detail lines may occur in unlimited numbers, containing fields such as quantity, type, size and length.
- Optional labor lines specify an unlimited number of labor functions required to produce each detail line.
- Optional sequencing lines specify what quantities should be assigned to an unlimited number of sequences.
- Optional CNC data can also be passed, to be stored and retrieved at an appropriate time during production control.

Note that the file is designed in sequential order. For example, any Labor, Sequencing, or CNC Data lines will be assumed to be attached to the previous Detail line.

No line should be longer than 254 characters.

All dates should be displayed in MM/DD/YY format.

KISS Version 1.1

The KISS standard has been extended with the release of Version 1.1.

The additions in this new version are as follows:
- A new drawing line ('W') has been created to store more information about the drawing such as title and date.
- A new assembly line ('M') has been created to store more additional information for the assembly mark such as the assembly name and cost code.
- The detail line ('D') has been extended to include the part name and cost code.
- The sequence line ('S') has been extended to include the lot name.

KISS Version 1.0

This is the original version of the KISS standard. The file should be laid out as follows:

File Identification Line ('KISS')

This line is mandatory.

This must be the first line in the KISS file; its purpose is to identify the file as being in a KISS format.

Field	Req'd	Value	Type	Length	Comments
Line identifier	Yes	KISS	C	4	To identify the file format, the first four characters of the first line of a KISS file must read "KISS"
Version number	Yes	1.0	C	4	The Version number of this KISS file, currently 1.0
Generating software	No		C	244	The name of the software product which produced the file.

Header Line ('H')

This line is mandatory.

Only a single header record will be accepted for any KISS file.

Field	Req'd	Value	Type	Length	Comments
Line identifier	Yes	H	C	1	
Job # [1]	Yes		C	8	
Job name[2]	No		C	50	
Customer name	No		C	40	
Created date	No		C	8	Date file was created
Created time	No		C	8	Time file was created, format hh:mm:ss
Metric[3]	Yes		L	1	
File Type[4]	No		C	20	

Address Line ('A')

This line is optional.

There can be a single address line ('A') containing a limited number of addresses for key players on the project.

Field	Req'd	Value	Type	Length	Comments
Line identifier	Yes	A	C	1	
Description[5]	No		C	10	
Name	No		C	40	
Mailing Address	No		C	40	
Mailing City	No		C	20	
Mailing State/Province	No		C	2	
Mailing Country	No		C	20	
Mailing Postal Code	No		C	10	
Shipping Address	No		C	40	
Shipping City	No		C	20	
Shipping State/Province	No		C	2	
Shipping Country	No		C	20	
Shipping Postal Code	No		C	10	
Phone Number	No		C	13	
Fax Number	No		C	13	
Pager Number	No		C	13	
E-Mail Address	No		C	50	
Contact	No		C	20	

Detail Line ('D')

This line is mandatory.
There can be an unlimited number of detail lines.

Field	Req'd	Value	Type	Length	Comments
Line identifier	Yes	D	C	1	
Drawing no	Yes		C	16	
Drawing revision ref	No		C	2	
Assembly mark[6]	Yes		C	16	
Part mark[7]	Yes		C	16	
Quantity[8]	Yes		N	4	
Type of material[9]	Yes		C	3	
Size of material[10]	Yes		C	24	
Grade[11]	Yes		C	8	
Length[12]	Yes		N	9.2	
Finish[13]	No		C	24	
Notes[14]	No		C		Notes up to a total line length of 254

Labor Line ('L')

This line is optional.
There can be an unlimited number of Labor records[15] for each detail record.

Field	Req'd	Value	Type	Length	Comments
Line identifier	Yes	L	C	1	
Labor type	Yes		C	15	
Quantity	Yes		N	6	
Size1	Yes		N	9.2	
Size2	Yes		N	9.2	
Notes	No		C	40	

Sequence Line ('S')

This line is optional.
There can be an unlimited number of sequence records for each detail record.

Field	Req'd	Value	Type	Length	Comments
Line identifier	Yes	S	C	1	
Sequence[16]	Yes		C	10	
Quantity	Yes		C	4	

ABM Line ('A')

This line is optional.

There can be an unlimited number of ABM records for each detail record.

Field	Req'd	Value	Type	Length	Comments
Line identifier	Yes	A	C	1	
ABM code[17]	Yes		C	16	

CNC Data Line ('C')

This line is optional.

There can be an unlimited number of CNC Data records for each detail record.

Field	Req'd	Value	Type	Length	Comments
Line identifier	Yes	A	C	1	
CNC data	Yes		C	254	An ASCII string[18]

Comment Lines ('*')

This line is optional.

Unlimited comment lines can appear anywhere within the file, except the first line.

Field	Req'd	Value	Type	Length	Comments
Line identifier	Yes	*	C	1	
Comment	No		C	254	

Note: The first character of each record should be followed by a comma, making the defining character a separate field. For example, a Detail record would begin with "D," followed by the data in comma-delimited fields.

The KISS standard being flexible and expandable, other information can be stored in it as necessary. Any record which begins with a character not defined above will be ignored by standard conversion programs unless and until the standard has been modified.

KISS Version 1.1

This is the updated version of the KISS standard. The file should be laid out as follows:

File Identification Line ('KISS')

This line is mandatory.

This must be the first line in the KISS file; its purpose is to identify the file as being in a KISS format.

Field	Req'd	Value	Type	Length	Comments
Line identifier	Yes	KISS	C	4	To identify the file format, the first four characters of the first line of a KISS file must read "KISS"
Version number	Yes	1.1	C	4	The Version number of this KISS file, currently 1.1
Generating software	No		C	244	The name of the software product which produced the file.

Header Line ('H')

This line is mandatory.

Only a single header record will be accepted for any KISS file

Field	Req'd	Value	Type	Length	Comments
Line identifier	Yes	H	C	1	
Job # [19]	Yes		C	8	
Job name[20]	No		C	50	
Customer name	No		C	40	
Created date	No		C	8	Date file was created, mm/dd/yy
Created time	No		C	8	Time file was created, format hh:mm:ss
Metric[21]	Yes		L	1	
File Type[22]	No		C	20	

Address Line ('A')

This line is optional.

There can be a single address line ('A') containing a limited number of addresses for key players on the project.

Field	Req'd	Value	Type	Length	Comments
Line identifier	Yes	A	C	1	
Description[23]	No		C	10	
Name	No		C	40	
Mailing Address	No		C	40	
Mailing City	No		C	20	
Mailing State/Province	No		C	2	
Mailing Country	No		C	20	
Mailing Postal Code	No		C	10	
Shipping Address	No		C	40	
Shipping City	No		C	20	
Shipping State/Province	No		C	2	
Shipping Country	No		C	20	
Shipping Postal Code	No		C	10	
Phone Number	No		C	13	
Fax Number	No		C	13	
Pager Number	No		C	13	
E-Mail Address	No		C	50	
Contact	No		C	20	

Detail Line ('D')

The detail line has been updated in v1.1
This line is mandatory.
There can be an unlimited number of detail lines.

Field	Req'd	Value	Type	Length	Comments
Line identifier	Yes	D	C	1	
Drawing no	Yes		C	30	
Drawing revision ref	No		C	5	
Assembly mark[24]	Yes		C	16	
Part mark[25]	Yes		C	16	
Quantity[26]	Yes		N	4	
Type of material[27]	Yes		C	3	
Size of material[28]	Yes		C	24	
Grade[29]	Yes		C	8	
Length[30]	Yes		N	9.2	
Finish[31]	No		C	24	
Notes[32]	No		C		Notes up to a total line length of 254
Part name	No		C	30	New field in v1.1 This is the name given to the part
Cost code category	No		C	6	New field in v1.1 This is a cost code assigned to the part. For a detail part, this will override the cost code on the assembly line.
Part weight[33]	No		N	7.2	New field in v1.1
Part net weight[34]	No		N	7.2	New field in v1.1
Part net area[35]	No		N	7.2	New field in v1.1

Drawing Line ('W')

This is a completely new line in v1.1

This line is optional.

There can be only 1 drawing line for each drawing number.

The drawing line must appear after the first detail line containing the same drawing no and before the detail line for the next drawing number.

Field	Req'd	Value	Type	Length	Comments
Line identifier	Yes	W	C	1	
Drawing no	Yes		C	30	Must match the drawing no field on the previous 'D' line
Drawing revision ref	No		C	5	Must match the drawing revision ref field on the previous 'D' line
Drawing title	No		C	30	The title for the drawing
Drawing date	No		C	8	Format mm/dd/yy. This is the drawing created date if the revision ref is blank, or the revised date if not
Drawn by	No		C	8	Name or initials of the person who created the drawing

Assembly Line ('M')

This is a completely new line in v1.1

This line is optional.

There can be only 1 assembly line for each assembly mark.

The assembly line must appear after the first detail line containing the same assembly mark and before the detail line for the next assembly mark.

Field	Req'd	Value	Type	Length	Comments
Line identifier	Yes	M	C	1	
Assembly mark	Yes		C	20	Must match the assembly mark field on the previous 'D' line
Assembly quantity	Yes		N	6	This is the total quantity of instances for the assembly mark.
Assembly name	No		C	30	The name given to the assembly
Assembly type	No		C	4	This is a code for the assembly type.
Assembly description	No		C	50	This is a description for the assembly type
Cost code category	No		C	6	This is the cost code assigned to the assembly. This code will be assigned to the detail parts unless a part has its own overridden cost code assigned.
Assembly weight[36]	No		N	7.2	This is the gross weight of a single assembly. This is the total weight for each part attached to the assembly.
Assembly net weight[37]	No		N	7.2	This is the net weight of a single assembly. This is the total net weight for each part attached to the assembly.
Assembly gross length[38]	No		N	7.2	This is the total length of the bounding box which contains the assembly.
Assembly gross depth[39]	No		N	7.2	This is the total depth of the bounding box which contains the assembly.
Assembly gross width[40]	No		N	7.2	This is the total width of the bounding box which contains the assembly.

Labor Line ('L')

This line is optional.
There can be an unlimited number of Labor records[41] for each detail record.

Field	Req'd	Value	Type	Length	Comments
Line identifier	Yes	L	C	1	
Labor type	Yes		C	15	
Quantity	Yes		N	6	
Size1	Yes		N	9.2	
Size2	Yes		N	9.2	
Notes	No		C	40	

Sequence Line ('S')

The sequence line has been updated in v1.1
This line is optional.
There can be an unlimited number of sequence records for each detail record.
The total quantity of the sequence records must equal the quantity of the assembly to which they relate.

Field	Req'd	Value	Type	Length	Comments
Line identifier	Yes	S	C	1	
Sequence[42]	Yes		C	10	
Quantity	Yes		N	4	
Lot name	No		C	16	New field in v1.1. When provided the qty refers to the qty of assemblies in the sequence and lot.

ABM Line ('A')

This line is optional.
There can be an unlimited number of ABM records for each detail record.

Field	Req'd	Value	Type	Length	Comments
Line identifier	Yes	A	C	1	
ABM code[43]	Yes		C	16	

CNC Data Line ('C')

This line is optional.
There can be an unlimited number of CNC data records for each detail record.

Field	Req'd	Value	Type	Length	Comments
Line identifier	Yes	A	C	1	
CNC data	Yes		C	254	An ASCII string[44]

Comment Lines ('*')

This line is optional.
Unlimited comment lines can appear anywhere within the file, except the first line.

Field	Req'd	Value	Type	Length	Comments
Line identifier	Yes	*	C	1	
Comment	No		C	254	

Note: The first character of each record should be followed by a comma, making the defining character a separate field. For example, a Detail record would begin with "D," followed by the data in comma-delimited fields.

The KISS standard being flexible and expandable, other information can be stored in it as necessary. Any record which begins with a character not defined above will be ignored by standard conversion programs unless and until the standard has been modified.

Endnotes

[1] The Job Number can be alphanumeric, up to eight characters long. It should consist of a legal DOS filename, thus excluding any characters not allowed in a DOS filename, such as "*, ?, /, <" etc.

[2] The Job Name is a fuller description of the job, such as "Costco Store #123".

[3] The Metric field is a logical specifying whether the Material Size description will be for Metric or Imperial sizes. It should be either T (True) if Metric sizes will be specified or F (False) if Imperial sizes will be specified.

[4] The File Type describes what kind of file is being transferred. Acceptable File Types include Estimate, Advanced Bill, Final Bill, Revised Bill, or Change Order

[5] Address Descriptions specify which address is being passed. Acceptable Descriptions include Owner, Architect, Engineer, General (as in General Contractor), Erector, and Job Site.

[6] A ship mark, or assembly mark, identifies a shippable piece. Typically a number indicates the start of a ship mark. This semi-standard is optional and may vary from user to user. NOTE: Although the specification allows up to 16 characters, not all software will support this length of field.

[7] A typical piece mark begins with any other character other than a number. This semi-standard is optional and may vary from user to user. Piece marks should be listed sequentially after the ship mark to which they will be attached. The quantity of piece marks should be the total quantity required, not the quantity required per ship mark. NOTE: Although the specification allows up to 16 characters, not all software will support this length of field. For example, the FabTrol System accepts a maximum of 8 usable characters.

[8] Quantity is the number of pieces required. Note that for detail parts, the quantity passed should be the total quantity required, not just the quantity required for this ship mark. For example, if a ship mark consisted of beam and four clip angles and ten of this ship mark were required, the first detail record would list a quantity of 10 beams, while the second detail record would list a quantity of 40 clip angles.

[9] The Type field requires a shape or item code, such as W for wide flange, PL for plate, AB for anchor bolt, and so on. The following codes are recognized by FabTrol Systems. Other codes may be defined by the user.

AB = Anchor Bolts
AR = AR Plate
C = Channel Iron
CP = Checkered Plate
CR = Cold Rolled Shafting
FB = Flat Bars
H = H-Pile Beams
HS = High Strength Bolts
L =Angle Iron
M = M Beams
MB = Machine Bolts
MC = Misc (Ship) Channel Iron
MI = Miscellaneous (Any undefined materials)
PI = Pipe
PL = Plate
PV = Pressure Vessel Plate
RB = Round Bars
S = S-Beams
SQ = Square Bars
ST = S-Tees
T1 = T-1 Plate
HSS = Tube Steel
UM = UM Plate
W = Wide Flange Beams
WA = Wedge Anchors (Concrete Anchors)
WS = Weld Studs
WT = W-Tees

[10] The Size field should contain standard AISC designations for steel shapes. It should accept either the imperial or the metric designation. Use of capital or small letters and spacing should not affect the results. For example:

Angle Iron:	L 3x 3x1/4 (imperial) or L 75x75x6 (metric)
Anchor Bolts:	AB 3/4x 12 (diameter & length) or
	AB 3/4x 12x 3x 2 (diameter & length, plus optional hook & thread)
Channel Iron:	C 6x 8.2
Flat Bar:	FB 1/2x 3-1/2
Machine Bolts:	MB 3/4x 2-3/4 (Note that the Grade field could optionally contain "A307".)
High Strength Bolts:	HS 3/4x 2-3/4 (Note that the Grade field would typically contain "A325".)
Nuts:	MB 3/4" NC NUTS (National Course)
Washers:	MB 3/4" FW (Flat Washer) or MB 3/4" CW (Cut Washer)
	NOTE: for machine bolts, high strength bolts, nuts, and washers, you may optionally specify "Shop" or "Field" in the Notes field.
Pipe:	PI 3" Std
	PI 3" XS or
	PI 3" Sch 40
Plate:	PL 1/2 x 24 or
	PL 2-1/2 x 24 (thickness and width)
Square Bar:	SQ 1/2
Tube Steel:	HSS 3x 3x .250 (wall thickness in decimals)
Wide Flange Beam:	W 12x40

[11] ASTM Grade designations are optional. If no grade is passed, A36 is assumed for all steel, Grade 50 for all pipe.

[12] Length should be in millimeters and tenths of millimeters. This avoids the eccentricities of Kings English dimensioning. The receiving program can sort the length into whatever format is desired. By extending to two decimal places, we assure ample accuracy when converting to fractions of an inch.

[13] The optional Finish field can contain a description of the paint or other coating specification required for the piece being defined. There must be a correlation between the sending software and the receiving software of what these descriptions represent in order for this field to be of use.

[14] Use of the Notes is optional. It is desirable to include any information which will aid the fabricator in producing the job. For example, simple definitions of what the piece is, such as "Beam", "Column", or "Base Plate" would be useful. If the piece is to be curved, inclusion of a note such as "Curve to 24' radius" would be useful.

[15] Labor Type codes should plainly specify the processes which must be performed to the previous detail record. Note that labor for a main mark is not accumulated from following minor marks. Instead, the labor which relates directly to a main mark, such as cutting a beam, is listed after the main mark, while the labor which relates directly to a minor mark, such as cutting, holes, or welding, is listed after the minor mark. Codes recognized by FabTrol are listed below. Other codes can be defined as necessary.

Code	*Description*
Cuts	The Quantity field should specify the number of Cuts required per piece. The Size1 and Size2 fields are unused. The receiving software will determine whether the cuts should be performed by a Saw, a Shear, or by some other method.
Holes	The Quantity field should specify the number of Holes required per piece. The Size1 field should specify the diameter of the hole, in millimeters to two decimals. The Size2 field should specify the thickness of the material. The Note field should specify the type of hole: Round, Square, Slotted, or Countersunk. If unspecified, the assumption shall be Round holes. The receiving software will determine whether the holes should be drilled, punched, or burned.
Copes	The Quantity field should specify the number of Copes to be made per piece. The Size1 field should specify the length of web cut. The Size2 field should specify the length of the flange cut. The receiving software will determine whether the cope should be burned by hand or by a CNC profiler.
Camber	The Quantity field should specify the number of Cambers required per piece (typically 1). The Size1 field should specify the depth of the Camber.
Burn	The Quantity field should contain the number of Burns to be made per piece (typically 1, except in a case where several holes are to be burned in a part). The Size1 field should contain the length of

	the burn in millimeters, with two decimals. The Size2 field should contain the thickness in millimeters, with two decimals. The Note field should specify whether the Burns are in "Web" or "Flange", where applicable. The receiving software will determine whether the part should be burned by hand, by a CNC burn table or some other process.
Weld	The Quantity field should contain the number of Welds required of this definition per piece. The Size1 field should contain the length of the weld in millimeters, with two decimals. The Size2 field should specify the Size of the Weld, in millimeters, with two decimals. The Notes field should contain a description of the weld profile, such as "Fillet", "Flat", or "Full Pen". If not specified, or for unrecognized descriptions, weld profile will default to a user-defined preference.
Other	For any undefined Labor Operation, the assumption shall be that the Quantity field represents the quantity of Operations required per piece and that the Size1 field shall contain the thickness (if applicable) and the Size2 field shall contain the length (if applicable).

NOTE: the order in which Labor, Sequence, and CNC records appear is not critical within themselves, as long as all of these records appear after the related Detail record and before the subsequent Detail record.

[16] The Sequence can be an alphanumeric entry representing the sequence number. A job may be sequenced to an unlimited number of sequences. If the sum of the quantities sequenced exceeds the total quantity for the line item, the excess quantity will be ignored. Sequencing data should be applied to main members only. Sequencing data applied to sub-members will be ignored. NOTE: although the specification allows up to 10 characters, not all software will support this length of field. For example, the FabTrol System accepts a maximum of 3 usable characters.

NOTE: the order in which Labor, Sequence, and CNC records appear is not critical within themselves, as long as all of these records appear after the related Detail record and before the subsequent Detail record.

[17] The Advanced Bill of Materials number is a unique alphanumeric number which identifies the relationship between Advanced Bills of Materials and the final detailed Bill of Materials. Since there may be several ABM numbers for one final Mark number, or several final Mark numbers generated from a single ABM number, we allow multiple ABM numbers for each Detail record.

[18] CNC data can be passed, one command at a time, as a series of ASCII strings separated by CHR(13) carriage returns. The receiving program may store and/or edit this information and load the machines at the appropriate time during production control and tracking.

NOTE: the order in which Labor, Sequence, and CNC records appear is not critical within themselves, as long as all of these records appear after the related Detail record and before the subsequent Detail record.

[19] The Job Number can be alphanumeric, up to eight characters long. It should consist of a legal DOS filename, thus excluding any characters not allowed in a DOS filename, such as "*, ?, /, <" etc.

[20] The Job Name is a fuller description of the job, such as "Costco Store #123".

[21] The Metric field is a logical specifying whether the Material Size description will be for Metric or Imperial sizes. It should be either T (True) if Metric sizes will be specified or F (False) if Imperial sizes will be specified.

[22] The File Type describes what kind of file is being transferred. Acceptable File Types include Estimate, Advanced Bill, Final Bill, Revised Bill, or Change Order

[23] Address Descriptions specify which address is being passed. Acceptable Descriptions include Owner, Architect, Engineer, General (as in General Contractor), Erector, and Job Site.

[24] A ship mark, or assembly mark, identifies a shippable piece. Typically a number indicates the start of a ship mark. This semi-standard is optional and may vary from user to user. NOTE: Although the specification allows up to 16 characters, not all software will support this length of field.

[25] A typical piece mark begins with any other character other than a number. This semi-standard is optional and may vary from user to user. Piece marks should be listed sequentially after the ship mark to which they will be attached. The quantity of piece marks should be the total quantity required, not the quantity required per ship mark. NOTE: Although the specification allows up to 16 characters, not all software will support this length of field. For example, the FabTrol System accepts a maximum of 8 usable characters.

[26] Quantity is the number of pieces required. Note that for detail parts, the quantity passed should be the total quantity required, not just the quantity required for this ship mark. For example, if a ship mark consisted of beam and four clip angles and ten of this ship mark were required, the first detail record would list a quantity of 10 beams, while the second detail record would list a quantity of 40 clip angles.

[27] The Type field requires a shape or item code, such as W for wide flange, PL for plate, AB for anchor bolt, and so on. The following codes are recognized by FabTrol Systems. Other codes may be defined by the user.

AB = Anchor Bolts
AR = AR Plate
C = Channel Iron
CP = Checkered Plate
CR = Cold Rolled Shafting
FB = Flat Bars
H = H-Pile Beams
HS = High Strength Bolts
L =Angle Iron
M = M Beams
MB = Machine Bolts
MC = Misc (Ship) Channel Iron
MI = Miscellaneous (Any undefined materials)
PI = Pipe; PL = Plate
PV = Pressure Vessel Plate
RB = Round Bars
S = S-Beams
SQ = Square Bars
ST = S-Tees
T1 = T-1 Plate
HSS = Tube Steel
UM = UM Plate
W = Wide Flange Beams
WA = Wedge Anchors (Concrete Anchors)
WS = Weld Studs
WT = W-Tees

[28] The Size field should contain standard AISC designations for steel shapes. It should accept either the imperial or the metric designation. Use of capital or small letters and spacing should not affect the results. For example:

Angle Iron:	L 3x 3x1/4 (imperial) or L 75x75x6 (metric)
Anchor Bolts:	AB 3/4x 12 (diameter & length) or
	AB 3/4x 12x 3x 2 (diameter & length, plus optional hook & thread)
Channel Iron:	C 6x 8.2
Flat Bar:	FB 1/2x 3-1/2
Machine Bolts:	MB 3/4x 2-3/4 (Note that the Grade field could optionally contain "A307".)
High Strength Bolts:	HS 3/4x 2-3/4 (Note that the Grade field would typically contain "A325".)
Nuts:	MB 3/4" NC NUTS (National Course)
Washers:	MB 3/4" FW (Flat Washer) or MB 3/4" CW (Cut Washer)
	NOTE: for machine bolts, high strength bolts, nuts, and washers, you may optionally specify "Shop" or "Field" in the Notes field.
Pipe:	PI 3" Std
	PI 3" XS or
	PI 3" Sch 40
Plate:	PL 1/2 x 24 or
	PL 2-1/2 x 24 (thickness and width)
Square Bar:	SQ 1/2
Tube Steel:	HSS 3x 3x .250 (wall thickness in decimals)
Wide Flange Beam:	W 12x40

[29] ASTM Grade designations are optional. If no grade is passed, A36 is assumed for all steel, Grade 50 for all pipe.

[30] Length should be in millimeters and tenths of millimeters. This avoids the eccentricities of Kings English dimensioning. The receiving program can sort the length into whatever format is desired. By extending to two decimal places, we assure ample accuracy when converting to fractions of an inch.

[31] The optional Finish field can contain a description of the paint or other coating specification required for the piece being defined. There must be a correlation between the sending software and the receiving software of what these descriptions represent in order for this field to be of use.

[32] Use of the Notes is optional. It is desirable to include any information which will aid the fabricator in producing the job. For example, simple definitions of what the piece is, such as "Beam", "Column", or "Base Plate" would be useful. If the piece is to be curved, inclusion of a note such as "Curve to 24' radius" would be useful.

[33] This is the gross weight of a single part. The weight will be measured in pounds (Lbs) for imperial imports and kilograms for metric imports

[34] This is the net or actual weight of a single part. The weight will be measured in pounds (Lbs) for imperial imports and kilograms for metric imports

[35] This is the net or calculated true area of a plate. Area will be measured in square feet (SF) for imperial and square metres (M^2) for metric.

[36] This is the gross weight of a single assembly. This is the total weight of each part attached to the assembly. The weight will be measured in pounds (Lbs) for imperial imports and kilograms for metric imports.

[37] This is the net weight of a single assembly. This is the total net weight for each part attached to the assembly. The weight will be measured in pounds (Lbs) for imperial imports and kilograms for metric imports.

[38] This is the total length of the bounding box which contains the assembly. The length will be measured in millimeters.

[39] This is the total depth of the bounding box which contains the assembly. The length will be measured in millimeters.

[40] This is the total width of the bounding box which contains the assembly. The length will be measured in millimeters.

[41] Labor Type codes should plainly specify the processes which must be performed to the previous detail record. Note that labor for a main mark is not accumulated from following minor marks. Instead, the labor which relates directly to a main mark, such as cutting a beam, is listed after the main mark, while the labor which relates directly to a minor mark, such as cutting, holes, or welding, is listed after the minor mark. Codes recognized by FabTrol are listed below. Other codes can be defined as necessary.

Code	*Description*
Cuts	The Quantity field should specify the number of Cuts required per piece. The Size1 and Size2 fields are unused. The receiving software will determine whether the cuts should be performed by a Saw, a Shear, or by some other method.
Holes	The Quantity field should specify the number of Holes required per piece. The Size1 field should specify the diameter of the hole, in millimeters to two decimals. The Size2 field should specify the thickness of the material. The Note field should specify the type of hole: Round, Square, Slotted, or Countersunk. If unspecified, the assumption shall be Round holes. The receiving software will determine whether the holes should be drilled, punched, or burned.
Copes	The Quantity field should specify the number of Copes to be made per piece. The Size1 field should specify the length of web cut. The Size2 field should specify the length of the flange cut. The receiving software will determine whether the cope should be burned by hand or by a CNC profiler.
Camber	The Quantity field should specify the number of Cambers required per piece (typically 1). The Size1 field should specify the depth of the Camber.
Burn	The Quantity field should contain the number of Burns to be made per piece (typically 1, except in a case where several holes are to be burned in a part). The Size1 field should contain the length of the burn in millimeters, with two decimals. The Size2 field should contain the thickness in millimeters, with two decimals. The Note field should specify whether the Burns are in "Web" or "Flange", where applicable. The receiving software will determine whether the part should be burned by hand, by a CNC burn table or some other process.
Weld	The Quantity field should contain the number of Welds required of this definition per piece. The Size1 field should contain the length of the weld in millimeters, with two decimals. The Size2 field should specify the Size of the Weld, in millimeters, with two decimals. The Notes field should contain a description of the weld profile, such as "Fillet", "Flat", or "Full Pen". If not specified, or for unrecognized descriptions, weld profile will default to a user-defined preference.
Other	For any undefined Labor Operation, the assumption shall be that the Quantity field represents the quantity of Operations required per piece and that the Size1 field shall contain the thickness (if applicable) and the Size2 field shall contain the length (if applicable).

NOTE: the order in which Labor, Sequence, and CNC records appear is not critical within themselves, as long as all of these records appear after the related Detail record and before the subsequent Detail record.

[42] The Sequence can be an alphanumeric entry representing the sequence number. A job may be sequenced to an unlimited number of sequences. If the sum of the quantities sequenced exceeds the total quantity for the line item, the excess quantity will be ignored. Sequencing data should be applied to main members only. Sequencing data applied to sub-members will be ignored. NOTE: although the specification allows up to 10 characters, not all software will support this length of field. For example, the FabTrol System accepts a maximum of 3 usable characters.

NOTE: the order in which Labor, Sequence, and CNC records appear is not critical within themselves, as long as all of these records appear after the related Detail record and before the subsequent Detail record.

[43] The Advanced Bill of Materials number is a unique alphanumeric number which identifies the relationship between Advanced Bills of Materials and the final detailed Bill of Materials. Since there may be several ABM numbers for one final Mark number, or several final Mark numbers generated from a single ABM number, we allow multiple ABM numbers for each Detail record.

[44] CNC data can be passed, one command at a time, as a series of ASCII strings separated by CHR(13) carriage returns. The receiving program may store and/or edit this information and load the machines at the appropriate time during production control and tracking.

NOTE: the order in which Labor, Sequence, and CNC records appear is not critical within themselves, as long as all of these records appear after the related Detail record and before the subsequent Detail record.