Capital Harness Systems™

Design System Interface (DSI) v10 File Specification

Capital Harness™ & Capital® Factory v2004.2

Last Updated: 13 December 2004

Change History

The following changes have been made to the DSI version 10 file structure from DSI version 9:

Date	Details
12/13/04	Added field 32 to section 5.

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Introductory Notes

New fields at the current release are added in green.

Fields marked with a red * are to be stored by DHD for re-export into Capital Manufacture. However, no processing is to be done on these fields in DHD.

Values marked in blue are the default value for fields of type ‘Specific Value’ and ‘Logical’

Note
The file import facility will still function for DSI files created to earlier standards.

Input File Structure

The main function of the Design System Interface facility is to read the contents of an ‘input file’ and to load the harness information into Capital Manufacture. In order to do this accurately and consistently, the input file needs to be properly organized. This chapter describes how the input file should be structured.

To Produce an Input File

In order to create an input file it is necessary to take the output from the CAD system (or to directly read the CAD model) and to re-organize the harness design information as described in this chapter. The re-structured data should be held in a separate file.

Overview of the Input File

The input file is a standard ASCII text file. The input file can be read by standard text editors of all popular operating systems, for example MS-DOS, Unix, VAX/VMS.

It is arranged into several ‘sections’, each of which is described in this chapter. Each section contains one or more ‘records’ - or lines - of information.

Each record of each section is made up of one or more ‘fields’. Every field is described in this chapter. The fields of the records are separated by a recognizable character, a ‘delimiter’.

Special Characters in the Input File

The input file has 3 characters that are nominated to be used for special purposes:

- Comment marker
- Section Separator
- Field delimiter

Note
In each case there is a default character however an alternative character can be used. Only one character can be chosen for each purpose. A different character must be used for each purpose.

Once nominated - in each of the three cases - the chosen character can only be used for its given purpose. For example if the asterisk character is chosen to be the delimiter, the system will always interpret it as a field delimiter.

Comment Marker, default - !

The program that processes the input file ignores every record that begins with the comment marker character.

Special notes can thus be inserted into an input file without affecting the Design System Interface module. These notes may be used as information for readers, or for use with another system.

Section Separator, default - %

The input file is arranged into several sections. The purpose of each section is described in this chapter.

The system recognizes where one section ends and another one begins when it sees the section separator character at the beginning of a record.

Note
A section separator is NOT placed before the start of the first section. If any section - as described below - is absent because it is not needed for a particular harness, two separators are still needed in the file, one for the start and one for the end. A concluding section separator is placed at the end of the input file.

Field Delimiter, default - :

The field delimiter separates each field of each record.

Note
A delimiter terminates each record.

Section Descriptions

The following is a section by section description of the structure of the file. Each field of each record is described along with any special information or requirements.

Summary of Sections

- Section 01: Harness Name and Issue Level
- Section 02: Special Text Information
- Section 03: Composite Harness Details
- Section 04: Branch Configuration
- Section 05: Wire Specifications
- Section 06: Components
- Section 07: Branch Insulations
- Section 08: Center Strips
- Section 09: Multicore Specifications
- Section 10: Module Child Details
- Section 11: Module Compatibility Table
- Section 12: Manual BOM Quantities
- Section 13: Composite Options
- Section 14: Wire Through Nodes
- Section 15: Branch Insulation Through Nodes
- Section 16: Mid Wire Components
- Section 17: Wire / Multicore Markers
- Section 18: Pin Mappings

The sections must be placed into the input file in the order described above.

The field ‘DSI’ in the table below denotes at which version the field was added to the DSI specification. Sections were added at the lowest version number of any of the fields in the section

Section 01: Harness Name and Issue Level

This section of the input file only requires one record.

Field no.	Field name	Type	Format	Description
1	Harness Name 1	Text	30 characters	First harness part no. (customer harness of exporting system)
2	Harness Issue 1	Text	30 characters	First harness issue level.
3	Harness Date 1	Date	DD/MM/YYYY	First harness drawing release date
4	File Version	Number		DSI file version number (currently 8)
5	Customer Name	Text	30 characters	Customer name
6	Harness Name 2	Text	30 characters	Second harness part no. (internal harness of exporting system)
7	Harness Issue 2	Text	30 characters	Second harness issue level
8	Harness Date 2	Date	DD/MM/YYYY	Second harness drawing release date
9	Similar Harness Name 1	Text	30 characters	First harness similar part no.
10	Similar Harness Issue 1	Text	30 characters	First harness similar issue level
11	Similar Harness Name 2	Text	30 characters	Second harness similar part no.
12	Similar Harness Issue 2	Text	30 characters	Second harness similar issue level
13	Site	Text	30 characters	Manufacturing site
14	Range	Text	30 characters	Model range
15	Board length	Number		Board length
16	Board width	Number		Board width
17	Datum	Specific Value		Harness datum value (‘Back’, ‘Front’ or ‘Terminal’)
18	User Field 1	Text	30 characters	Harness user field 1
19	User Field 2	Text	30 characters	Harness user field 2
20	User Field 3	Text	30 characters	Harness user field 3
21	User Field 4	Text	30 characters	Harness user field 4
22	User field 5	Text	30 characters	Harness user field 5
23	Checker	Text	20 characters	Checker of harness
24	Inputter	Text	20 characters	Inputter of harness
25	Draughtsman	Text	20 characters	Harness draughtsman
26	Prepared By	Text	20 characters	Harness preparation by
27	Type	Text	30 characters	Harness type
28	Title	Text	30 characters	Harness drawing title
29	Engine Size	Text	10 characters	Harness engine size
30	Manufacturing Cell	Text	30 characters	Manufacturing cell
31	Trim	Text	10 characters	Trim level
32	LR Hand	Specific Value		Left / Right hand (‘None’, ‘Left’ or ‘Right’)
33	Tube Add-On Type	Specific Value		Tube add-on type (‘Percentage’ or ‘Fixed’)
34	Tube Add-On Factor	Number		Tube add-on factor
35	Manual Terminal	Logical		Are all wires manually terminated? [no]
36	Sealed Connectors	Logical		Are all connectors sealed? [no]
37	Datum Node	Text	10 characters	Initial start node of branch configuration
38	Datum route	Text	10 characters	Initial start route of branch configuration

Field no.	Field name	Type	Format	Description
39	Module Type	Logical		Is this harness a module? [no]
40	Alpha Code	Text	30 characters	Harness alpha code, only set in Designer from 3.0a and above.
41	Use pitch tables	Logical		Should pitch tables be used for in-house twisted pair length calculation? [no]

Section 02: Special Text Information

All records (excluding those beginning with the comment marker) will be repeated in the exception report after the main harness details. This is a useful mechanism for communicating special notes that have been written by the designer.

Section 03: Composite Details

This section applies only to composite (family) drawings. No records should be included for other harness drawings.

Field no.	Field name	Type	Format	Description
1	Harness Name 1	Text	30 characters	First harness part no.
2	Harness Issue 1	Text	30 characters	First harness issue level.
3	Harness Date 1	Date	DD/MM/YYYY	First harness drawing release date
4	Customer Name	Text	30 characters	Customer name
5	Harness Name 2	Text	30 characters	Second harness part no.
6	Harness Issue 2	Text	30 characters	Second harness issue level
7	Harness Date 2	Date	DD/MM/YYYY	Second harness drawing release date
8	Similar Harness Name 1	Text	30 characters	First harness similar part no.
9	Similar Harness Issue 1	Text	30 characters	First harness similar issue level
10	Similar Harness Name 2	Text	30 characters	Second harness similar part no.
11	Similar Harness Issue 2	Text	30 characters	Second harness similar issue level
12	Site	Text	30 characters	Manufacturing site
13	Range	Text	30 characters	Model range
14	Board length	Number		Board length
15	Board width	Number		Board width
16	Datum	Specific Value		Harness datum value (‘Back’, ‘Front’ or ‘Terminal’)
17	User Field 1	Text	30 characters	Harness user field 1
18	User Field 2	Text	30 characters	Harness user field 2
19	User Field 3	Text	30 characters	Harness user field 3
20	User Field 4	Text	30 characters	Harness user field 4
21	User field 5	Text	30 characters	Harness user field 5
22	Checker	Text	20 characters	Checker of harness
23	Inputter	Text	20 characters	Inputter of harness

Field no.	Field name	Type	Format	Description
24	Draughtsman	Text	20 characters	Harness draughtsman
25	Prepared By	Text	20 characters	Harness preparation by
26	Type	Text	30 characters	Harness type
27	Title	Text	30 characters	Harness drawing title
28	Engine Size	Text	10 characters	Harness engine size
29	Manufacturing Cell	Text	30 characters	Manufacturing cell
30	Trim	Text	10 characters	Trim level
31	LR Hand	Specific Value		Left / Right hand ('None', 'Left' or 'Right')
32	Tube Add-On Type	Specific Value		Tube add-on type ('Percentage' or 'Fixed')
33	Tube Add-On Factor	Number		Tube add-on factor
34	Manual Terminal	Logical		Are all wires manually terminated? [no]
35	Sealed Connectors	Logical		Are all connectors sealed? [no]
36	Alpha Code	Text	30 characters	Harness alpha code, only set in Designer from 3.0a and above.
37	Circuit / Option	Text	30 characters	Circuit / option on this derivative. There may be zero, one or many of these fields **[this field must always be last in this section]**.

Section 04: Branch Configuration

Field no.	Field name	Type	Format	Description
1	Start Node	Text	10 characters	Name of node at start of branch. (reference name at file version 1)
2	Start Route	Text	30 characters	Customer's orientation / dress route code.
3	Start Co-ordinates	Text	x999y999z999 x999y999 999 999 999 999 999	Optional - Co-ordinates of branch start point.
4	End Node	Text	10 characters	Name of node at end of branch. (reference name at file version 1)
5	End Route	Text	30 characters	Customer's orientation / dress route code.
6	End Co-ordinates	Text	x999y999z999 x999y999 999 999 999 999 999	Optional - Co-ordinates of branch end point.
7	Length	Number		Branch length.
8	Circuit / Option	Text	30 characters	Circuit / Option for branch (if present)
9	Bundle Diameter	Number		Bundle diameter – this field is used by DESKTOP HARNESS DESIGN and is ignored by CAPITAL H
10	User Module	Text	30 characters	The module code defined by the user to override the module generated by module assignation
11	Assigned Module	Text	30 characters	The module code assigned by module assignation (this field may be left blank as it will be generated during module assignation)

Field no.	Field name	Type	Format	Description
12	Module From	Specific Value		The module code which is to be used ('Automatic', 'Manual' or 'Overridden') NOTE: If 'User Module' has a value then this field will default to 'Manual'
13	Bend String	Text	500 characters	The bend string used by CAPITAL H in Form Board Drawing. NOTE: This field is ignored by DSI import.
14	NOT USED			THIS FIELD IS NOT USED IN VERSION 5 DSI FILES
15	NOT USED			THIS FIELD IS NOT USED IN VERSION 5 DSI FILES
16	NOT USED			THIS FIELD IS NOT USED IN VERSION 5 DSI FILES
17	NOT USED			THIS FIELD IS NOT USED IN VERSION 5 DSI FILES
18	NOT USED			THIS FIELD IS NOT USED IN VERSION 5 DSI FILES
19	NOT USED			THIS FIELD IS NOT USED IN VERSION 5 DSI FILES
20	Bend	Text	x999y999z999 x999y999 999 999 999 999 999	Co-ordinates of a bend on the branch. There may be zero, one or many of these fields. **[this field must always be last in this section]**

Note

The reference names are not necessarily the required node names. They can be temporary links to other sections of the input file. Node naming is discussed in more detail later in this chapter.

Orientation / dress route codes are translated by the input processing program to internal route codes. If no translation is found a warning is given in the exception report and the customer code is used.

Section 05: Wire Specifications

Field no.	Field name	Type	Format	Description
1	Wire Name	Text	30 characters	Unique wire reference name / number.
2	Wire Option	Text	200 characters	Circuit / option for composites. If this is blank, ALL is assumed.
3	Wire Type	Text	30 characters	Customer code for wire type. Will be translated if present.
4	Color	Text	30 characters	Wire color code. Will be translated if present.
5	Cross Sectional Area	Number		Wire size. Either . or , can be used as the decimal symbol. Can be blank.
6	Material	Text	30 characters	Code for wire insulation material. Will be translated if present.
7	User Module	Text	30 characters	The module code for this wire. In previous versions, this field held the length.
8	Multicore Name	Text	30 characters	Unique multicore wire reference name / number if part of a multicore.
9	End 1 Node Name	Text	10 characters	Node at end 1 of wire. (reference name at file version 1)
10	End 1 Route	Text	10 characters	Customer code for dress / route of wire end.

Field no.	Field name	Type	Format	Description
11	End 1 Cavity	Text	10 characters	Cavity name. If blank this is set to X for a splice or 0 otherwise.
12	End 1 Material Code	Text	4 characters	Material code used at end 1 cavity for terminal selection.
13	End 2 Node Name	Text	10 characters	Node at end 2 of wire. (reference name at file version 1)
14	End 2 Route	Text	10 characters	Customer code for dress / route of wire end.
15	End 2 Cavity	Text	10 characters	Cavity name. If blank this is set to X for a splice or 0 otherwise.
16	End 2 Material Code	Text	4 characters	Material code used at end 2 cavity for terminal selection.
17	Include On BOM	Logical		Is the wire to be included on the bill of materials? [yes]
18	Include On Chart	Logical		Is the wire to be included on the wire cutting chart? [yes]
19	Wire Tag	Text	30 characters	Wire information. Will be placed in 'customer wire name' in CAPITAL H.
20	Wire Note	Text	100 characters	Note to be stored in the wire note field. *
21	Wire Length Change Type	Specific Value		Wire length change type ('Neither', 'Absolute' or 'Offset'). *
22	Wire Length Change Value	Number		CAPITAL H wire length change value for wire length, or value to be added to wire length. *
23	Assembly Item Number	Number		Assembly item number for wire part. Use if part of an Assembly Item
24	Multicore Option	Text	30 characters	The option for the multicore of which the wire is part (if left blank and the multicore only exists once in the DSI file then the option of the multicore will be assumed).
25	Unmodified wire lengt (Note: For export only; will be ignored by the DSI import)	Number		Wire length prior to Engineering Calculations.
26	Modified wire length (Note: For export only; will be ignored by the DSI import)	Number		Wire length after Engineering Calculations.

Field no.	Field name	Type	Format	Description
27	Cutback at end 1 (Note: For export only; will be ignored by the DSI import)	Number		Amount by which wire should be cut back at this end (applicable to multicore inner cores only).
28	Cutback at end 2 (Note: For export only; will be ignored by the DSI import)	Number		Amount by which wire should be cut back at this end (applicable to multicore inner cores only).
29	Part number 1	Character	30 characters	First part number of exporting system.
30	Part number 2 (Note: For import only. Will not be populated by DSI export)	Character	30 characters	Second part number of exporting system.
31	Part number 3 (Note: for import only. Will not be populated by DSI export)	Character	30 characters	Third part number of exporting system.
32	Signal	Character	30 characters	Signal name

Section 06: Components

Field no.	Field name	Type	Format	Description
1	Node Name	Text	30 characters	Node name. (reference name at file version 1)
2	Cavity Name	Text	30 characters	Blank unless this is a cavity component (e.g. a terminal or cavity seal).
3	Wire Name	Text	30 characters	Blank unless this is a wire end component (e.g. identification label). Wire name as it appear in the Wire Name field of Section 5.
4	Sequence Number	Text	30 characters	Used only for components spanning multiple locations. Used as specified if this is a number between 1 to 100, otherwise a number is generated.
5	Component Type Code	Text	See Below	Usually this is blank. See notes on component type codes below.
6	Circuit / Option	Text	30 characters	Usually this is blank. Only used with composite harnesses.
7	Service / Function	Text	30 characters	Optional description of the node location.
8	Route	Text	10 characters	Customer code for dress / route of this component.
9	Part Number 1	Text	30 characters	First part number (internal part of exporting system).
10	Quantity	Number		Quantity of this component at this location. If blank, 1 is assumed.
11	Cross Sectional Area	Number		Used when the component is a terminal or cavity seal and when the customer is restricting its use to a certain wire size. When used with Type Code, TERM or SEAL (see below) this information is used for component selection. It can be blank.
12	Part Number 2	Text	30 characters	Second part number (customer part of exporting system).
13	Part Number 3	Text	30 characters	Third part number (supplier apart of exporting system).
14	Select Terminal?	Logical		Is a terminal to be selected at this cavity? [no]
15	Seal?	Logical		NODE RECORD: Does this node have cavity seals? * [no] CAVITY RECORD: Is a cavity seal to be selected at this cavity [no]
16	Plugged?	Logical		Does this node have cavity plugs? * [no]
17	Block Number	Text	10 characters	Block number for the node. *
18	Termination Method	Specific Value		Termination method for this cavity ('System Calculated', 'Cut and Terminate' or 'Terminate Separately') . *
19	Material Code	Text	4 characters	Material code used at cavity for terminal selection.
20	Component Type Code	Text	4 characters	Component type used at cavity for terminal selection.
21	Insulation Type	Specific Value		Splice insulation type ('None', 'Heat Shrink Sleeve', 'Spot Tape') [NOTE – the default value is 'Heat Shrink Sleeve' for ultrasonic welds]
22	User Module	Text	30 characters	The module code defined by the user to override the module generated by module assignation
23	Assigned Module	Text	30 characters	The module code assigned by module assignation (this field may be left blank as it will be generated during module assignation)

Field no.	Field name	Type	Format	Description
24	Module From	Specific Value		The module code which is to be used ('Automatic', 'Manual' or 'Overridden') NOTE: If 'User Module' has a value then this field will default to 'Manual'
25	Split Value	Text	30 characters	Used to cross reference with section 12 of the DSI in order to split a component across 2 or more modules
26	Datum	Specific Value		Component datum value ('Default', 'Back', 'Front', 'Terminal')
27	Assembly Item Number	Number		Assembly item number for component part. Used for Assembly Items
28	Color Code	Text	4 characters	The color code used for IDC connector selection
29	Number Of Cavities	Number		The number of cavities used for IDC connector selection
30	Backshell	Logical		Does this node have cavity plugs? [no]

Note 1 - Special COMPONENT TYPE CODES

All branch insulation codes must be in section 7 (branch insulations). In this case 'component type codes' are only checked against the values in note 2.]

Component Type Codes are initially checked against Customer Branch Insulation Codes to see if the requirement is actually for spot tape or breakout tape. If so, the specified Part Number is translated and added as spot tape or breakout tape at the node. Breakout tape will only be added at a junction if this requirement has been set for the insulation code.

If the Type Code does not translate to a branch insulation code, a check is made to see if it matches one of the special codes shown in Note 2 below.

Note 2 - Special COMPONENT TYPE CODES

CODE	Description
SPLICE	This component is a splice. If a splice Part Number is also supplied it will be used. Otherwise a splice part number will be selected.
SOLSLV	This component is a solder sleeve. If a solder sleeve Part Number is also supplied it will be used. Otherwise a solder sleeve part number will be selected.
UWELD	This component is an ultrasonic weld. If a weld Part Number is also supplied it will be used. Otherwise a weld part number will be selected.
TERM	The customer Part Number will be translated to find a component with group 'Terminal'. If a cavity is supplied the internal part number will be added to that cavity. Otherwise it will be used for terminal selection at the specified node.
SEAL	The customer Part Number will be translated to find a component with group 'Cavity Seal'. If a cavity is supplied the internal part number will be added to that cavity. Otherwise it will be used for cavity seal selection at the specified node.
PLUG	The customer Part Number will be translated to find a component with group 'Cavity Plug'. The component will be used to select cavity plugs at the specified node.
GREASE	The component specified by the system parameter 'Default Grease Component' will be placed here. If the parameter 'Grease Application Method' is set to 'Node', one application will be placed at the node. If set to 'Cavity', one application will be placed in the cavity 'Grease' for each cavity of the main component.
CUTEND	This is a screen wire which is to be isolated. Generally the component specified by the system parameter 'Default Cut End Component' is added to the node. The

Note 2 - Special COMPONENT TYPE CODES	
CODE	**Description**
	specified component may be changed for any harness.
SCRTER	This is a screen wire that is to be terminated. Generally the component specified by the system parameter 'Default Screen Termination Component' is added to the node. The specified component may be changed for any harness.
CONNECTOR	Required for harness drawing
IDC	The component is an IDC connector
ASSEMBLYITEM	The component is an assembly item

Section 07: Branch Insulations

Field no.	Field name	Type	Format	Description
1	Start Node	Text	10 characters	Start node for branch insulation. (reference name at file version 1)
2	Start Route	Text	30 characters	Customer's orientation / dress route code.
3	End Node	Text	10 characters	End node for branch insulation. (reference name at file version 1) – will be blank if it is a piece of spot tape or breakout tape.
4	End Route	Text	30 characters	Customer's orientation / dress route code.
5	Piece Code	Text	30 characters	Insulation piece code (see below).
6	Insulation Code	Text	30 characters	Customer code for the branch insulation. This will be translated.
7	Diameter	Number		Inner diameter of the tube to be used (this may be blank).
8	Circuit/Option	Text	30 characters	The circuit / option name for the insulation
9	Insulation Note	Text	50 characters	The note against the branch insulation. *
10	User Module	Text	30 characters	The module code defined by the user to override the module generated by module assignation
11	Assigned Module	Text	30 characters	The module code assigned by module assignation (this field may be left blank as it will be generated during module assignation)
12	Module From	Specific Value		The module code which is to be used ('Automatic', 'Manual' or 'Overridden') NOTE: If 'User Module' has a value then this field will default to 'Manual'
13	Calculation Method	Specific Value		How are branch insulations to be calculated? ('System', 'Manual', 'Factored'). NOTE: This field will be ignored if the harness is not a module and also if the insulation is a tube..
14	Manual Amount	Number		The manually entered amount of tape. NOTE: This field will be ignored if the harness is not a module and also if the insulation is a tube.
15	Split Value	Text	30 characters	Used to cross reference with section 12 of the DSI in order to split a component across 2 or more modules
16	Join Number	Number		Used to determine which insulations need to be

Field no.	Field name	Type	Format	Description
				joined together.
17	Assembly Item Number	Number		Assembly item number for insulation part. Use if part of an Assembly Item
18	Layer	Number		The layer that the insulation has been assigned.
19	Insulation Type	Specific Value		What is the insulation tupe? ("Untaped", "Component", "Breakout Tape", "Mandatory Spot Tape", "Overlap Tape", "Space Tape", "Spiral Tape", "Spot Tape", "Fixed Tube", "Fixed Cut-back Tube", "Fixed Pulled-back Tube", "Selected Tube", "Selected Cut-back Tube", "Selected Pulled-back Tube" or "Water Hose")
20	Part Number 1	Text	30 characters	First part number (internal part of exporting system)
21	Part Number 2	Text	30 characters	Second part number (customer part of exporting system)
22	Part Number 3	Text	30 characters	Third part number (supplier part of exporting system)
23	Color	Text	4 characters	Insulation color code. Will be translated if present.
24	Type	Text	4 characters	Insulation type code. Will be translated if present.
25	Material	Text	4 characters	Insulation material code. Will be translated if present.
26	Wall Thickness	Number		Thickness of insulation.
27	Number of Turns	Number		Number of turns of tape.
28	Turns Per Breakout	Number		Number of turns of tape on the breakout (breakout tape only).
29	Turns Per Branch	Number		Number of turns of tape on each branch (breakout tape only).
30	Distance Between Items	Number		Distance between each application of space tape or between turns of spiral/overlap tape.
31	Longest Distance	Number		Longest distance without space tape.
32	Distance From Connector	Number		Distance of space tape away from a connector.
33	Tube Selection Type	Specific Value		How are tubes to be selected? ("Percentage" or "Fixed") NOTE: This field will be ignored if the insulation is not a selected tube.
34	Tube Selection Factor	Number		The amount that the tube should be greater than the bundle diameter (percentage or fixed value).
35	Cut Back	Number		Amount to cut back the tube, only to be used with cut-back tubes.
36	Convoluted	Logical		Is the tube convoluted [yes]
37	Slit	Logical		Is the tube slit [yes]
38	Module Specific Data	Character	30 characters	Depends on which custom modules are installed.

Note

The Insulation Piece Code is used to specify sections of tube (or tape) which are joined.

All insulations with the same Piece Code and Insulation Code will be joined. An error will be given if the insulations to be joined are not adjacent to one another.

If Piece Code is blank, all adjacent items of matching tape specification will be joined.

Identical tubes without Piece codes will be joined excluding unslit tubes that are separated by a junction.

Section 08: Center Strips

Field no.	Field name	Type	Format	Description
1	Node Name	Text	10 characters	Node containing the center strip. (reference name at file version 1)
2	Route	Text	30 characters	Customer's orientation / dress route code.
3	Wire Name	Text	30 characters	Wire name as it appear in the Wire Name field of Section 5 for the center-stripped wire.
4	Strip Length	Number		The length of insulation to be stripped. If this is blank the value specified by the system parameter 'Default Center-Strip Length' will be used.
5	Length Change Type	Specific Value		CAPITAL H length change type ('Neither', 'Absolute' or 'Offset'). *
6	Length Change Value	Number		Absolute length of change or amount to be added to value (may be negative). *
7	Option	Text	30 characters	The option for the wire having the center strip NOTE: If this is left blank and there is only one wire with the name in field 1 then the option against that wire will be used.
8	Through Order	Number		The order number within the wire through nodes list. If blank then this will be the order number for this node/wire/option combination (if it is unique), otherwise it will be left as 0 and a warning given

Section 09: Multicore Specifications

Field no.	Field name	Type	Format	Description
1	Multicore Name	Text	30 characters	Unique multicore wire reference name / number if part of a multicore.
2	Include Multicore On BOM	Logical		Is the multicore to be included on the bill of materials? [yes]
3	Include Multicore On Chart	Logical		Is the multicore to be included on the wire cutting chart? [yes]
4	Multicore Tag	Text	30 characters	Multicore information. Will be placed in 'customer multicore name' in CAPITAL H.
5	Multicore Note	Text	100 characters	Note to be stored in the multicore note field. *
6	Multicore Length Change Type	Specific Value		CAPITAL H multicore length change type ('Neither', 'Absolute' or 'Offset'). *
7	Multicore Length Change Value	Number		Absolute length of change or amount to be added to value (may be negative). *
8	Outer Sheath Cut Back At End 1 Type	Specific Value		CAPITAL H outer sheath length change type ('Neither', 'Absolute' or 'Offset'). *
9	Outer Sheath Cut Back At End 1 Value	Number		Absolute length of change or amount to be added to value (may

Field no.	Field name	Type	Format	Description
				be negative). *
10	Outer Sheath Cut Back At End 2 Type	Specific Value		CAPITAL H outer sheath length change type ('Neither', 'Absolute' or 'Offset'). *
11	Outer Sheath Cut Back At End 2 Value	Number		Absolute length of change or amount to be added to value (may be negative). *
12	Color	Text	30 characters	Multicore color code
13	Material	Text	4 characters	Multicore material code
14	Specification	Text	20 characters	Multicore outer sheath specification
15	Sheathed	Logical		Does the multicore have an outer sheath? [no]
16	User Module	Text	30 characters	The module code for this multicore
17	Assembly Item Number	Number		Assembly item number for insulation part. Use if part of an Assembly Item
18	Parent Multicore Name	Character		The name of the parent multicore
19	Multicore Option	Text	30 characters	The option for the multicore.
20	Parent Multicore Option	Text	30 characters	The option for the parent multicore (if left blank and the parent multicore only exists once in the DSI file then the option of the parent multicore will be assumed).
21	Unmodified multicore length (Note: For export only; will be ignored by DSI import)	Number		Multicore length prior to Engineering Calculations.
22	Modified multicore length (Note: For export only; will be ignored by the DSI import)	Number		Multicore length after Engineering Calculations.
23	Part number 1	Character	30 characters	First part number of exporting system.
24	Part number 2 (Note: for import only. Will not be populated by DSI export)	Character	30 characters	Second part number of exporting system.
25	Part number 3 (Note: for import only. Will not be populated by DSI export)	Character	30 characters	Third part number of exporting system.

Section 10: Module Child Details

Field no.	Field name	Type	Format	Description
1	Module Code	Text	30 characters	The code for the module child
2	Core Module	Logical		Is this module child a core module? [no]
3	Harness Name 1	Text	30 characters	First harness part no. (customer harness of exporting system)
4	Harness Issue 1	Text	30 characters	First harness issue level.
5	Harness Date 1	Date	DD/MM/YYYY	First harness drawing release date
6	Similar Harness Name 1	Text	30 characters	First harness similar part no.
7	Similar Harness Issue 1	Text	30 characters	First harness similar issue level

Field no.	Field name	Type	Format	Description
8	Harness Name 2	Text	30 characters	Second harness part no. (internal harness of exporting system)
9	Harness Issue 2	Text	30 characters	Second harness issue level
10	Harness Date 2	Date	DD/MM/YYYY	Second harness drawing release date
11	Similar Harness Name 2	Text	30 characters	Second harness similar part no.
12	Similar Harness Issue 2	Text	30 characters	Second harness similar issue level
13	Customer Name	Text	30 characters	Customer name
14	Site	Text	30 characters	Manufacturing site
15	Range	Text	30 characters	Model range
16	Board length	Number		Board length
17	Board width	Number		Board width
18	Datum	Specific Value		Harness datum value ('Back', 'Front' or 'Terminal')
19	User Field 1	Text	30 characters	Harness user field 1
20	User Field 2	Text	30 characters	Harness user field 2
21	User Field 3	Text	30 characters	Harness user field 3
22	User Field 4	Text	30 characters	Harness user field 4
23	User field 5	Text	30 characters	Harness user field 5
24	Checker	Text	20 characters	Checker of harness
25	Inputter	Text	20 characters	Inputter of harness
26	Draughtsman	Text	20 characters	Harness draughtsman
27	Prepared By	Text	20 characters	Harness preparation by
28	Type	Text	30 characters	Harness type
29	Title	Text	30 characters	Harness drawing title
30	Engine Size	Text	10 characters	Harness engine size
31	Manufacturing Cell	Text	30 characters	Manufacturing cell
32	Trim	Text	10 characters	Trim level
33	LR Hand	Specific Value		Left / Right hand ('None', 'Left' or 'Right')
34	Tube Add-On Type	Specific Value		Tube add-on type ('Percentage', or 'Fixed')
35	Tube Add-On Factor	Number		Tube add-on factor
36	Manual Terminal	Logical		Are all wires manually terminated? [no]
37	Sealed Connectors	Logical		Are all connectors sealed? [no]
38	Alpha Code	Text	30 characters	Harness alpha code, only set in Designer from 3.0a and above.

Section 11: Module Compatibility Table

Field no.	Field name	Type	Format	Description
1	Module Code 1	Text	30 characters	The code for the first module child
2	Module Code 2	Text	30 characters	The code for the second module child

3	Relationship	Specific Value		Relationship between the modules (''(the default value), 'W', 'C', 'I' or 'M')

Section 12: Manual BOM Quantities

Field no.	Field name	Type	Format	Description
1	Split Value	Text	30 characters	The code for the component or insulation which is being split
2	Module Code	Text	30 characters	The code for the module child
3	Percentage	Number		The percentage of the component required on this module child.

Note

The field 'Split Value' is used to cross reference records between the new section 12 of the DSI and the existing sections 6 and 7.

Section 13: Composite Options Table

Field no.	Field name	Type	Format	Description
1	Option Name	Text	30 characters	The code for the composite option.
2	Description	Text	30 characters	The description of the option code.

Section 14: Wire Through Nodes

Field no.	Field name	Type	Format	Description
1	Wire Name	Text	30 characters	The name of the wire
2	Option	Text	30 characters	The option for the wire being routed NOTE: If this is left blank and there is only one wire with the name in field 1 then the option against that wire will be used.
3	Through Order	Number		The sequence number of the through node NOTE: If this is left blank or as zero then the program will use generated values for these sequence numbers
4	Through Node	Text	10 characters	The node name for the through node
5	Through Route	Text	30 characters	The route name for the through node
6	Through Flag	Logical		Does the wire go through this node? [yes]

Section 15: Branch Insulation Through Nodes

Field no.	Field name	Type	Format	Description
1	Piece Code	Text	30 characters	The piece code of the branch insulation
2	Through Order	Number		The sequence number of the through node NOTE: If this is left blank or as zero then the program will use generated values for these sequence numbers
3	Through Node	Text	10 characters	The node name for the through node
4	Through Route	Text	30 characters	The route name for the through node
5	Through Flag	Logical		Does the branch insulation go through this node? [yes]

Section 16: Mid Wire Components

Field no.	Field name	Type	Format	Description
1	Node Name	Text	10 characters	Node containing the mid wire component.
2	Route	Text	30 characters	Customer's orientation / dress route code.
3	Wire Name	Text	30 characters	Wire name as it appear in the Wire Name field of Section 5 for the mid wire component wire.
4	Option	Text	30 characters	The option for the wire having the mid wire component NOTE: If this is left blank and there is only one wire with the name in field 1 then the option against that wire will be used.
5	Mid Wire Option	Text	30 characters	The actual options that the wire is used on.
6	Cavity	Text	30 characters	The cavity where this wire is at this node
7	Through Order	Number		The order number within the wire through nodes list. If blank then this will be the order number for this node/wire/option combination (if it is unique), otherwise it will be left as 0 and a warning given

Section 17: Wire / Multicore Markers

Field No	Field name	Type	Format	Description
1	Item Type	Specific Value		Type of item being marked ('Wire', 'Multicore')
2	Item Name	Text	30 characters	The name of the wire or multicore being marked
3	Option	Text	30 characters	The option for the wire or multicore being marked NOTE: If this is left blank and there is only one wire or multicore with the name in field 1 then the option against that wire or multicore will be used.

Field No	Field name	Type	Format	Description
4	Location	Specific Value		The location of the marker ('Middle', 'End 1', 'End 2', 'Spaced')
5	Text	Text	30 characters	The text to appear on the marker – if blank this indicates a dot of paint
6	Color Code	Text	4 characters	The color of the marker
7	Spacing	Number		The spacing between instances of a marker (only relevant if the location is 'Spaced')

Section 18: Pin Mappings

Field no.	Field name	Type	Format	Description
1	Node 1	Text	10 characters	The node name of this pin mapping
2	Node 2	Text	10 characters	The node name of the component being joined
3	Harness Name 1	Text	30 characters	First harness part no. of the harness being joined *1
4	Harness Issue 1	Text	30 characters	First harness issue of the harness being joined *1
5	Harness Name 2	Text	30 characters	Second harness part no. of the harness being joined *1
6	Harness Issue 2	Text	30 characters	Second harness issue of the harness being joined If present these fields will be mapped using the harness name pull down lists on the import screen and used to find the harness to be joined. If no harness can be found (this may be the case if 2 DSI files are joined when the first 1 is imported) then the record will not be loaded and a warning will be given. If all these fields are empty then the mapping will be to the current harness.
7	Separator	Text	1 character	The separator character used to delimit the lists in field 8 and 9. THIS CANNOT BE THE SAME AS THE FIELD DELIMITER USED IN THE DSI FILE, BUT MAY BE DIFFERENT FOR DIFFERENT RECORDS IN THIS SECTION
8	Cavity Mapping 1	Text	100 characters	The list of cavities at node 1 (separated by the character in field 7)
9	Cavity Mapping 2	Text	100 characters	The list of cavities at node 2 (separated by the character in field 7)

Note

When joining 2 nodes on the same harness only 1 record will be present here. It may be written either way around.

Important Notes

This section contains some important notes that must be observed when converting data to the required input file format.

Naming Nodes (version 2 and later DSI files)

When processing an input file, the node name given in the DSI file will be used as the node in CAPITAL H. Where co-ordinates and / or service names are given these will be stored in the node location table.

It is up to DSI conversion routines to ensure that the correct node number is used in the DSI file.

Naming Nodes (version 1 DSI files)

Note
In the sections listed above, the Reference Name for Wires, Branch Insulations and Center Strips may be either the Service / Function of the node, or the Reference Name used in the Branch Configuration section. The Reference Name in the Components section must match that in the Branch Configuration.

When processing an input file, the final name given to a node will be assigned according to the following list of priorities:

- If a non-blank ‘Service / Function’ has been specified (see Section 6 above), and it consists of two or more words, the first word will be used as the node name.
- If a splice, ultrasonic weld or solder sleeve is present at the node, and the ‘Service / Function’ is a wire name (or a letter followed by a wire name) the node name will be in the form, e.g. S/J A3, or S/J 3.
- The node name will be the concatenated co-ordinates x-y or x-y-z, e.g. 999-100 or 999-100-20.
- The node reference name from the branch configuration will be used.
- The string ‘N-’ followed by a number will be the node name. This is also the case if the resultant node name of any of the above is too long or is not unique.

Component Selection

Various categories of component are selected through the input file processing procedure. For example **Splices, Ultrasonic Welds, Solder Sleeves, Heat Shrinks** for Welds and **Mandatory** components are selected automatically in the same way as they are for a harness inputted through the Engineering Base module.

Terminal selection is carried out according to a set pattern as follows:

- If a record in the Component Section includes a part number, a cavity name and Component Type Code 'Term', that terminal will be used at that cavity. A warning will be given however if the terminal does not fit the wire or connector at that node.
- If a record in the Component Section includes a part number, a Component Type Code 'Term' and a cross sectional area, it will be selected for cavities where it fits the wire and the requirement (or not) for gold plating. A warning will be given however if the terminal does not fit the wire (material) or the housing at the node.
- If a record exists in the Component Section, as above but without a cross sectional area, it will be selected for wires where it meets the requirement (or not) for gold plating. A warning will be given however if the terminal does not fit the wire or the housing at the node.
- If no terminal can be found using the above methods, a terminal will be chosen using CAPITAL H's standard terminal selection method – unless a record is present for the cavity with the select terminal flag set to 'no'.

Cavity Seal selection is carried out according to a set pattern as follows:

- If a node does not have any items with type 'Seal' or 'Plug' in the Component Section, the flag for cavity seal requirement will be set to 'No'. [DSI file version 1 only]
- If a record in the Component Section includes a part number, a cavity name and Component Type Code 'Seal', that cavity seal will be used. A warning will be given however if the terminal does not fit the wire or connector at that node.
- If a record in the Component Section includes a part number, a Component Type Code 'Seal' and a cross sectional area, it will be selected for cavities where it fits the wire. A warning will be given however if the seal does not fit the wire (material) or the housing at the node.

- If a record exists in the Component Section, as above but without a cross sectional area it will be selected for wires at the node. A warning will be given however if the seal does not fit the wire or the housing at the node.

- If no cavity seal is specified, but a record is present for the cavity with the select seal flag set to ‘yes’, a seal will be chosen using CAPITAL H’s standard selection method.

- If no cavity seal is specified, but a record is present for the node with the sealed cavities flag set to ‘yes’, a seal will be chosen using CAPITAL H’s standard selection method, unless a record is present for the cavity with the select seal flag set to ‘no’.

Cavity Plug selection is carried out according to a set pattern as follows:

- If a node does not have any items with type ‘Seal’ or ‘Plug’ in the Component Section, the flag for cavity plug requirement will be set to ‘No’. [DSI file version 1 only]

- If a record exists in the Component Section with a part number and a Component Type Code ‘Plug’, that cavity plug will be used for un-populated cavities at that node.

- If no cavity plugs have been found for a node, but a record is present for the node with the plugged flag set to ‘yes’,, cavity plugs will be chosen using CAPITAL H’s standard selection method.

Wire Type Code Translation

With reference to the Wire Specifications section, when processing an input file, Wire Type codes are translated with the following steps taken:

- The customer code held in the Wire Type field is directly translated to attempt to establish wire color, material and size.

- If no material has been found the customer code held in the Material field is translated. If there is still a problem an error is generated. The material and wire size for this wire will be set to the default as specified in the Notes section of the final exception report.

- If no wire color has been found, the customer codes in the Color field are translated. If there is still a problem an error is generated and the wire color for this wire is set to ‘-’.

- If no wire specification (size) has been found, the contents of the Cross Sectional Area field are translated in the Wire Size register using the translated material code. Firstly there is an attempt to retrieve a record with the ‘usual’ flag set, secondly an

attempt is made to get a record without this flag set. If there is still a problem an error is generated. The material and wire size for this wire will be set to the default as specified in the Notes section of the final exception report.

Multicore Type Code Translation

Note

This section applies to customer wire details that are translated using lookup tables. The new section 9 is applicable to multicore wires that are not translated (i.e. CAPITAL H transfers).

When processing an input file, multicores are handled in a similar fashion to wires however a Wire Type code must be given.

Note

If a multicore Wire Type code is NOT supplied the system cannot obtain details of the outer sheath. An error is therefore given and each inner core is treated as a single wire.

The inner cores are matched with those specified in the translated Wire Type code. Error reports are generated for any mismatch including an incorrect number of inner cores. Where there are mismatches, the wires remain as part of the multicore however the default material and wire specification (as listed in the Notes section of the exception report) are used for the incorrect inner cores.

Wire Numbering / Naming Conventions

When processing an input file, the Wire Name specified in the Wire Specifications section will always be stored as the customer wire number.

Internal wire numbers are generated depending upon the requirements specified when the processing is initiated:

- If ‘Use Customer Wire Numbers’ had been selected as the option, the Wire Name will also be used as the internal wire number. An exception is if that internal wire number already exists in which case another number will be generated (see next item).

- If ‘Generate Wire Numbers’ had been selected, each wire will have a numerical value generated and stored as the internal wire number. The first wire listed in the Wire Specifications section will be given wire number 1.
- If ‘Copy Wire Numbers’ had been selected, it is necessary to compare customer wire numbers with those belonging to another specified harness. For each wire in the Wire

Specifications section, an attempt is made to retrieve a wire with that customer wire number in the second harness. If found the internal wire number for the new harness is copied from the second harness. If the internal wire number already exists a new number is generated starting from the highest number so far used.

Block Numbering Conventions

When processing an input file, Block Numbers are generated for the end nodes of the harness. They are produced depending upon the requirements specified when the processing is initiated:

- If ‘Copy’ block numbers had been selected as the option, every node requiring a block number will be cross-referenced against another specified harness and if present, the same block number will be used on the new harness.
- If ‘New’ block numbers had been selected, each end node will have a new number assigned. If the node name is a letter followed by a number (e.g. G32) the block number will be the numerical part (e.g. 32) of the node name. Otherwise a new number will be generated starting from the previously used highest number.

Customer Part Number Translation

When processing an input file the following considerations are applied during part number conversion from customer to internal:

- Where relevant, the system will always try to retrieve an internal part number that belongs to the appropriate component group.
- The system will always try to retrieve part numbers based on the identity of the correct customer name.
- The system will attempt to translate the part number directly.
- If there is a problem, the system will remove all spaces (blank characters) and will attempt the translation again.
- If there is still a problem, the system adds a space to each position in turn and re-attempts a translation.

Types Used For Data In The DSI File

Where a field is defined to be of type ‘Specific Value’ a list of values will be given in quotation marks in the description section. If the DSI file contains no value in this section then the first value in the list (also highlighted in blue) will be used. If the DSI file contains a value not given in the list a warning message will appear in the DSI report, and an attempt will be made to choose an appropriate value, but if no appropriate value can be found then the first value in the list will be used.

Where a field is defined to be of type ‘Logical’ the following values will be accepted:

For ‘yes’: ‘yes’, ‘y’, ‘true’, ‘t’, ‘1’
For ‘no’: ‘no’, ‘n’, ‘false’, ‘f’, ‘0’

If no value is given then the default value will be used (given in square brackets after the field description and highlighted in blue). If an illegal value is given then a warning will be given and the default value used.

Capital Harness Systems Technical Support

If you are in need of assistance, contact Capital Harness Systems Technical Support at:

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	USA	1-800-547-4303
	Japan	0120-11-2572
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WWW	http://www.mentor.com/supportnet http://www.mentor.com/supportnet/support_offices.html	