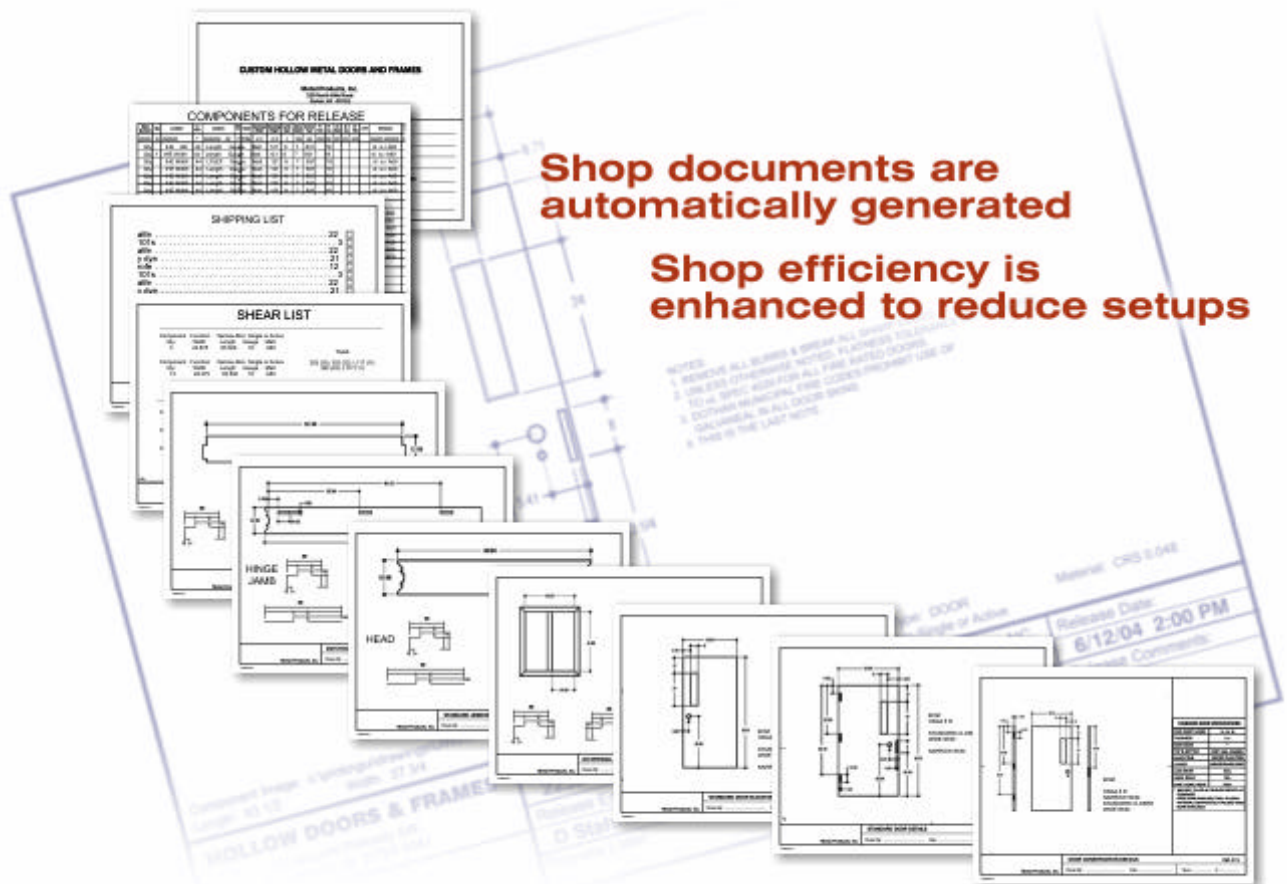


Hollow Metal Listing Sheets

The Digital Resources Listing Module automatically generates all required shop documents to manufacture doors and frames for elevations, regardless of complexity.

In general, the Hollow Metal GUI (Graphical User Interface) accepts industry-standard entry of Frame & Door information, and automatically generates all associated part drawings, programs for automated manufacturing equipment, List Sheets etc. This document specifically describes the engineering /manufacturing documents that are generated for doors and frames.



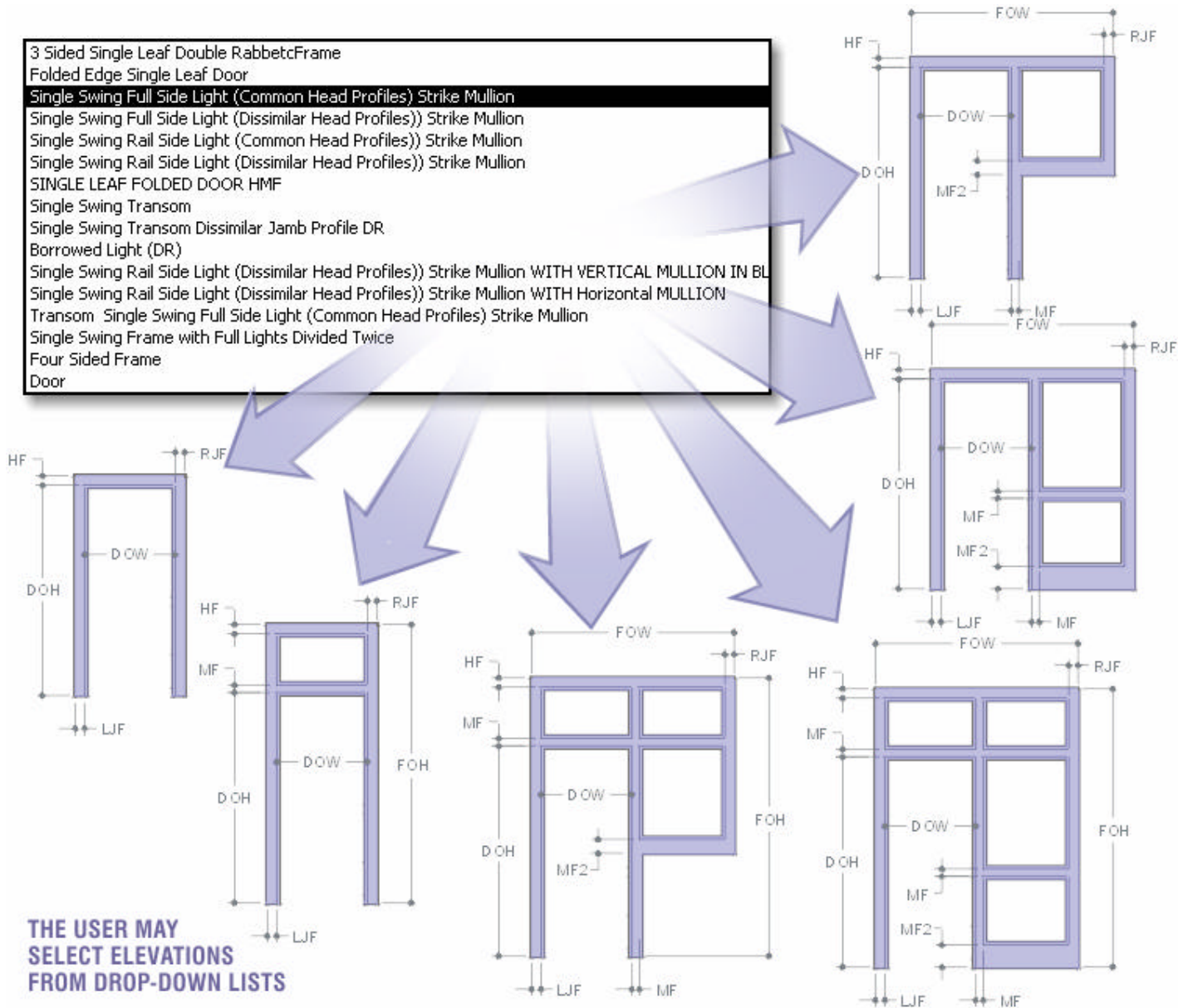
EFFICIENCY AND PRODUCTIVITY

Information is entered once for each opening. Components (heads, jambs, mullions, borrowed lights, etc.) are automatically developed from the elevations, then engineered, unfolded, and detailed by the system. *Parts do not have to be described individually.*

The output includes individual (turret) component list sheets, shear lists and Forming lists (all of which are optimized to reduce machine set up), complete Bills of Material (including all required fabricated parts, reinforcements, hardware), Assembly drawings and Shipping Documents.

The following pages outline some of the features of the Listing Sheet module.

- 3 Sided Single Leaf Double Rabbet Frame
- Folded Edge Single Leaf Door
- Single Swing Full Side Light (Common Head Profiles) Strike Mullion
- Single Swing Full Side Light (Dissimilar Head Profiles) Strike Mullion
- Single Swing Rail Side Light (Common Head Profiles) Strike Mullion
- Single Swing Rail Side Light (Dissimilar Head Profiles) Strike Mullion
- SINGLE LEAF FOLDED DOOR HMF
- Single Swing Transom
- Single Swing Transom Dissimilar Jamb Profile DR
- Borrowed Light (DR)
- Single Swing Rail Side Light (Dissimilar Head Profiles) Strike Mullion WITH VERTICAL MULLION IN BL
- Single Swing Rail Side Light (Dissimilar Head Profiles) Strike Mullion WITH Horizontal MULLION
- Transom Single Swing Full Side Light (Common Head Profiles) Strike Mullion
- Single Swing Frame with Full Lights Divided Twice
- Four Sided Frame
- Door



**THE USER MAY
SELECT ELEVATIONS
FROM DROP-DOWN LISTS**

SELECTING AN ELEVATION:

Elevations are included in a job by selecting them from a list. The basic system comes with a comprehensive set of elevations. A few of these are shown in the illustration above. Users can easily add new ones as needed.

Elevation masters represent general frame configurations or layouts. These are all parametric and may be assigned different profiles and an infinite combination of dimensional values. The elevations of a given job are defined by entering these dimensions.

The individual parts that comprise each elevation are defined by the system and the engineering for each component occurs automatically. The way that this occurs is explained in the following section.

PROFILE TYPES AND DIMENSIONS:

Profiles are also defined in a job by selecting them from a list. Profiles are flexible, and the list of available profiles represents general geometric configurations or layouts which require dimensions. See the diagram below for a more detailed explanation.

Each profile type & variation (Double and Single Rabbet, Cased Open, Double Egress, Mullions, Drywall, Masonry, etc.) are included in a drop-down list (see below).

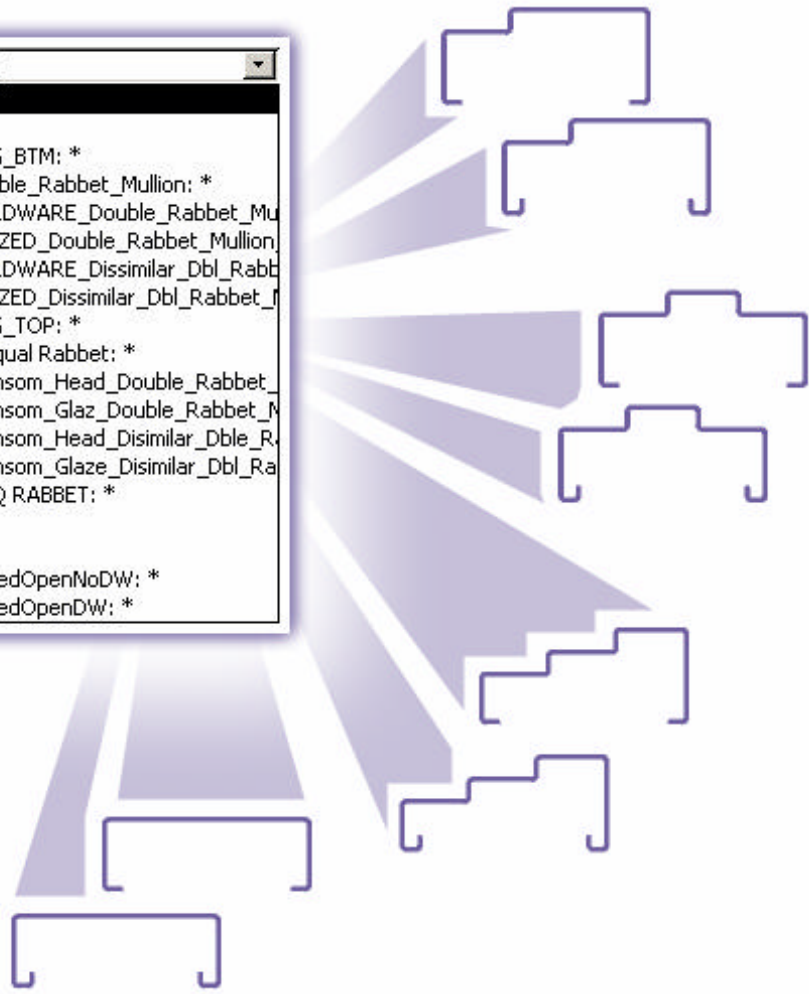
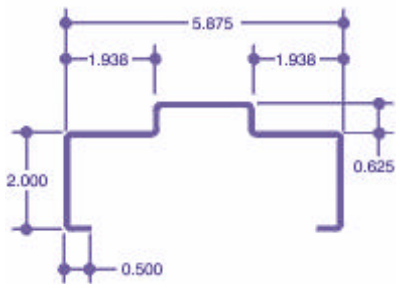
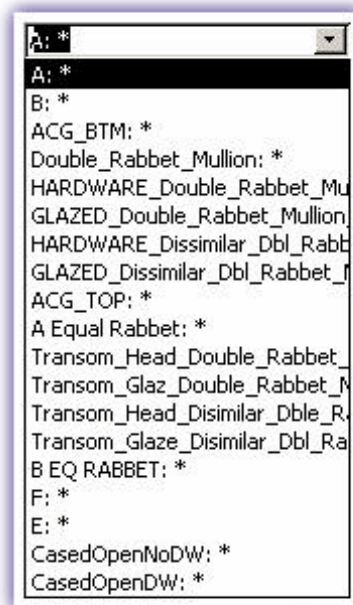
The user selects the Profile and supplies the dimensional information. The described Profile is now stored by the system and is available to be applied to elevations (or parts thereof) within the current job.

PROFILES:

Profile types are selected from a drop-down list.

A selected profile may be applied to an entire elevation or to portions thereof.

Profiles are parametric, that is, their sizes are controlled or modified by user supplied dimensions.

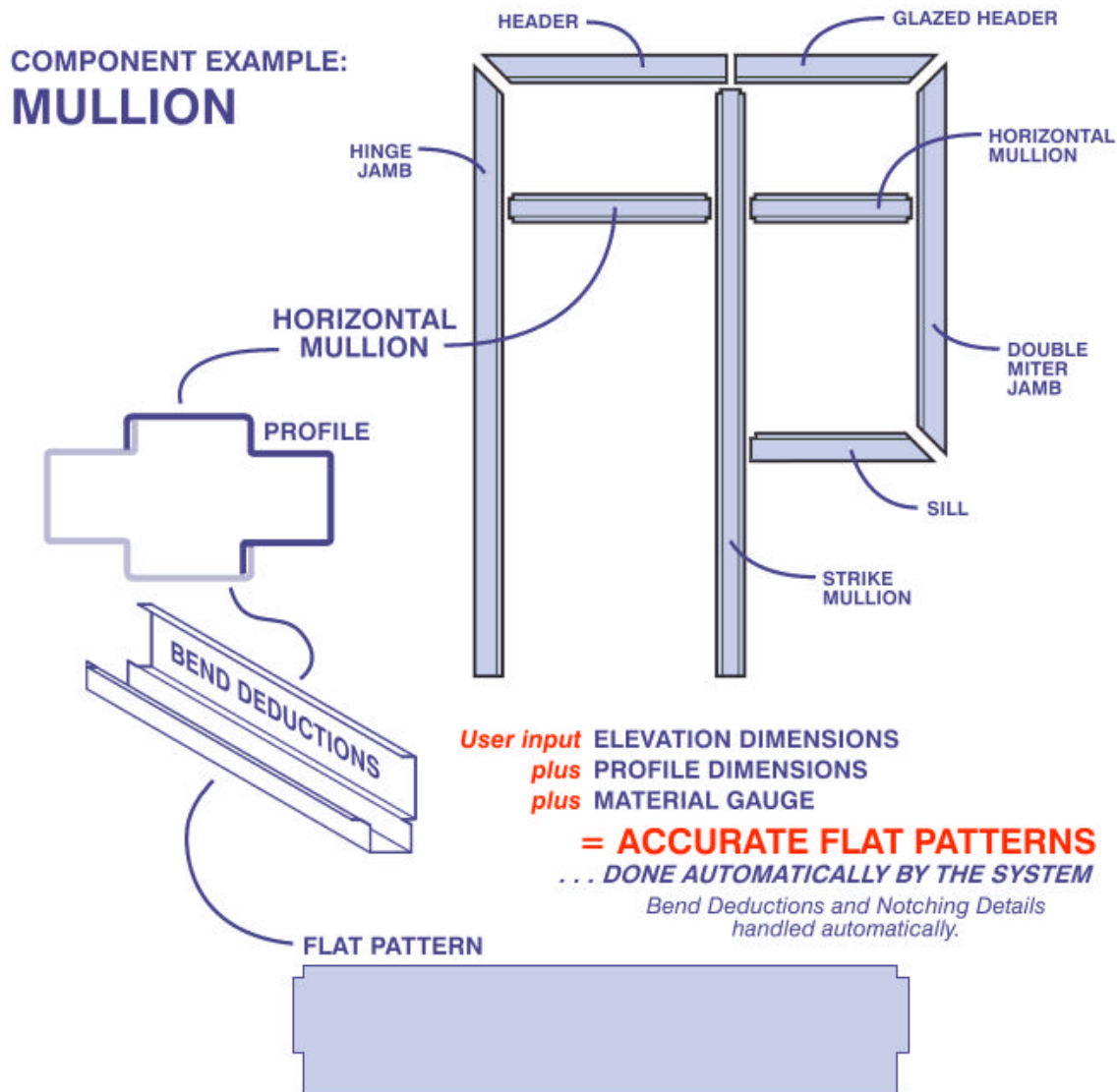


ELEVATION COMPONENTS AUTOMATICALLY CREATED:

Once an elevation master has been selected, and profiles have been assigned, the user is prompted to provide the information necessary to accurately describe its features. The user inputs are applied to the entire elevation as well as the individual elements.

In this manner, all of the components for each elevation are derived by the system.

The diagram below illustrates this.



All components of an elevation are automatically defined and generated as described above.

Once specific part data has been derived for each component, the information may be applied to the creation of engineering drawings, List Sheets, Forming Lists, Brake Lists, programs for automated machinery, etc.

MANAGING COMPONENT RELATIONSHIPS

A unique and very powerful aspect of the system is the way that it manages relationships between intersecting components of the various elevations.

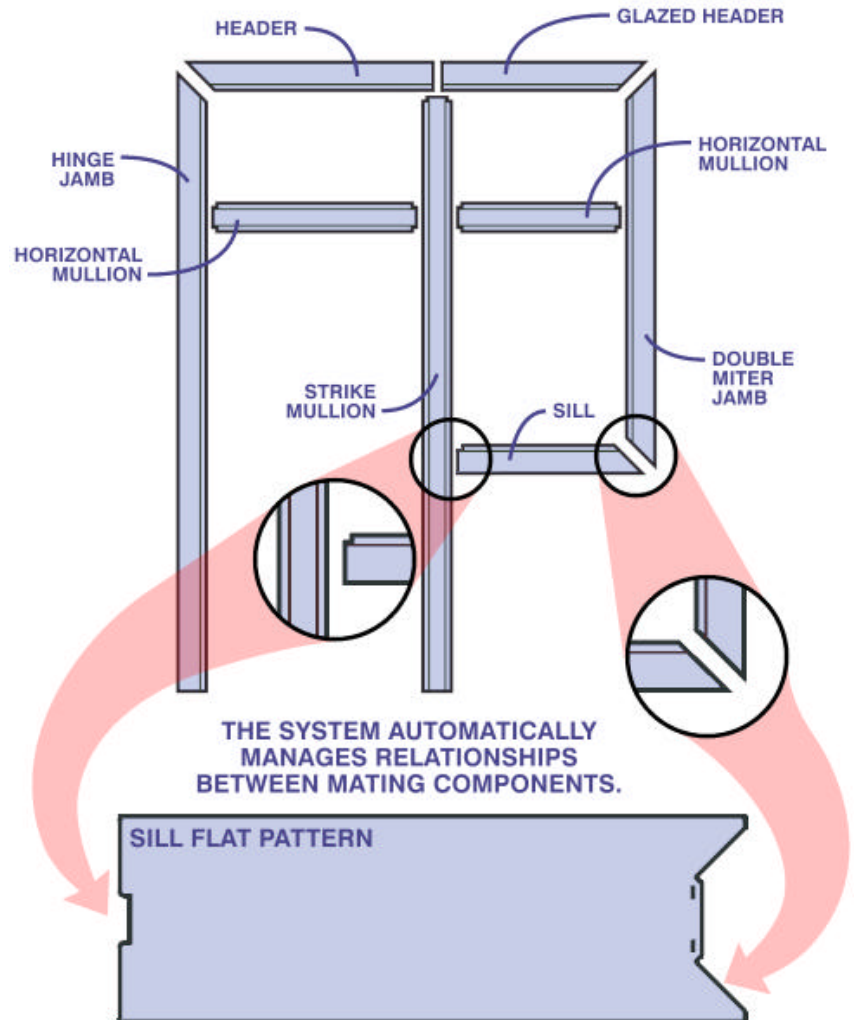
In every elevation, the system knows how to apply profile and dimensional information to the various components, and describes the way those components affect each other.

In the case shown here, the intersection of the sill with both of the mating components is already known to the system. Because of this, the correct geometric and dimensional parameters are applied automatically.

User interaction is only required to define aspects of the sill that are specific to that component (such as the face dimension). The relationship of the sill to adjacent parts is managed by the system. This is true of all of the components in an elevation.

Of course, the specific elements of each component vary between manufacturers, but once your system has been configured, the parts will exactly match the way you are doing things right now.

This drastically reduces engineering time, while eliminating errors.



FRAME MATERIAL:

Frame material is selected from a pre-defined list as well. Material and Gauge information is fed into the system to supply engineering data that will affect the dimensions of the flat-pattern bend allowance, hardware placement, etc.

12A: Galv Special: 12:0.108: A60:
14A: Galv Special: 14:0.078: A60:
16A: Galv Special: 16:0.063: A60:
12G: GalvanizedSteel: 12:0.108: G90:
14G: GalvanizedSteel: 14:0.078: G90:
16G: GalvanizedSteel: 16:0.063: G90:
12C: CarbonSteel: 12:0.105: CRS:
14C: CarbonSteel: 14:0.075: CRS:
16C: CarbonSteel: 16:0.06: CRS:

HARDWARE SPECIFICATION:

HINGES:

Fields are provided for input of hinge size, weight, backset and quantity. Hinge locations are automatically calculated once the user specifies quantity and manufacturer location format. Values supplied by the system may be overridden by the user if deemed appropriate.

STRIKES:

Input fields for strike types and locations are also presented, as shown below.

- 5-10: 5-EQUAL-10
- AMW: Amweld
- BAR: Baron
- BEN: BenchmarkHMF
- CEC: Ceco
- CUR: Curries
- DEA: Deansteel
- KEW: Kewanee
- PIO: Pioneer
- STE: Steelcraft
- STI: Stiles

- ASA LL
- NONE
- Standard T
- ASA
- Standard Deadlock Strike
- Blank

Hardware Inputs

Locations:	CEC: Ceco	
Hw sets:		HLDQH:
Hinge Size:	A: 4 1/2" x 4"	H1: 6 3/4
HingeWeight:	SWH: Standard Weigt	H2: 42 3/4
HingeBackSet:	5/16	H3: 78 3/4
Hinge Quantity:	3 Hinges	H4:
		H5:
Strike 1:	Standard T	Stk1 C/L: 34.5
Strike 2:		Stk2 C/L:

CL Is Knob

Pick hinge quantity & manufacturer location format. Dimensional values are filled-in automatically.

HARDWARE SETS

Hardware Sets are drawn from an extensive library of manufacturers' part numbers. Once these are selected and applied, the system automatically places them in the flat.

<ul style="list-style-type: none"> Yale Cor Corbin Russwin Best SIMPLEX S & G SCHLAGE VON DUPRIN OMNIOLOCK PRECISION DORMA MARKS SARGENT test IN HOUSE Falcon MONARCH Arrow Glynn Johnson LCN Marks USA McKinny 	<ul style="list-style-type: none"> Lock TEST WINDOW Strike MISC closer HINGE Reinforcement 	<ul style="list-style-type: none"> Mortise DeadLock test WINDOW STRIKE Cylindrical Panic VIEWERS 	<ul style="list-style-type: none"> 35H Series Mortise Lock YALE8000SERIESTYPEASECTIONAL Russwin5000Corbin9500 Sargent4870Series 4600_8600_8700_SERIES 7800_8200_Series 4600_8600_8700_Escutcheon_Trim DH_12
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SAMPLE LIST SHEETS (Generated Automatically)

Once the required information is entered, hitting the "PROCESS" button produces all of the required listing sheets & drawings. Details of each type of shop document are shown below.

SHEAR SIZE
Length: 79 1/2 Width: 36 7/8

NC PROGRAM
Tape: JS1744

MATERIAL & GAUGE
Material: CRS 0.048

TURRET COMPONENT

Turret Component Report (C) 2004 by Digital Resources

Job Name 22520	Release Name doors	Doors <input type="checkbox"/> A	Frames <input type="checkbox"/>	NC <input type="checkbox"/>	Release Date 8/15/2003 3:19:58 PM
Release Engineer TRB	JobShipDate 8/15/2003 3:19:58 PM	Job ID	Release comment		
Release Lister	Project Manager				

Component Image: c:\proto\gui\drawings\JS1744.dwg Profile Image: Elevation Type: DOOR Material: CRS 0.048
 Length: 79 1/2 Width: 36 7/8 Tape: JS1744 Qty: 1 Function: Narrow Skin Single or Active

Tag [Assy Group] (Qty)
HAND: LHR 112 [9]

TAGS, HANDED & GROUPED

This is a shop drawing of a Turret Component (fabricated part). Along with the dimensioned drawing, the appropriate job-related information is included as well.

These documents can be configured to incorporate whatever information the shop requires.

Shear list sorted by Mat'l, Function, Size.
 Sorting may be modified to match a
 specific customer's shop methods.

MATERIAL:	18	A60
COMPONENT FUNCTION:	Narrow-Skin_Single or Active	
QTY	WIDTH	LENGTH
3	24.875	83.500
	GAUGE	MTL
	18	A60

SHEAR RELEASE

SHEAR RELEASE by FUNCTION

JOB NAME 22520	RELEASE NAME doors	DOORS FRAMES NC <input type="checkbox"/> A <input type="checkbox"/>	RELEASE DATE 8/15/2003 3:19:58 PM
RELEASE ENGINEER TRB	JOB/DATE 8/15/2003 3:19:58 PM	JOB ID	RELEASE COMMENT
RELEASE LETTER	PROJECT MANAGER		

MATERIAL:	18	A60
COMPONENT FUNCTION:	Narrow-Skin_Single or Active	
QTY	WIDTH	LENGTH
3	24.875	83.500
	GAUGE	MTL
	18	A60

TAGS
L101[26], L102[27], L103[31]
[26]=1, [27]=1, [31]=1

11	36.875	79.500	18	A60	101[17], 101A[25], 102[16], 102A[22], 103[12], 104[19], 105[3], 106[6], 107[18], 108[7], 109[4], 117]=1, [25]=1, [16]=1, [22]=1, [12]=1, [19]=1, [3]=1, [6]=1, [18]=1, [7]=1, [4]=1
2	24.875	83.500	18	A60	122[21], 301[1] [21]=1, [1]=1

MATERIAL:	18	CRS
COMPONENT FUNCTION:	Narrow-Skin_Single or Active	
QTY	WIDTH	LENGTH
2	24.875	83.500
	GAUGE	MTL
	18	CRS

TAGS
L201[36], L202[37]
[36]=1, [37]=1

1	24.875	83.500	18	CRS	222[21] [21]=1
9	36.875	79.500	18	CRS	201[37], 201A[35], 202[36], 204[29], 205[23], 206[16], 207[38], 208[37], 209[34], [37]=1, [36]=1, [16]=1, [29]=1, [23]=1, [36]=1, [38]=1, [37]=1, [34]=1

MATERIAL:	16	CRS
COMPONENT FUNCTION:	Narrow-Skin_Single or Active	
QTY	WIDTH	LENGTH
3	24.875	83.500
	GAUGE	MTL
	16	CRS

TAGS
L416[56], L412[47], L403[41]
[56]=1, [47]=1, [41]=1

19	36.875	79.500	16	CRS	401[17], 401A[25], 402[16], 402A[22], 403[12], 406[6], 407[18], 408[7], 409[4], 401A[25], 402[16], 402A[22], 403[12], 404[19], 405[3], 406[6], 407[18], 408[7], 409[4], [17]=1, [25]=1, [16]=1, [22]=1, [12]=1, [19]=1, [3]=1, [6]=1, [18]=1, [7]=1, [4]=1, [16]=1, [22]=1, [12]=1, [19]=1, [3]=1, [6]=1, [18]=1, [7]=1, [4]=1
2	24.875	83.500	16	CRS	122[21], 301[1] [21]=1, [1]=1

MATERIAL:	14	CRS
COMPONENT FUNCTION:	Narrow-Skin_Single or Active	
QTY	WIDTH	LENGTH
3	24.875	83.500
	GAUGE	MTL
	14	CRS

TAGS
L101[26], L102[27], L103[31]
[26]=1, [27]=1, [31]=1

TAGS	
L101[26], L102[27], L103[31]	[26]=1, [27]=1, [31]=1

TAG/MARK Number and [GROUP]

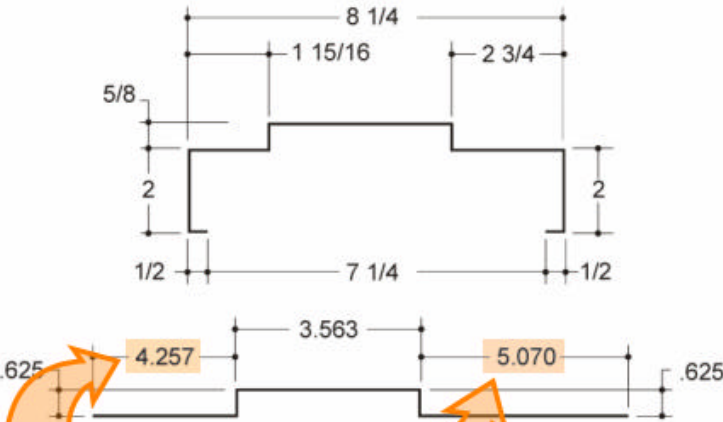
[GROUP #] refers to Assembly List Sheet

FORMING LIST

FORMING REPORT

JOB NAME 22520	RELEASE NAME doors	DOORS <input checked="" type="checkbox"/>	FRAMES <input type="checkbox"/>	NC <input type="checkbox"/>	RELEASE DATE 8/15/2003 3:19:58 PM
RELEASE ENGINEER TRB	JOBSHIPDATE 8/15/2003 3:19:58 PM	JOB ID	RELEASE COMMENT		
RELEASE LISTER	PROJECT MANAGER				

Profile 1 Face 2 Jamb Depth 8.25 MATL CRS 14



**Precise dimensions
for numerically controlled
forming equipment**

Qty	Width	Length	Gauge	MTL	Hand	Function
1	13.782	39.969	14	CRS	LH	Header
100B [1]	13.782	85.969	14	CRS	LH	Hinge Jamb
100B [1]	13.782	85.969	14	CRS	LH	Strike Jamb



GROUPING
Includes all parts with
like forming profile

ANCHORS

ANCHORS LEFT / RIGHT

Loose Base Clip
Loose Base Clip

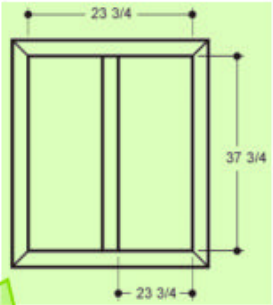
OPENING SIZE

WIDTH (DOW) HEIGHT (DOH)
4' 0" **3' 1"**

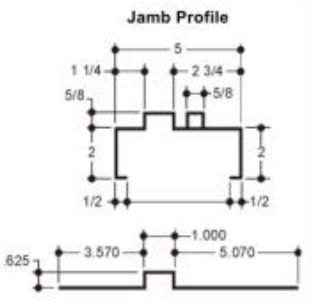
Frame Assembly in Release Group 5

JOB NAME		RELEASE NAME		DOORS	FRAMES	NC	RELEASE DATE
DEMO		demo_A		<input checked="" type="checkbox"/> A	<input checked="" type="checkbox"/> A	<input type="checkbox"/>	7/22/2004 12:23:49 AM
RELEASE ENGINEER		SHIP DATE		JOB IDENTIFICATION			
DR		7/21/2004 9:36:49 AM		12345			
RELEASE LISTER		PROJECT MANAGER		RELEASE MANAGER			
DR							

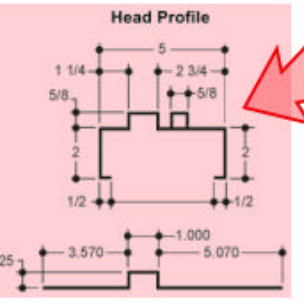
FRAME ELEVATION		ANCHORS LEFT / RIGHT		HINGE WEIGHT		HINGE LOCATIONS	
Borrowed Lt / w Vert Div.		Loose Base Clip Loose Base Clip		Std. Weight		1. 0	
WIDTH (DOW)	HEIGHT (DOH)			HINGE SIZE		2. 0	
4' 0"	3' 1"			4 1/2" x 4 1/2"		3. 0	
MATL	THK	FRAME LABEL	JOB ELEV			4. 0	
A60	16	WH	131 BL			5. 0	
FACE HW HEADING	JAMB DEPTH	CONSTRUCTION		KD	BELOW FLOOR		
	5	Welded-Standard Miter		<input type="checkbox"/>			
		STRIKE 1:					
		STRIKE 2:					



DIMENSIONED DRAWING



Jamb Profile



Head Profile

PROFILE DATA

LH/RHR Qty 1	RH/RHR Qty 2	Total = 3	BOM
401	901, 902		Glaze Jamb 6
			Head Glaze 3
			Mullion Half 6
			Sill-Glaze 3

TAGS

RH/RHR Qty 2
901, 902

LIST OF PARTS

BOM	
Glaze Jamb	6
Head Glaze	3
Mullion Half	6
Sill-Glaze	3

ASSEMBLY DRAWING - BORROWED LIGHT

OPENING SIZE

WIDTH (DOW) HEIGHT (DOH)
3'-0" 7'-0"

ANCHORS

ANCHORS LEFT / RIGHT
**Loose Base Clip
Loose Base Clip**

STRIKE LOCATIONS

STRIKE 1: **ASA 40"**
 STRIKE 2:

HINGE LOCATIONS

HINGE LOCATIONS

1. 5
2. 37.25
3. 69.5
4. 0
5. 0

Note: Dimensions may be from either TOP or BOTTOM of part, as per your rules.

Frame Assembly in Release Group 5

JOB NAME	RELEASE NAME	DOORS	FRAMES	NO	RELEASE DATE
DEMO	demo_A	<input checked="" type="checkbox"/> A	<input checked="" type="checkbox"/> A	<input type="checkbox"/>	7/22/2004 12:23:49 AM
RELEASE ENGINEER	SHIP DATE	JOB IDENTIFICATION			
DR	7/21/2004 9:36:49 AM	12345			
RELEASE LISTER	PROJECT MANAGER	RELEASE MANAGER			
DR					

FRAME ELEVATION	ANCHORS LEFT / RIGHT	HINGE WEIGHT	HINGE LOCATIONS
Borrowed Lt /w Vert Div.	Loose Base Clip Loose Base Clip	Std. Weight	1. 5
WIDTH (DOW) HEIGHT (DOH)		HINGE SIZE	2. 37.25
3'-0" 7'-0"		4 1/2" x 4 1/2"	3. 69.5
MATL THK FRAME LABEL JOB ELEV	CONSTRUCTION		4. 0
A60 16 WH 131 BL	Welded-Standard Miter		5. 0
FACE HW HEADING JAMB DEPTH			
5			

Jamb Profile

Head Profile

LH/RHR Qty 1	RH/RHR Qty 2	Total = 3	BOM
401	901, 902		Hinge Jamb 6 Strike Jamb 6 Head 3

TAGS

RH/RHR Qty 2
901, 902

LIST OF PARTS

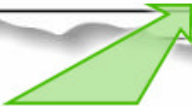
BOM	
Hinge Jamb	6
Strike Jamb	6
Head	3

ASSEMBLY DRAWING - FRAME

SHIPPING LIST

MARKS in RELEASE

JOB NAME	RELEASE NAME	DOORS	FRAMES	NC	RELEASE DATE
DEMO	demo_A	<input checked="" type="checkbox"/> A	<input checked="" type="checkbox"/> A	<input type="checkbox"/>	7/22/2004 12:23:49 AM
RELEASE ENGINEER	SHIP DATE	JOB IDENTIFICATION			
DR	7/21/2004 9:36:49 AM	12345			
Frames			Doors		
Tags	Partial Components	Qty	Tags	Partial Components	Qty
901	<input type="checkbox"/>	1	204	<input type="checkbox"/>	1
101	<input type="checkbox"/>	1	103	<input type="checkbox"/>	1
301	<input type="checkbox"/>	1	903	<input type="checkbox"/>	1
103	<input type="checkbox"/>	1	301	<input type="checkbox"/>	1
902	<input type="checkbox"/>	1	501	<input type="checkbox"/>	1
201	<input type="checkbox"/>	1	102	<input type="checkbox"/>	1
102	<input type="checkbox"/>	1	101	<input type="checkbox"/>	1
202	<input type="checkbox"/>	1	901	<input type="checkbox"/>	1



PARTIAL COMPONENTS MAY BE SHIPPED SEPARATELY AND ARE TRACKED BY THE SYSTEM.

BILL OF MATERIAL

Components for Release

JOB NAME	RELEASE NAME	DOORS	FRAMES	NC	RELEASE DATE			
DEMO	demo_A	<input checked="" type="checkbox"/> A	<input checked="" type="checkbox"/> A	<input type="checkbox"/>	7/22/2004 12:23:49 AM			
RELEASE ENGINEER	SHIP DATE	JOB IDENTIFICATION						
DR	7/21/2004 9:36:49 AM	12345						
RELEASE LISTER	PROJECT MANAGER	RELEASE MANAGER						
DR								
Part	Cat	Profile	Face	Child Of	Qty	Width	Length	Tape Name
Closer Reinf PA	DSM			Narrow_Cover	6			
Closer Reinf PA	DSM			Wide_Pan	6			
Door Bottom Channel					1	3 11/16	35 1/2	P0649
Door Bottom Channel					1	3 11/16	35 1/2	P0654
Door Bottom Channel					1	3 11/16	35 1/2	P0659
Door Bottom Channel					1	3 11/16	35 1/2	P0664
Door Bottom Channel					2	3 11/16	41 1/2	P0669
Door Document					0			P0660
Door Document					0			P0665
Door Document					0			P0670
Door Top Channel					1	3 11/16	35 1/2	P0661
Door Top Channel					1	3 11/16	35 1/2	P0666
Door Top Channel					2	3 11/16	41 1/2	P0671
Glaze Jamb		2A	2		4	10 49/64	33 15/16	P0636
Glaze Jamb		2A	2		1	10 49/64	49 15/16	P0640
Glaze Jamb		2A	2		1	10 49/64	49 15/16	P0642
Head - Door		1A	2		0	10 49/64	38 29/32	P0628
Head - Door		1A	4		1	11 21/32	39 13/16	P0644
Head - Glaze		1A	2		2	11 21/32	45 13/16	P0622
Head - Glaze		1A	2		0	10 49/64	20 29/32	P0631
Head - Glaze		2A	2		4	11 21/32	75 13/16	P0637
Head - Glaze		2A	2		4	11 21/32	99 13/16	P0643
Head - Glaze		2A	2			11 21/32	75 13/16	P0647