

CHARACTERISTICS OF VARIOUS EQUIPMENT TYPES

Manufacturers have responded to the constantly changing storage environment by developing a systems approach to the design of cabinets, shelving, racks, slat wall, and carousels. Evaluation of these systems is based on the interchangeability of their components, ease of adjustment without the use of tools, versatility in making efficient use of space, ability to store multiple formats, and quick reconfiguration of equipment in response to new formats or growing collections and collection shifts.

Cabinets

KI

The design of KI's 700 Series files and storage cabinets provide a flexibility that not only can store current multimedia but also can be adapted to future multimedia formats not yet imagined.

KI's modular upright construction 700 series lateral file cabinets accommodate various media with seven drawer sizes: 3", 6", 9", 10 1/2", 12", 13 1/2", and 15". It claims that by using its 10 1/2" file drawers, rather than standard 12" drawers, a 25% space-savings can be achieved. Drawers have been tested to accept loads of 125 pounds.

The divider system for 6" drawer interiors can be configured, and reconfigured, to accommodate disks, CDs, VHS tapes, Jaz cartridges, microfiche, and other miscellaneous items. Clip-fit components provide storage for every media type. KI parts clip into place every 1 1/2" to allow unlimited drawer configurations that can be changed easily as needs change.

KI's 700 Series storage cabinets (see Figure 1) also can be used for multimedia.

Storing virtually any type of media with the use of its optional interior components is possible. The storage cabinets' 1 1/2" modular upright construction makes installing the various interior options easy and lets you quickly reconfigure the cabinets' interior.

The cabinet shell is common to both the lateral file and storage cabinet units. They are available in three standard widths: 30", 36", and 42". All lateral file and storage cabinets are 18 7/8" deep. Filing and storage cabinets' heavy-duty construction consists of 18- and 20-gauge, cold-rolled steel, welded rigid box frame, and reinforced corners. KI's 700 Series' 1 1/2" modularity makes possible unlimited configurations within 40 standard heights.

Steel is chemical etched to assure bonding of two-stage polyester paint that is baked on, providing stain and scratch resistance. For smooth, reliable door operation, 700 Series cabinets feature the durable Euro-hinge mechanism that

Jaz cartridges are inserted in a Jaz drive, a removable disk drive developed by Iomega Corp. Cartridges hold up to 2 gigabytes of data. Its fast data rates and large storage capacity make it a viable alternative for backup storage as well as everyday use.



Figure 1. KI Multimedia Cabinets

correctly aligns doors by adjusting the Euro-hinge three ways. The company provides a lifetime warranty for the 700 Series. Lifetime is defined as "for as long as the original owner possesses the equipment."

KI has a planning guide for equipment capacities for all types of media ranging from the standard hanging file folders to various-sized printout binders, various-sized magnetic tape, and various-sized disk packs. Figure 2 shows KI's equipment capacities for media most common in libraries.

Media type	Filing method	Required opening height	Cabinet width, in.	Capacity per opening 700 Series
7" disk pack IBM 3336	Set on shelf	9" drawer	30	1
			36	2
			42	2
2 1/2"x4" VHS cassettes	Front to back with drawer organizer option	6" drawer	30	125
			36	150
			42	200
	Front to back on two rollout shelves with drawer organizer option	Behind 12" receding door	30	250
			36	300
			42	400
6"x4" VHS cassettes	Front to back with drawer organizer option	6" drawer	30	45
			36	60
			42	60
	Front to back on two rollout shelves with drawer organizer option	Behind 12" receding door	30	90
			36	120
			42	120
6"x4"x6mm Tape cartridge	Front to back with drawer organizer option	6" drawer	30	64
			36	64
			42	80
	Front to back on two rollout shelves with drawer organizer option	Behind 12" receding door	30	128
			36	1,128
			42	160

Figure 2. KI Cabinet Multimedia Capacities

Russ Bassett

Media 4 5/8" high

Russ Bassett manufactures two VisuFlex® cabinet models, VML-5 and VML-10, for storing media up to 4 5/8" high. All drawers are equipped with adjustable dividers for filing roll film, microfiche, aperture cards, and other small media formats in the same cabinet or within the same drawer.

The adjustable steel dividers can be repositioned in 1/4" increments easily and without tools. This capability allows for configuration for any specific

application within the 4 5/8" height range. If filing requirements change, the cabinet can be instantly reconfigured.

Media	# of rows per drawer	Qty. of dividers per drawer	Capacity per drawer	Bookend
16mm	9	8	144	V3x3
35mm	9	8	81	V3x3
Fiche	6	5	15,846	V3x3
Aper. Cards	6	4	8,060	V3x3
4mm tape	12	11	300	V2x2
8mm tape	9	8	171	V2x2
Audiocassette	9	8	207	V2x2
DVC pro medium	9	8	171	V2x2
DVC pro large	7	7	133	V3x3
DLT in vox	8	7	108	V3x3

Figure 3. Russ Bassett VML-5 and -10 Cabinets Multimedia Storage Capacities

These cabinets are heavy gauge, fully welded steel construction. Drawers (see Figure 3) are equipped with heavy-duty Accuride® slides. A gang lock is optional.

VisuFlex steel products are warranted to be free from defects in workmanship and materials for 15 years, plastic components for five years.

Media 6" high

VisuFlex cabinet models VML-4 and VML-8 are designed to store VHS tapes, compact disks, and audiocassettes, as well as many other audio-video media formats. The dimensions of these cabinets are the same as for the VisuFlex models for 4 5/8" high media (see Figure 4).

Model	Description	CD	Capacity			Dimensions		
			Audio	VHS	Beta	Height, in.	Width, in.	Depth, in.
VML-4	4-drawer cabinet	1,248	864	260	240	28 7/8	43 1/8	18 1/4
VML-8	8-drawer cabinet	2,496	1,728	520	480	56	43 1/8	18 1/4

Figure 4. Russ Bassett VML-4 and -8 Cabinets Multimedia Storage Capacities

Montel, Inc.

Montel, Inc., manufactures a MixMedia® cabinet that will adapt to future needs as media change to new formats (see Figure 5). This cabinet is fabricated of two double walls, one full-size back, a reinforced canopy top and center shelf, and heavy-duty base. Other considerations for its selection include:

- Completely enclosed structure appropriate for archive storage
- Drawers
 - Six vertical drawers (see Figure 6)
 - Six, eight, or 10 horizontal drawers
 - Lockable horizontal and vertical drawers
- Shelves adjustable every 5/8" to accommodate different media sizes

- Multimedia drawers are interchangeable with Montel SmartShelf®.
- Available as fixed cabinets or on mobile carriages.
- Can be securely anchored to the floor, wall, back-to-back, or side-by-side.
- Adjustable levelers
- Safety interlock avoids opening more than one drawer at a time, preventing accidental tipping
- Full extension ball-bearing drawers
- Base: Welded, 4 1/2" high, designed to accommodate a pallet lift. A removable 12-gauge steel plate is installed at the front and back to conceal the area used for the pallet lift.
- All parts are free from exposed sharp edges or projections.
- Finish: Epoxy-polyester hybrid powder coat free from off-gassing to prevent deterioration of the media collection
- 10-year warranty
- Optional accessories
 - o Card holders
 - o Progressive media support
 - o Progressive divider front-to-back
 - o Shelves (pullout vertical drawers) and dividers (horizontal drawers)



Figure 5. Montel MixMedia Cabinet

Dimensions	# of drawers	Drawer heights, in.	Quantity		
			CD	DVD	VHS
18" deep x 39 3/8 wide x 78" high	6 + 6 pullout	6	2,856	1,404	684
	8 + 6 pullout	4 1/2	-	-	808
18" deep x 39 3/8 wide x 39" high	6	6	1,586	756	372
18" deep x 39 3/8 wide x 78" high	8	4 1/2	-	-	496
18" deep x 39 3/8 wide x 51" high	8	6	2,128	1,008	496
18" deep x 39 3/8 wide x 48" high	10	4 1/2	-	-	620
	6 + 6 pullout	6	3,906	2,046	936
24" deep x 39 3/8 wide x 78" high	8 + 6 pullout	4 1/2	-	-	1,096
	6	6	2,142	1,134	480
24" deep x 39 3/8 wide x 39" high	8	4 1/2	-	-	640
	8	6	2,856	1,512	640
24" deep x 39 3/8 wide x 51" high	8	6	2,856	1,512	640
24" deep x 39 3/8 wide x 48" high	10	4 1/2	-	-	800

Figure 6. Montel MixMedia Cabinet Storage Capacities

Electrostatic dissipative paint finishes help remove static charges that could destroy all the information stored on electronic media.

Dasco Data Products (DDP)

Since 1963 DDP has been designing, engineering, and producing products for the media and systems storage market. DDP multimedia storage cabinets' unique design details include an all steel bi-parting door that glides on an aircraft cable track system. The cable system is guaranteed not to break, fray, rust, or corrode for the life of the cabinet.

These cabinets are available in five heights: 51", 60", 64", 72", and 83". Standard cabinets are 36" wide by 22" deep. Interior components, such as multimedia rollout shelves, filing drawers, shelves, and laptop inserts, are preinstalled according to the purchaser's specifications before the cabinet is shipped.

Equipto

Equipto was founded in 1907 to provide products for the materials handling industry. Modular drawer cabinets make up one of its product lines. These cabinets are flexible, both for use with a single medium and multimedia. Features include:

- Adjustable channels permit flexibility in drawer arrangements and heights.
- Independent, full extension carriage for each drawer; when fully extended, 100% of the drawer clears the frame to allow unobstructed viewing of entire drawer contents.
- Drawer suspensions glide on six ball bearings and four steel idler rollers to assure smooth, easy operation.
- Each drawer is ribbed and slotted on 3/4" centers over the length and width of the drawer.
- The interchangeability of drawer partitions and dividers permits easy changing of drawer interiors in unlimited patterns.
- Equipto TipStop® is a floor anchoring system for the modular drawer cabinets that prevents the cabinet from tipping forward, making more than one-drawer accessibility possible. In seismically active areas, TipStop meets seismic code requirements. This feature, or similar ones, must be used on all cabinets 44" high and higher to meet seismic code requirements.
- Optional unit locking mechanism is available.
- Electrostatic dissipative paint finish is available.
- Forklift channels are on the base of cabinets. Because these cabinets are used in industrial settings, they are designed with an integral forklift base that permits inserting truck forks for safe, easy transport of cabinets when fully loaded—a handy feature during major library moves.
- These cabinets are lifetime guaranteed.

Cabinets are available in a variety of widths and depths:

- 22 1/2" wide by 27 3/4" deep
- 30" wide by 27 3/4" deep
- 45" wide by 27 3/4" deep
- 60" wide by 27 3/4" deep

- 36 7/8" wide by 19" or 25" deep

Equipto outlines three steps for customizing modular drawer cabinets:

1. Select the frame needed: 29", 33 1/2", 44", or 59" high.
2. Select drawers to fit in the cabinet frame. Drawers are available in 200- and 400-pound capacities. Drawer heights available are:

<i>Front</i>	<i>Useable</i>
12"	11 1/4"
10 1/2"	9 3/4"
9"	8 1/4"
7 1/8"	6 3/4"
6"	5 1/4"
4 1/2"	3 3/4"
3"	2 1/4"

To make mixing and matching different drawer heights in a single cabinet easier, each frame height and drawer height is given a point value. The total points of the drawers selected must equal the point value of the frame used.

3. Select any divider needed for the cabinet; one divider type can be ordered for the entire cabinet or a different divider may be used for each drawer. Figure 7 shows the types of divider configurations available for a 30" wide by 27 3/4" deep cabinet drawer.

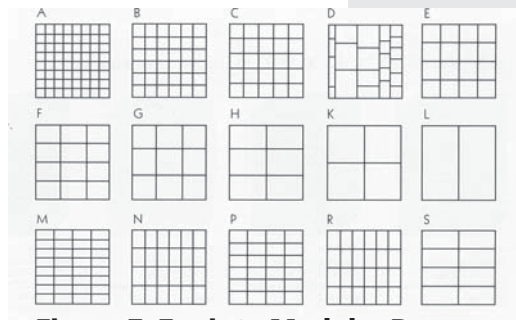


Figure 7. Equipto Modular Drawer Divider Configurations

JB Engineering, Inc. (JBE)

JBE manufactures lateral and vertical storage cabinets for multimedia (see Figures 8, 9, 10).

Lateral storage cabinets

The lateral storage cabinets have the following features:

- Dimensions: 43 1/2" wide by 19" deep, available in two heights, 29 7/8" and 57 1/2".
- The taller model, 57 1/2", is available with either eight or 10 drawers.
- Drawer features:
 - o Dimensions: 40 1/2" wide by 17 1/8" deep, available in two heights, 6 3/8" and 5".
 - o The drawers contain flexible partitioning rods adjustable on 1/4" increments.
- Each cabinet has five partition rods and one label holder per drawer.
- Heavy-duty Accuride® full suspension with Class A interlock for anti-tip safety and durability.
- Optional Bookend Media Compressor®

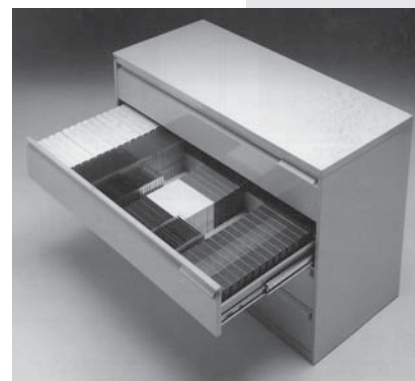


Figure 8. JBE Media Storage

JBE specifically lists Accuride®, manufactured by others, because the company considers this product the highest quality in the industry.

Cabinets 29 7/8" and 57 1/2" high	
CD: Jewelcase=336; caddy=432; Envelope=1,960	DLT: 153
VHS: Disney Case=60; Hardcase=70	4mm (DDS/DAT): 324
Audio: 1/8" video cassette=234	8mm (video/audio): 220
Betacam (small): 72	3 1/2" floppy: 1,320

Figure 9. JBE 4- and 8-drawer cabinets—media capacity/drawer

Cabinet 57 1/2" high with 10 drawers	
CD: Envelope=1,960	DLT: 153
VHS: Hardcase=70	4mm (DDS/DAT): 324
Audio: 1/8" video cassette=234	8mm (video/audio): 220
Betacam (small): 72	3 1/2" floppy: 1,320

Figure 10. JBE 10-drawer cabinet—media capacity/drawer

Vertical storage cabinets

JBE's vertical storage cabinets are designed for microfilm and microfiche. They have the following features:

- Dimensions: Cabinets are available 57 1/2" high by 28 1/2" deep. They are available in two widths, 21 1/4" for microfiche and 23 3/4" for microfilm.
- Cabinets are constructed with heavy-duty Accuride full suspension with Class A interlock for anti-tip safety and durability.
- Drawer fronts have inset handle pulls with a label holder.
- Microfiche cabinets
 - o 10 drawers with lock
 - o Each drawer can store 14,580 5-mil microfiche in three rows front-to-back
 - o Maximum media size is 6 1/4" wide by 4 3/4" high
 - o Includes 120 EQ-Tilt Indexers (makes drawer contents easy to read)
- Microfilm cabinets
 - o 11 drawers with lock
 - o Each drawer configured to store 135 16mm or 80 35mm microfilm cartridges in five rows front-to-back
 - o Optional Place Keepers to support media and hold open spaces
 - o One Bookend Compressor per cabinet is included

Construction of all JBE cabinets includes these features:

- All prime cold-rolled furniture-grade steel
- All welded construction
- 16-gauge steel frame
- Lateral suspensions have 180-pound capacity per drawer
- Highly durable baked enamel or powder-coat finish

JBE warrants its products to be free from defects in material and workmanship for a period of five years after being put into service by the original purchaser of the equipment.

Cabinets, flat files for large documents

For many years, libraries have used flat files to store maps. In addition, these cabinets also are used to store architectural and engineering large drawings, x-rays, art prints and drawings, and posters.

Two of the companies that provided these file cabinets were American Hamilton and Mayline Group. Today, the Mayline Group produces both the Hamilton and the Mayline cabinets listed under its plan file products. Two other companies now also provide flat files: Safco Products Co. and Bradford Systems.

Mayline Group

Mayline Group, established in 1939, offers its Hamilton Unit System as a high-capacity filing system. The flat file cabinets are available for storing various large-sized formats (see Figure 11 for equipment sizes and configurations).

	Overall unit sizes			Inside drawer sizes		
	Width, in.	Height, in.	Depth, in.	Width, in.	Height, in.	Depth, in.
For 24x36 formats						
5-drawer file	43 5/16	15 3/8	32 1/2	39 1/2	2	29
10-drawer file	43 5/16	15 3/8	32 1/2	37 1/2	3/4	29
For 30x42 formats						
5-drawer file	49 5/16	15 3/8	38 1/2	45 1/2	2	35
10-drawer file	49 5/16	15 3/8	38 1/2	43 1/2	3/4	35
For 36x48 formats						
5-drawer file	55 5/16	15 3/8	44 1/2	51 1/2	2	41
10-drawer file	55 5/16	15 3/8	44 1/2	49 1/2	3/4	41
For 42x72 formats						
5-drawer file	79 5/16	15 3/8	50 1/2	75 1/2	1 1/2	47

Figure 11. Mayline's Hamilton Flat File Dimensions

Mayline's flat files are steel construction with extra-strength drawer rails and heavy steel side-roller assembly with case-hardened ball-bearing rollers for smooth, quiet operation of drawers. Positive closure keeps drawers tightly shut and courtesy stops keep them in place when in an open position. A rear hood and hinged front depressor protect contents. Paint finish is museum-archival quality.

Other features include:

- 50-pound capacity per drawer
- Lock option
- Five-year warranty
- Interlocking steel files designed for ease of stacking
- Capacity is 1,000 sheets vellum per 10-drawer file
 - o 200 sheets per drawer in the five-drawer file

A **tracing** is an original architectural or engineering drawing made on tracing paper that is more fragile than vellum and other standard architectural/engineering prints.

- o 100 per drawer in the 10-drawer file
- o Using plastic, magnetic drawer dividers to arrange five-drawer files, for drawers 1/2, 1/4, and 1/8 of the design size increases drawer capacity.
- Plan file portfolio (for keeping sets of maps and plans together in a drawer)
- Two base styles (choose open or closed base for preferred aesthetics)
- Drawers with front metal plan depressor and rear hood to keep documents flat and orderly
- Dust covers
- 10-drawer files only with a tracing lifter, over which top-of-stack tracings are draped for ease of nondamaging retrieval of those underneath (see Figure 12).



Figure 12. Mayline's Hamilton Tracing Lifter

Mayline also produces other cabinets for the same sized sheets with slight variations in size and accessories. One of these is its Museum Files. These units are self-contained with an integral cap that can be bolted together for stacking. Drawer suspension uses greaseless nylon rimmed ball bearings to eliminate metal-to-metal contact and abrasion. The paint finish is formulated to prevent out-gassing.

For all manufacturers' flat files, when stacking the units and adding a base and a cap, the overall height approximates the following:

- Two units stacked—40" high
- Three units stacked—56" high
- Four units stacked—72" high

Safco Products Co.

Safco Products Co. also produces flat files for large documents. This company is a division of Liberty Diversified Industries and was founded more than 35 years ago. It manufactures five-drawer steel flat files for documents 24"x36", 30"x42", and 36"x48". It also makes a 10-drawer file for 30"x42" documents.

The cabinet finish is museum/archival quality paint. The equipment has a five-year warranty.

Cabinets, vertical files for large documents

Joanne M. Perry, map librarian, Oregon State University, listed her primary reasons for preferring vertical storage for maps in an article published in *Special Libraries*, vol. 73, no. 3, pages 207-212, July 1982:

- Reduction of physical damage to the maps
- Increased ease of access to the collection
- Reduction of time needed for filing
- Increased storage capacity

Other reasons that can be added to her list are the substantial space-savings, especially significant for large collections, and reduced weight that will benefit those in buildings with low floor-loading capacities.

This article is excellent and useful. Perry not only notes additional benefits of this type system but also describes how to properly use the vertical filing system to achieve maximum performance from it.

Ulrich

Ulrich has been manufacturing vertical filing systems since 1915. Six types of vertical files are available: the Planfile, Planfile 2, Minifile, Cadfile, Drawerfile, and Pinfile.

Planfile (see Figure 13) features:

- Active filing for up to 3,600 documents in sizes up to 36"x56"
- Easy to use because all filing is done at waist height
- Holds and protects documents using a unique spring compression system and heavy-duty folders. This spring compression system with its reinforced folders holds documents smoothly and securely while allowing for easy retrieval.
- Standard folders have Mylar-reinforced hand holes. Available customization can provide folders to hold several different sized maps, engineering plots, architectural drawings, or any documents in one cabinet.
- Two-point locking system for security
- Double-wall, steel construction, and fire-resistant insulation
- Heavy-duty, lockable, removable casters for mobility
- Manufactured in different cabinet sizes to hold maximum of 60 folders for the following sheet sizes:

24"x36"	30"x42"	36"x48"	36"x56"
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- Accessories
 - o Convenience step that folds up when not needed
 - o Filler pocket made-to-order to shorten compression pocket depth for small folders



Figure 13. Ulrich Planfile

- o Stub folder used when various folders are in the same compression pocket
- The Planfile cuts floor space requirements by up to 66%. Filing is done from the opened top. Flat file drawers require at least 50 inches directly in front of the cabinet when the drawers are open and a person is putting material in or taking it out of them.
- Because Planfiles are high capacity, they cost less per sheet filed than other filing systems (see Figure 14).

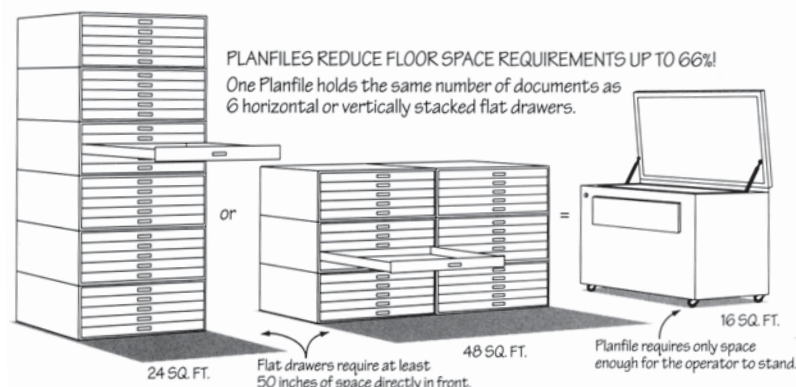


Figure 14. Flat files vs. Planfile Floor Space Requirements

Planfile 2 is an economy version of the Planfile in a single-wall construction where fire resistance is not required. Its features include:

- Manufactured in different cabinet sizes to hold maximum of 50 folders for the following sheet sizes:
24"x36" 30"x42" 36"x48"
- Planfile 2 cuts floor space requirements by up to 67%.
- All other features are the same as the Planfile (see Figure 15).

Part #	Max. sheet size	# of folders	Capacity Active	Capacity Inactive	Folder number	Cabinet dimensions Height, in.	Width, in.	Depth, in.	Approx. ship wt. lbs.
Planfile									
3624	24x36	60	3,600	6,000	9,065	35 3/4	43 3/4	31 1/2	490
4230	30x42	60	3,600	6,000	9,067	42 3/4	49 3/4	31 1/2	598
4836	36x48	60	3,600	6,000	9,068	45 3/4	55 3/4	31 1/2	715
5636	36x56	60	3,600	6,000	9,080	45 3/4	63 3/4	31 1/2	860
Planfile 2									
EC3624	24x36	50	3,000	6,000	9,065	35 3/4	43 3/4	31 1/2	450
EC4230	30x42	50	3,000	6,000	9,067	42 3/4	49 3/4	31 1/2	527
EC4836	36x48	50	3,000	6,000	9,068	45 3/4	55 3/4	31 1/2	596

Figure 15. Ulrich Planfile and Planfile 2 storage Capacities

Minifile has the fire resistance and water resistance of the Planfile but in a unit of smaller capacity. Its features include:

- Manufactured in different cabinet sizes to hold a maximum of 24 folders for the following sheet sizes:
24"x36" 30"x42" 36"x48"
- All other features are the same as the Planfile.

Cadfile is a vertical filing system designed for CAD workstations. It provides filing for drawings up to 24"x36". Its features include:

- Easy to use: open the flip-over lid (which becomes a shelf) and pull out the required file.
- Holds 1,000 24"x36" documents in 20 folders.
- Optional casters provide mobility.
- Cadfile cuts floor space requirements by up to 75%. Flat drawer files require 24 square feet of space with the drawer open, not including space required for operator. Cadfile requires only 5.8 square feet of space with the lid open.
- All other features are the same as the Planfile.

Drawerfiles (see Figure 16) are used for storing documents up to 18" by 24". They can be used for filing maps, drawings, x-rays, printing plates, and special films. Ulrich's unique suspension system is rated for 500 pounds per drawer. The drawers open fully for easy access to the rear of the drawer and offer the same compression system found in the Planfiles.

Drawerfiles are available in two-drawer or three-drawer styles. The two-drawer units accommodate documents up to 18" by 24" and the three-drawer unit holds a maximum document size of 12" by 18". Multiple-size documents can be stored together in a single unit.

Both cabinet styles feature an anti-tip mechanism that allows only one drawer to be opened at a time. Key locks are available.

Part #	Max. sheet size	# of folders	Capacity		Folder number	Cabinet dimensions			Approx. ship wt. lbs.
			Active	Inactive		Height, in.	Width, in.	Depth, in.	
3-drawer									
1172	9x12	336	16,800	33,600	29,069.5	51 7/8	23 3/8	24 3/8	420
*1173	9x12	336	16,800	33,600	29,069.5	51 7/8	23 3/8	24 3/8	420
1174	12x18	168	8,400	16,800	29,069	51 7/8	23 3/8	24 3/8	407
*1175	12x18	168	8,400	16,800	29,069	51 7/8	23 3/8	24 3/8	407
2-drawer									
1180	18x24	112	5,600	11,200	29,064	51 7/8	29 1/4	24 3/8	420
*1181	18x24	112	5,600	11,200	29,064	51 7/8	29 1/4	24 3/8	420
*includes a lock									

Figure 16. Ulrich Drawerfiles Storage Capacities

Pinfile is a vertical filing system that operates differently from Planfiles. To use this equipment, the following steps are taken:

1. Open the cabinet top and use the indexing system mounted on its underside to find the map, drawing, or other flat sheet housed in the file.

2. Lift the release knob and lightly glide-open the front of the cabinet until it stops at the reference position. In this position the pins remain overlapped to ensure no document can fall off.
3. After the document has been found and centered, lift the release knob again and open the cabinet front fully. Slide the document off the pins and out either side of the cabinet.

Features of the Pinfile are:

- Closed depth of this file is 19 1/2"; open depth is 31".
- Available in three sizes:
 - o 42 1/8" high by 34 1/2" wide for 24"x36" maximum sheet size
 - o 54 3/8" high by 42 1/2" wide for 30"x42" maximum sheet size
 - o 42 1/8" high by 61 1/2" wide for 36"x48" maximum sheet size
- Buttons on the face of the cabinet provide temporary storage for a document while the cabinet is being open and closed.
- Two available pin configurations are available:
 - o Pin and post
 - o Parallel pins



Figure 17. Ulrich Pinfile Detail

In comparing the use of the Pinfile (see Figure 17) with the other Ulrich vertical files, the Pinfile is accessed from the top and at least one side while the other files are accessed only from the top, thus increasing the floor space required by an individual Pinfile and significantly reducing the space efficiency of using multiple units.

Accessories required for use of this system include suspension tape, available in designs for both pin configurations, and divider strips. The suspension tape is affixed to the object to be stored. Another company, Easi File, has envelopes so you don't need to affix tape to the documents stored in this type file.

Part #	Max. sheet size, in.	Capacity	Pin-style	Height, in.	Width, in.	Closed depth, in.	Open depth, in.	Approx. ship wt., lbs
M24	24x36	1,200	Parallel	42 1/8	34 1/2	19 1/2	31	245
M30	30x42	1,200	Parallel	54 3/8	42 1/2	19 1/2	31	350
M48	36x48	1,200	Parallel	42 1/8	61 1/2	19 1/2	31	390
MP24	24x36	1,200	Pin & post	42 1/8	34 1/2	19 1/2	31	245
MP30	30x42	1,200	Pin & post	54 3/8	42 1/2	19 1/2	31	350
MP48	36x48	1,200	Pin & post	42 1/8	61 1/2	19 1/2	31	390

Figure 18. Ulrich Pinfile Storage Capacity

Pinfile

Easi File also manufactures a pinfile. It has manufactured vertical files for more than 32 years. To use this equipment, perform the following steps:

1. Unlock the file and pull the door open. The lid opens automatically.
2. Sort through the hanging items, sliding them forward.
3. To open, hold the door handle, release the stop lever, and pull.
4. Remove the item through the side.
5. Push the door back to the intermediate position.
6. When complete, push all items to the rear, release the stop lever, and close the file.

Features of the Easi File Pinfile include (see Figure 18 for capacities):

- Space savings are 75% over conventional flat files.
- Visibility: All identification is at eye level and the full face of the document can be viewed without removal.
- Ease of operation: No bending or stooping is necessary. All retrieval is done at standing level.
- Prefiling posts are provided on the front of the door for temporary storage.
- Envelopes: This system uses anti-static polyethylene envelopes supplied with hangers attached so stored items do not require any modification to be housed in these cabinets. The manufacturer recommends an acid-free backing, such as foam core, be inserted in the envelope together with the map or other large sheet to be stored so it won't collapse on itself.

The polyethylene envelope is a stable material that does not off-gas and is used for archival storage at such institutions as the Denver Art Museum, the Douglas Public Library in Colorado, and libraries at Brigham Young, Harvard, Duke, Stanford, and Utah State universities, and campuses of the University of California system, including Santa Barbara, San Francisco, Los Angeles, and San Diego.

- The envelopes are available in two styles, top or side entry.
 - o The top entry envelope is suspended from two hanger strips allowing documents to be inserted and removed from the top. This envelope style is used especially for larger documents.
 - o Side entry envelopes are suspended from a single hanger strip. This style is available in both single and multicompartment design.
- Staple strip: Instead of an envelope, a heavy-duty plastic self-adhesive staple strip, designed for stapling to prints gathered together in sets, may be used. The strip is prepunched and has an offset identification tab.
- Divider cards, made of semistiff plastic, provide a method of separating groups of materials. They also are used to slide groups of items from front to back while sorting.
- Out card is a polyester strip designed to replace documents when they are removed from the file. The strip extends above the normal hanger strip and is indicated with a bright red Out label.

- Rod clamp: Instead of the pin configurations available for Ulrich's pinfile, Easi File uses a rod clamp. When the envelopes are full of documents, they become thicker than the hangers and cause the hangers to walk off the rods when the door is fully open. The clamp secures the envelopes on the front door rods to prevent sliding. The clamp is not required for normal document filing.
- Security: Built-in locks are standard on Easi File cabinets. A security bar also can be used to protect especially valuable documents.

Part #	Capacity	Max. drawing size	Height, in.	Width, in.	Depth, in.	Weight, lbs.
EF50	1,250	24x41	47	27	18	210
EF100	1,250	34x44	50	37	18	280
EF200	1,250	36x48	54	39	18	320
EF300	1,250	44x60	50	63	18	475
EF400	1,250	44x72	50	75	18	540

Econo File

The Econo File is a lower-cost, utility version of Easi File's pinfile. It is ideal for applications requiring storage of a small quantity of documents. This file is equipped with casters for mobility.

Figure 18. Easi File Pinfile Storage Capacities

Shelving, racks, slat walls

Most shelving manufacturers now provide a variety of shelf types and accessories that attach to their frames to hold all types of media.

Public libraries have led the way in merchandising their media collections by using display equipment initially developed for retailers. This display equipment consists of A-frame shelving, slat walls, and numerous combinations and variations of shelving and slat walls. Public librarians found that multimedia collections weren't used unless the collections were displayed the way commercial establishments present them.

Display equipment manufacturers, such as Lift and PS Professional Store, have taken the design of their display systems one step further by developing scan-and-play music and video preview systems that naturally fit into their storage systems.

Their philosophy is that today's culture is interactive. If libraries wish to attract patrons, libraries must provide an attractive, stimulating environment. Listening to a CD or viewing a DVD before taking it home is part of that stimulation. Librarians are beginning to recognize the importance of interaction.

Security is a major problem for multimedia collections. Many libraries that have inadequate staff to page multimedia from a locked room or from behind a service desk, as well as for those that want to merchandise their collections, they have turned to individual, clear, locked security cases that can be security taped.

These cases are available for all types of media, including videos, CDs, and DVDs. Library users take the cases to the circulation desk where they are unlocked and the items checked out to the patron.

One example of this kind of security case used by libraries for multimedia is Kwik Case®, manufactured by Gressco. Others are those cases manufactured by ProLoc. Demco alone carries six brands of security cases, each a slightly different size.

The variations in size for one-type-medium cases may create a problem when selecting multimedia storage equipment. The cases reduce the number of items that can be housed thus requiring the purchase of additional equipment. In addition, for media such as CDs and DVDs held upright by grooves, all cases will not fit in all groove sizes used by all manufacturers. Some manufacturers, though, will customize the size of the grooves if given the case size in advance.

The criteria for selection of a specific security case are:

- Durability of case
- Physical changes over time, such as yellowing
- Visibility of medium stored in case
- Release mechanism, ease of opening the case
- Security level provided by the case, such as tamper-resistance features
- Number of case sizes required to protect multimedia collections (Some manufacturers require five case sizes to protect 95% of collections; others may require 18 sizes to protect the same collections.)
- Compatibility with all types of security systems and tagging methods (For example, one design allows for security tags to be placed inside the case, which is closed on six sides, preventing access to the case's interior.)
- Cost

Academic libraries tend to emphasize storage of large collections, especially storage of multimedia masters, though many of these libraries also have collections directly accessible by their public. When storage is the emphasis, the concern is to house the maximum number of items in the smallest space.

To accomplish this emphasis, libraries search for the smallest containers to house the specific item or group of items. For example, one academic institution uses boxes manufactured by Polyline. That company makes CD and DVD boxes thinner than the standard jewel case.

Libraries also tend to group five to 10 items in a set in a single box to increase storage efficiency. Academic institutions use many high-density storage systems.

Whether in public, academic, or any other type of library, display equipment enhances public service for multimedia collections. The criteria for selecting display equipment include the following:

- Maximum visual access to individual items, face out when possible
- High media capacity
- Ease of mobility when required, equipped with casters
- Durable
- Ease of adaptability for use with different media, especially for unknown future needs
- Maximum access for multiple users
- Minimum staff required to provide maximum public service
- Smallest footprint
- Ease of identification—signs and labels
- Appropriate access height, not too low or too high

MC is the German equivalent of an audiocassette.

Lift Display, Inc.

Established in Austria in 1983, Lift Display, Inc., patented Lift Profile® to display large quantities of CDs in a small rack occupying a small footprint that the users could browse with their fingertips. Today this European company's product line has expanded to display all types of media, including CDs, MCs, DVDs, video, software, books, newspapers, and magazines.

Lift's fixtures are made of steel or aluminum, wood, and plastic. Their designs are modular, giving them flexibility and adaptability.

Lift has a line of display fixtures called Performance® designed to adapt to new media formats. The fixture system offers optimum view of the media and provides the highest display capacity on minimum floor space. This system employs three components:

- Full-face
 - o Full-face display
 - o Space efficiency
 - o Product application: CD/CD-ROM, paperback/VHS, DVD, laserdisc, magazine
- Zigzag (see Figure 19)
 - o Displays both title page and spine of media
 - o Functions in both a 45° equilateral or a 24° wide-angle format
 - o Shelves inserted as needed at various heights
 - o Product application
 - 45°: CD/CD-ROM, DVD, paperback/VHS, hard-cover, newspapers, magazines, accessories
 - 24°: Magazines, art books, computer games and software, large CD-ROM covers



Figure 19. Lift Performance® system zigzag display

- Compact Slat®

Compact Slat's special feature is an exceptionally narrow profile, achieving a unique display density. The design of aluminum panels and uprights combine an extremely strong and stable display. It has an extensive selection of hooks, brackets, dedicated holders, and accessories available. Using the 10" + high panels that stack and can be cut into a variety of widths, the system can be configured in a variety of designs, including display walls with windows. The latter design was used in the Phoenix Public Library system. The Farmington Public Library in New Mexico also used this system to enclose the teen area.

 - o Aluminum
 - o Uprights
 - Wall-mounted vertical or 10° angled
 - Standard height: 80" (2,000mm)

- Angled height: 77.2" (1,930mm)
- Optional heights
- o Shelf loading capacity: 99.2 pounds (45kg)
- o Slat
 - Grooves: 8mm (0.32")
 - Slat faces: 7mm (0.28")
 - Adjustable every 15mm (3/5")
 - Slat (aluminum profiles) with uprights at 26" intervals loading capacity: 176.4 pounds (80 kg). Varying the upright interval has an effect on load-carrying capacity.
- o Horizontal panels 25 cm high (9.75") stacked to desired height
- o Double or single sided
- o Maximum length: 13'4"
- o Ideal handling size: 10' to avoid vertical seams in the display wall
- o Application universal
- o Highest item density
- o Shelves, hooks, and dedicated holders can be attached at 1/2" intervals

Lift's Slat Shop® system provides for arrangements of products on a compact island floor rack. The 120° angled configuration increases the amount of display area possible with standard types of linear display systems.

Features of this system are:

- 120° angled configuration
 - o Double sided
 - o Aluminum
 - o Dimensions
 - Height: 5' (Six Compact Slat® panels stacked)
 - Width: 4'8"
 - Bay length (distance of course that includes one angle from point to point): 8' (if a straight course, it would be 8'16", the width of two panels)
 - o Choice of powder-coated or anodized surface
 - o Accessories such as hooks; slotted shelves for CDs, VHS, and DVDs; chart shelves; and film shelves
- Individual accessories can be positioned at proper ergonomic height in 3/5" (15mm) vertical steps
- Cables run inside the panel
- Shelving available in metal, wood, and Perspex (clear plastic)
- Castors optional

The Performance® system is available in two formats:

- Wall racks: Height 6'6", width variable
- Gondolas: Height 4'6", width variable

Its latest fixture line, Vision II®, uses a laminate finish that is integrated with stainless steel frames and sign holders and is ergonomically designed to better display media.

The Vision® fixture can be set up in circles, arcs, staggered, or in the classic end-to-end arrangement. Vision is available in wall or freestanding displays that can be easily rearranged. Other features of Vision:

- Fixed base or castors
- Dimensions
 - o Length: 39 1/3"
 - o Three standard heights
 - 47 1/4"
 - 59"
 - 70 9/10"
- Displays
 - o Straight top extends height by 17 1/2".
 - o Double top extends height by 29".
 - o Oriented either inclined or straight
 - o Lighting spots mounted directly on displays
- Side covers for listening stations, reading desks, or shelves
- Easily adaptable to new products since the orientation and type of shelving can be easily altered

Gressco Ltd.



Figure 20. Gressco Ltd. Mar-Line® End-of-range Cleveland CD Display

Gressco has CD and DVD displayers. These displayers are designed to hold the media in an upright position by using one of three methods:

- Flipper Tracking®System—Bottom of drawers have metal grooves.
- Slider Block System—A block slides forward to eliminate empty spaces.
- Nonslip tray has adjustable acrylic dividers.

It manufactures four models for CD display. The end-of-range Mar-line® Cleveland CD Display (see Figure 20) is placed at the end of a bookshelf and is constructed of oak. It has a top stationary drawer and three pullout drawers that hold 240 CDs using the Flipper Tracking System. It measures 23 1/2" wide by 19 1/4" deep by 42" high.

Other models are larger in size and have options of adding a drawer and using either the Flipper Tracking System or a Slider Block System to hold the CDs upright.

Gressco's DVD display equipment is available in a three- or four-drawer version.

- Three-drawer characteristics
 - o Wood construction
 - o Capacity: 207 DVDs
 - o Top drawer stationary, bottom two drawers pull out
 - o Slider Block System to hold DVDs upright
 - o Dimensions: 45" wide by 20" deep by 37" high
- Four-drawer characteristics
 - o Melamine construction
 - o Capacity: 480 DVDs
 - o Top drawer stationary, bottom three drawers pullout
 - o Equipped with nonslip tray with adjustable acrylic dividers to hold DVDs upright
 - o Dimensions: 45" wide by 22" deep by 42" high

Texwood

Texwood, founded in 1959, has two styles of multimedia display shelving. One has pullout drawers. Its American series library furniture carries a five-year warranty.

The CD Displayer holds up to 480 DVDs (see Figure 21). This unit measures 37 3/4" wide by 47" deep by 55" high and is double-sided with five 18-gauge powder-coated steel shelves per side and six adjustable dividers per shelf. The shelves are set at a slight angle to allow easy viewing. The ends of the unit are 1" thick multiply veneer core with 1/4" solid oak edges. Combining starter and adder units can expand this equipment.

Texwood's CD/DVD displayer with pullout drawers holds up to 700 CDs or 500 DVDs. This equipment is constructed of multi-ply veneer core with premium red oak veneers and banded in solid oak. It is single-sided, pyramid-shaped for stability.

This unit has four drawers, three are pullout and one is stationary, with space between each drawer that allows for storing either CDs or DVDs. The drawers are 18" deep with five sections and movable dividers that hold cases in an upright position.

This equipment measures 36" wide by 24" deep by 45 1/2" high. Combining starter and adder units also can expand it.

ProLoc North America, Inc.

ProLoc manufactures CD and DVD display units available in an extensive range of counter units, A-frames (see Figure 22), gondolas, and carousels (spinners). Its single and double-sided gondolas can be manufactured in a wide choice of shapes, finished to match existing displays, or custom designed. Standard units

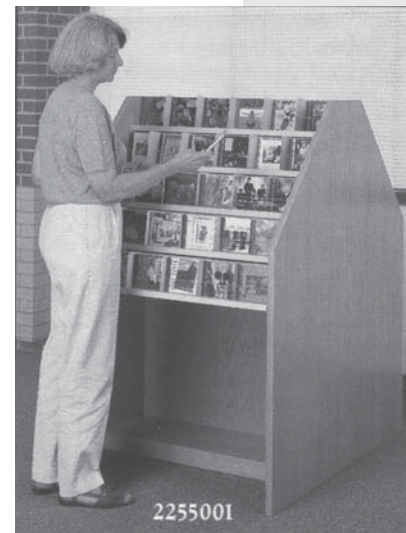


Figure 21. Texwood CD Displayer

can be supplied with optional cupboards (usually not a public library preference), drawers, or shelves. Features of these units are:

- Aluminum shelving with movable divider clips for both DVDs and CDs or a shelf with zigzag for DVDs
- Shelves constructed in sets of two, with lower shelf stepped forward of higher shelf for ease of fingertip browsing (Shelf placement was ergonomically designed so that each set of shelves, from top to bottom of unit, steps forward of the previous set, providing ease of access to all material without having to stretch or stoop.)
- Movable divider clips on shelves to keep media organized and at the same time allow for future industry packaging changes
- Extensive range of metal and acrylic accessories



Figure 22. ProLoc A-frame displays

- Starter-adder concept for affordable units of custom lengths
- CD units available in adult and children's heights; DVD unit only for adult height
- End panels that can be custom designed and are available in most laminate or veneer finishes (End panels may be constructed of slat walls to hold additional items or for other display.)
- Locking castors, concealed or not, on all units
- Leveling feet
- Signage holder with blank sign
- Dimensions of CD gondolas
 - o Adult
 - Single-sided: 4'11 1/8" wide by 24 3/8" deep by 4'8 1/4" high
 - Double-sided: 4'11 1/8" wide by 3'11 1/4" deep by 4'8 1/4" high
 - o Children
 - Single-sided: 4'11 1/8" wide by 18" deep by 4'1 3/8" high
 - Double-sided: 4'11 1/8" wide by 2'11 3/4" deep by 4'13/8" high
- CD single- and double-sided gondola capacity
 - o Adult
 - Shelf capacity
 - o 10 CD faces across each shelf using standard CD packaging
 - o Nine CD faces across each shelf using ProLoc CD security cases
 - o Nine CDs deep with standard CD packaging
 - o Six CDs deep with ProLoc CD security cases
 - 12 shelves total, six per side
 - 1,080 CDs without security cases (540 per side)
 - 648 CDs with ProLoc security cases (324 per side)
 - o Children
 - Eight shelves total, four per side

- 720 CDs without security cases (360 per side)
- 432 CDs in ProLoc security cases
- Dimensions of DVD gondolas for adults only
 - o Single-sided: 4'11 1/8" wide x 27 1/2" deep x 4'9" high
 - o Double-sided: 4'11 1/8" wide x 4'7 1/8" deep x 4'8 1/4" high
- DVD single- and double-sided gondola capacity for adults only
 - o Shelf capacity
 - 10 DVD faces across each shelf using standard DVD packaging
 - Nine DVD faces across each shelf using ProLoc DVD security cases
 - Seven DVDs deep with standard DVD packaging
 - Four DVDs deep with ProLoc CD security cases
 - o 10 shelves total, five per side
 - o 700 DVDs without security cases (350 per side)
 - o 360 CDs with ProLoc security cases (180 per side)

ProLoc manufactures a slat wall system called MicroSlat®. This system is a 1" pitched aluminum slat wall system suitable for light and heavy items and high-capacity applications. All manufacturers' slat wall accessories can be used with ProLoc's MicroSlat system. It is available in single- and double-sided profiles and in the following configurations:

- Wall-mounted display shelving
- 10° sloping display and shelf wall system
- Bookstack end panels
- A-frame displayers
- Custom-built displayers

MicroSpan® uses MicroSlat in a columnar configuration (see Figure 23). Columns are available in standard or custom widths and can be backlit for special applications. Shelves and special fixtures span between or are attached to the MicroSlat columns.

ProLoc's A-frame multimedia display unit with aluminum MicroSlat can be used with any standard slat wall accessory (see Figure 24). The shelves are adjustable on 1" increments. The units are available in adult and children's heights.

Adult height unit features include:

- Dimensions: 4'8" long by 3'8 1/2" overall width across base shelves (2'4 1/2" wide at base excluding shelves) by 5'3" high
- Shelves
 - o Six shelf levels (two shelves/level) per side
 - o Top five levels of shelves—acrylic plastic
 - o Bottom level base shelves—metal and measure about 27 1/2" long by 7 7/8" deep
- Capacity

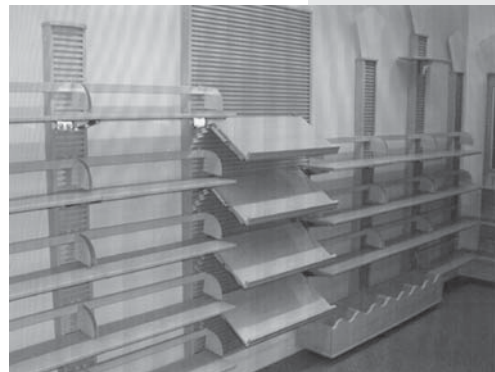


Figure 23. ProLoc MicroSpan system



Figure 24. ProLoc MicroSlat A-frame in Tippecanoe County Public Library, Lafayette, Indiana

- o Video capacity for five deep (standard packaging) in a zigzag space
 - Three zigzag spaces per shelf
 - 180 videos per side (360 total)
- o Video capacity of six deep (cardboard sleeves) in a zigzag space: 216 videos per side (432 total)
- o Video capacity with ProLoc security cases
 - Four videos deep
 - 144 videos per side (288 total)
- o CD capacity in standard jewel cases in zigzag space: 540 CDs per side (1,080 total)
- o CD capacity in ProLoc security case
 - Nine CDs deep
 - 324 CDs per side (648 total)

- o DVD capacity in standard case in a zigzag space
 - 10 DVDs deep
 - 360 DVDs per side (720 total)
 - Shelved spine out: 45 to 46 per shelf, 540 per side
- o DVD capacity in ProLoc security case: 252 DVDs per side (504 total)

Children's height unit features include:

- Dimensions: 4'8" long by 3'8" (across base shelf) wide by 54" high.
- Shelves
 - o Five shelf levels (two shelves/level) per side
 - o Top four levels of shelves—acrylic plastic
 - o Bottom level base shelves—metal and measure about 27 1/2" long by 7 1/2" deep
- Capacity
 - o Video capacity for five deep (standard packaging) in a zigzag space
 - Three zigzag spaces per shelf
 - 150 videos per side (300 total)
 - o Video capacity of six deep (cardboard sleeves) in a zigzag space: 180 videos per side (360 total)
 - o Video capacity with ProLoc security cases
 - Four videos deep
 - 120 videos per side (240 total)
 - o CD capacity in standard jewel cases in zigzag space: 450 CDs per side (900 total)
 - o CD capacity in ProLoc security case
 - Nine CDs deep
 - 270 CDs per side (540 total)

- o DVD capacity in standard case in a zigzag space
 - 10 DVDs deep
 - 300 DVDs per side (600 total)
 - Shelved spine out: 45 to 46 per shelf, 450 per side
- o DVD capacity in ProLoc security case: 210 DVDs per side (420 total)

PS Professional Store

PS Professional Store, founded in Germany, has specialized in manufacturing displays for music and video for more than 20 years (see Figure 25).

It compares its system with a Leggo® set since all its component parts are interchangeable. The company can easily change the width, length, height, and capacity of the equipment. The result is a custom product at production line prices.

Because it is primarily a metal fabricator, PS can easily modify components that may require a change in size, shape, or color so it can produce custom equipment.

A main feature of this flexible system is its unique perforated shelf. The company designed a plastic divider to snap down into the perforations to separate the media on the shelf. This design makes possible putting anything on the shelf by merely moving the divider. If desired, you can place CDs, cassettes, and videos together on the same shelf.



Figure 25. PS Professional Display in Schaumburg Public Library, Schaumburg, Illinois

Borroughs

The Borroughs Corp. manufactures Wilsonstak® cantilever library shelving. It manufactures special purpose shelves (examples include Figures 26 and 27) for multimedia that are interchangeable within the standard book shelving system. These shelves are hung on standard bookstack unit widths of 36" and 30".

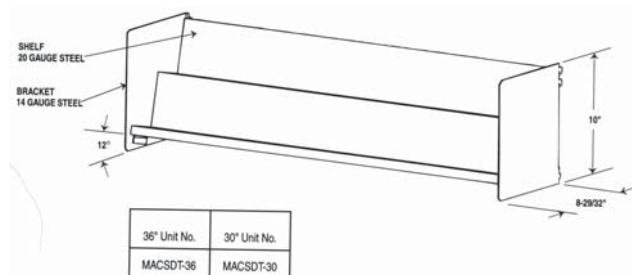


Figure 26. Borroughs Wilsonstak® Double-tier Cassette Shelf

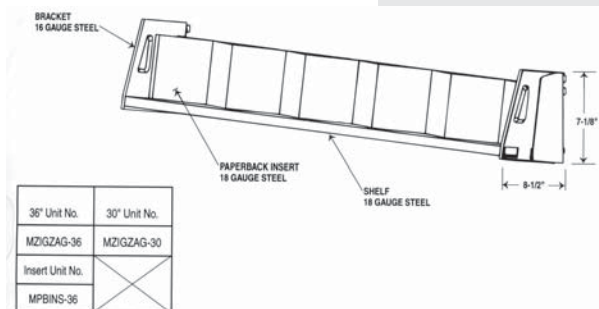


Figure 27. Borroughs Wilsonstak® Zigzag Paperback Shelf

Borroughs recommends using a 4" or 6" deep shelf for housing microfilm and planning for a capacity of seven per linear foot of shelf. A shelf spacing guide follows in Figure 28.

Shelf spacing guide

This chart shows maximum quantity of adjustable selves and proper shelf spacing for different type shelves, based on different height frames.

For closed-base bookstack

Maximum adjustable shelves per frame face

Shelf type	Min. spacing required between shelves, in.	# of shelves without canopy top								# of shelves with canopy top							
		42"	54"	66"	78"	84"	90"	93"		42"	54"	66"	78"	84"	90"	93"	
Standard adjustable or divider type shelf	8	4	5	7	8	9	10	10		3	5	6	8	8	9	10	
Storage shelf 12" or 15" with reverse bracket	4	8	11	14	17	18	20	20		7	10	13	16	17	19	20	
18" heavy-duty w/top bracket	5	6	8	11	13	14	16	16		5	8	10	13	14	15	16	
Fixed periodical shelf only	9	3	4	6	7	8	8	9		3	4	5	7	7	8	8	
Alternating fixed periodical and 12" storage (allows 2" above storage shelf)		2-1	3-2	4-3	4-3	4-3	5-4	5-4		2-1	2-1	3-2	4-3	4-3	5-4	5-4	
Hinged periodical 12" or 16" depth	14	2	3	4	5	5	6	6		2	3	4	5	5	6	6	
Sloping media ZigZag (MZIGZAG) Media shelf single (MSAVS)	9	3	4	6	7	8	8	9		3	4	5	7	7	8	8	
Microfilm shelf	5	6	8	11	13	14	16	16		5	8	10	13	14	15	16	
Phono, record & picture book shelf	14	2	2	3	4	4	5	5		2	2	3	4	5	5	6	
Media shelf double tier (MCSDT)	13	2	3	4	4	5	5	5		2	3	3	4	5	5	5	
Browsing box	12	2	3	4	5	6	6	6		2	3	4	5	5	6	6	
Media hanger rack	20	2	2	3	3	4	4	4		2	2	3	3	4	4	4	
Newspaper rack holds 6	29	1	1	2	2	2	3	3		1	1	2	2	2	3	3	
Newspaper rack holds 10	37	1	1	1/1	2	2	2	2		1	1	1/1	2	2	2	2	
Universal media/display shelf																	
Flat position	8	4	5	7	8	9	10	10		3	5	6	8	8	9	10	
Sloped position	10	2	4	5	6	6	7	8		2	3	4	6	6	7	7	

Figure 28. Borroughs Wilsonstak Shelf-spacing Guide

Borroughs recommends using a 6" or 8" deep shelf for housing VHS tapes and CD-ROMs and planning for a capacity of nine VHS tapes and 27 CD-ROMs per linear foot of shelf.

The Zigzag Paperback Shelf also may be used to house VHS tapes, CD-ROMs, DVDs, or any other media that may conveniently fit in this configuration.

Its browsing boxes (a type of shelf) work well with all security case sizes.

The Borroughs Wilsonstak Storage Shelves, measuring 10"x12"x15", may be used to house newspapers folded in half and manuscript boxes. Double-faced 23" shelving may be used to house maps, posters, or other flat sheets in acid-free boxes that do not exceed 24"x36".

Montel, Inc.

Montel, Inc., founded in 1924, manufactures Aetnastak® cantilever library shelving, which is designed to house multimedia as well as books (see Figure 29). Its product features include:

- Shelf dimensions are:
 - Width: 24", 30", 36"
 - Depth: 7", 9", 11", 15"
- Base flush with top surface of bottom spreader channel, providing continuous storage surface.
- Shelves support 50 pounds per linear foot.
- Four-bend edge reduces injury risk.
- Radial edge on shelf brackets protects books.
- Connected frames form a finished enclosed tube, preventing materials being inserted into tube and being damaged.
- Kick strips adjust vertically and are recessed under the bottom shelf to provide toe space.
- Threaded levelers adjust easily.
- Shelving meets Uniform Building Code (UBC) requirements for seismic zones.

Montel has produced a new four post shelving system called SmartShelf® (see Figure 30). The company describes this system as providing infinite storage possibilities. SmartShelf provides full depth and back-to-back configurations or any combination of both within the same unit, including all available options and accessories.

Individual fully loaded shelves, however, cannot be moved as easily as those used with cantilever-type (library) shelving because of the nature of the shelf assembly (see Figure 31).

Accessories include specialty shelves, drawers, trays, bins, hooks, and rolled adapters. This shelving system can house CDs, DVDs, videos, archival boxes, bones, street signs, tires, garments, pills, trophies, jewelry, golf bags, shoes, files, skis, bicycles, microwaves—anything you can imagine.

SmartShelf can be used for either fixed or mobile applications (for dimensions, see Figure 32).



Figure 29. Montel Aetnastak® Cantilever Library Shelving with Multimedia Accessories

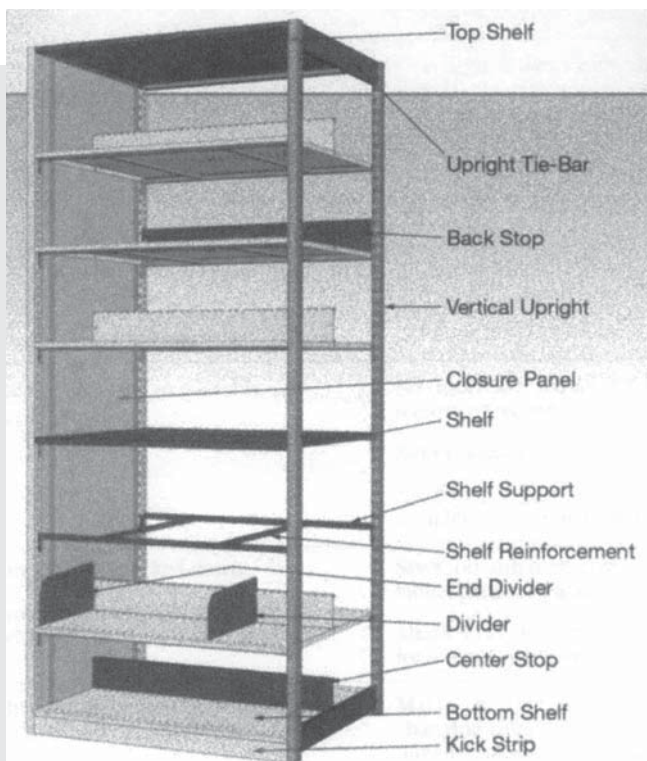


Figure 30. Montel SmartShelf®

Other shelving features include:

- Shelves are adjustable at 1" (hooks technology) and 1 1/2" increments (snap-in supported technology) on the same shelving system.
- 39 3/8" wide sections are available to accommodate three archival boxes without wasted space.
- Full-depth shelving uses only two posts instead of four with one supported shelf instead of two shelves back-to-back, reducing the cost significantly.
- No cross bracing required.
- Systems are easy to assemble.
 - o No tools are required to assemble, remove, or reconfigure.
 - o Reduces installation cost/time significantly.
 - o No rivets, nuts, screws, or bolts make assembly easy. Shelves offer a clean look.

- Uprights
 - o Constructed with two upright tie-bars (or more) joined to the top and bottom of the vertical uprights to form a rectangular upright frame
 - o Adaptable for seismic zones and meets seismic requirements
 - o 1" increments on one side to use with hooks and back-to-back shelves
 - o 1 1/2" increments on the other side to use with supported 22-gauge shelves
 - o Vertical uprights are made of 16-gauge steel forming a 1 1/4"x1 1/2" rectangular, fully enclosed tube.
- Adds strength
- Prevents books, files, or any object from being torn and safely conceals wiring for canopy lights.
- Shelves
 - o Double-faced (full depth) shelves with center stops installed and removed without adjusting or removing any shelves above or below (slide-in and slide-out).
 - o 3/4" thick shelves are made of 22-gauge or heavy-duty 18-gauge steel.
 - o Shelves are slotted at 1" increments to accommodate dividers.
 - o Shelf reinforcement
 - Reinforcements are slotted to fit into shelf supports.

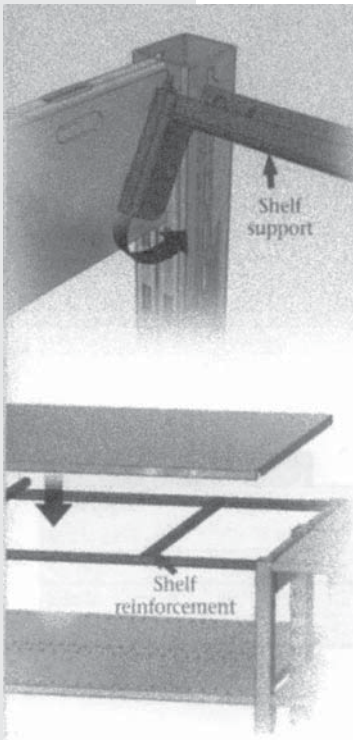


Figure 31. Montel SmartShelf Support and Reinforcement

- Reinforcements are added as needed to accommodate heavier materials or wider sections.
- o 12-gauge steel shelf supports add strength:
 - Either 3/4" high or 1 1/4" high, depending on the application
 - Hold the shelves safely and allows the addition of reinforcement channels

Shelf depth:									
Back to back, in.:	8	9	10	12	13	15	16	18	24
Full depth, in.:	16	18	20	24	26	30	32	36	
Width, in.:	30	36	39 3/8	42	48				
Height, in.:	76	85	88	97					

Figure 32. Montel SmartShelf Dimensions

Optional accessories include:

Levelers on fixed sections	Sway brace
Hinged shelf for periodicals	Shelf back
Pullout reference shelf	Canopy top
Keyboard shelf	Back panel
Card holder	Lockable door
Pullout or fixed browsing box	Golf bag adapter
For CDs, DVDs, tapes	Hooks
1 1/2" kickstrip	Rolled textile adaptor

Smith System

The Smith shelving system provides three media options:

- Media tray and sloped shelf
 - o 45° sloped shelf with removable media storage tray
 - o Tray has six adjustable dividers to separate media into rows.
 - o Tray accommodates audiotapes, videotapes, and so on.
- Media browser shelf
 - o Tub (11" deep by 5" high) is sloped front and rear to accommodate browsing CDs, videotapes, and paperbacks. Holds all security case sizes.
 - o Shelf has five adjustable dividers to separate media into rows.
- Media bag shelf
 - o Designed with 36 knockouts to hold hook-on bags for multimedia.
 - o Adjusts to hold bags of all heights and up to 35" wide by 12" deep.

Penco

Many years ago Charles Palm, the archivist at the Hoover Institution at Stanford University, turned to industrial shelving, as opposed to standard library shelving,

to solve the problems of housing archival materials. He selected this type of shelving for the space efficiencies that could be achieved.

For example, archives use two standard size manuscript boxes, one 5" wide and the other 12"x12"x12". Palm found he could house eight 5" boxes or three manuscript boxes on a 43" wide by 15" deep shelf that also provided finger space to pull the boxes off the shelf. He selected Penco because, unlike most industrial shelving, its posts were beaded, thus eliminating all sharp edges and the possibility of damage to materials housed on it.

The Hoover archivist also specified a special-order Penco shelf, measuring 48"x72", for map and poster storage. He found by putting these items in acid-free boxes and storing them on this special-size shelving he could achieve greater efficiency than by using the standard map file drawers. These shelving sections were 72 1/2" high.

This story illustrates that thinking creatively about the problems posed by the materials to be housed and with an open mind about the types of equipment that might be used to house them can lead to extremely successful solutions.

For multimedia, industrial-type shelving offers interesting alternatives.

Equipto

Equipto, a manufacturer of industrial shelving for the materials-handling industry since 1907, has developed and designed new products that reach beyond industry to meet the needs of the office and the library. The company has developed a system called Equiptovation® with V-Grip® construction feature that the company describes as providing unlimited versatility in making efficient use of space, floor to ceiling, with simple tools (see Figure 33).

V-Grip shelving features an efficient fastening principle that supports instant shelf adjustment on 1 1/2" centers, without disturbing shelves in adjoining units. V-Grip is a completely interchangeable system users can manipulate to meet multiple needs. The following is a scenario posed by the company:

"Put some wire shelving on top, to filter light and air, and some solid shelving on the bottom, for extra strength. Throw a bin under there, and a cabinet over here and put a locking door in the middle. You have the ability to create the system you want..."

- V-Grip® uprights permit back-to-back assembly of shelving units and easy adjustment.
- Heavy-duty V-Grip® shelves are constructed of 18-gauge steel and double-flanged on all four sides for maximum strength and rigidity.
- Shelves have smooth, box-formed edges.
- End and front reinforcing channels can be added to shelves to accommodate extra stress.
- The system can combine solid and wire shelving, dividers, plastic Century Containers, and a wide-span rack.
- Reflective white back and end panels reflect light, creating a bright environment. This color is a standard detail regardless of the shelf color selected. The



Figure 33. Equipto V-Grip® Shelving

system is available in four standard colors, five special colors, and premium colors that include all other colors. Special and premium colors are available with varying additional paint charges.

- V-Grip is available in both closed and open shelving styles.
- Height of all units is 84" (see Figure 34 for dimensions and loading capacity).

V-Grip wire shelving is available in the following heights:

- 36" with two shelves
- 48" with three shelves
- 60" with four shelves
- 72" with five shelves
- 84" with six shelves
- 96" with seven shelves
- 120" with nine shelves

Each wire shelf has a 700-pound capacity.

V-Grip Slim Line Shelving has a narrow flange appropriate for open shelf filing. Its features include:

- Pullout reference shelves
- Adjustable shelf dividers
- Solid shelf, slotted shelf, slotted back stop
- Center stop
- Solid back stop
- Available in heights 78" and 90"
- Available in widths 36", 42", and 48"
- Available in depths 12", 15", 24", and 30"
- Available in freestanding or mobile models

Equipto offers both V-Grip units with bins. Standard units are 36" wide by 84" high, but available in other custom sizes. These units are available in depths of 12", 18", and 24". A unit may have from 21 openings to 78 openings, depending on the size(s) required. These units also may be equipped with assorted drawer sizes.

Iron Grip® is the strongest and most versatile of the company's storage systems. Shelf placement can be done quickly without tools; a simple, solid steel stud is located at every shelf corner. This independent unit concept is engineered for strength and is infinitely adjustable for custom fitting to specific needs.

By adding 13-gauge, U-formed channels (3/8"x1 3/32") extra strength reinforcement is provided for heavily loaded shelves. End and center channels are added for the heaviest use. The basic Iron Grip bin unit is 7' high by 3' wide, with 4' width optionally available. Iron Grip is available in 12", 18", 24", and 36" depths. Iron Grip units allow for quick changes in bin sizes.

Doors can be added for cleanliness and security. Doors attach easily to uprights of both Equipto's V-Grip and Iron Grip shelving, bin, and drawer units.

Depth, in.	Width, in.	Capacity per shelf, lbs.
12	36	650
12	36	940
12	42	500
12	42	900
12	48	430
12	48	700
18	36	700
18	36	1,170
18	42	500
18	42	900
18	48	440
18	48	740
24	36	721
24	36	1,000
24	42	500
24	42	900
24	48	450
24	48	720
36	36	690
36	36	790

Figure 34. Equipto V-Grip Shelving Dimensions and Loading Capacity

Dasco Data Products (DDP)

Dasco Data Products has been designing, engineering, and producing products in the media and systems storage market since 1963. All DDP manufactured products have a 10-year warranty.

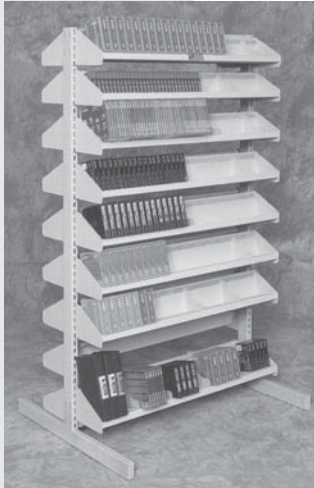


Figure 35. DDP Multimedia Rack

Media	Capacity per multimedia shelf	Space required, in.
CLT/SDLT (in case)	25	6
LTO (in case)	38	6
CD/DVD (jewel case)	78	7
4mm	52	5
8mm	40	5
3570 Magstar	51	5
VHS (sleeve or case)	30	9
Optical 5.25"	45	7
3480/3490	32	6

Figure 36. DDP Multimedia Rack Storage Capacity

DDP's Multimedia Racks are available in two heights, 54" and 84". Width is 32 1/2". Racks are single or double-sided (see Figures 35 and 36). Each shelf is adjustable in 1" increments and have two adjustable dividers. When adding on to the left or right, a common post is used.

Dataware

Dataware manufactures only one style multimedia rack and a multimedia cart. All racks are of putty-colored welded steel construction and ship unassembled. A 7/16" socket wrench is required for assembly (see Figure 37 more details).

	Dimensions			Capacities									
	Width, in.	Depth, in.	Height, in.	4mm	8mm	DLT	CD	Tape	QIC	3480	20-pk	LTO	3570
Rack													
Single-sided													
5331	37.3	12	78.1	672	504	336	720	216	360	420	18	392	672
5341	48.3	12	78.1	896	672	448	960	288	480	560	24	-	-
5351	60.3	12	78.1	1,120	840	560	1,200	360	600	700	30	-	-
Double-sided													
5332	37.3	12	78.1	1,344	1,008	672	1,440	432	720	840	36	784	1,008
5342	48.8	12	78.1	1,792	1,244	896	1,920	576	960	1,120	48	-	-
5352	60.3	12	78.1	1,240	1,680	1,120	2,400	720	1,200	1,400	60	-	-
Shelves per side				14	14	14	10	6	10	14	6	14	14
Cart													
5310	39.4	15	46.5	672	504	336	720	216	360	420	18	392	672
Shelves per side				7	7	7	5	3	5	7	3	7	7
Maximum per shelf													
36"				48	36	24	72	36	36	30	3	28	48
48"				64	48	32	96	48	48	40	4	-	-
60"				80	60	40	120	60	60	50	5	-	-
Shelf type*				A	C	A	AM	B	C	D	B	LTO36	MP36
Vertical slots used**				3	3	3	4	7	4	3	7	3	3

*For shelf style number, combine the shelf type letter with the shelf length number; for example: for a 48" shelf for 2480s, order D48.

**Racks have 42 vertical slots; carts have 21 vertical slots.

Figure 37. Dataware Racks, Cart, and Shelves Multimedia Storage Capacities

Carousels or spinners

Texwood

Texwood's American Series offers three carousel styles designed to hold videos as well as paperback books: oak frame, oak or melamine base, and metal frame and base (see Figures 38, 39, and 40).

The oak frame with revolving towers measures 62" high by 23" wide by 23" deep and includes four towers. Five-tier towers provide space for videos up to 8 7/8" high with a capacity of 60 videos per tower, or 240 videos per carousel. This system is designed to expand in a zigzag pattern with starters and add-ons. Starters consist of two frames and one tower and add-ons of one frame and one tower.

The Junior Oak Frame Display designed for children measures 52" high by 23" wide by 23" deep and contains four high-impact polystyrene towers. Each tower holds 60 videos with a total capacity of 240 videos. Like the adult version, this system can be expanded in a zigzag pattern.

The single oak or melamine base style with one revolving tower measures 72" high by 15 1/2" wide; the double with two revolving towers and the quad with four revolving towers both measure 72" high by 35" wide. Each tower holds 72 videos.

The Junior version of the single carousel measures 57" high by 15 1/2" wide and the double measures 57" high by 35" wide. Each tower holds 60 videos.

The metal frame and base style measures 63" high by 34" diameter. It contains four high-impact polystyrene revolving towers. The five-tier tower for videos holds 240 videos.

Gressco Ltd.

For media displays, Gressco's Mar-Line® display systems provide options to create a media display system best suited for a specific collection and its use and the possibility for its expansion.



Figure 38. Texwood Revolving Tower Displays

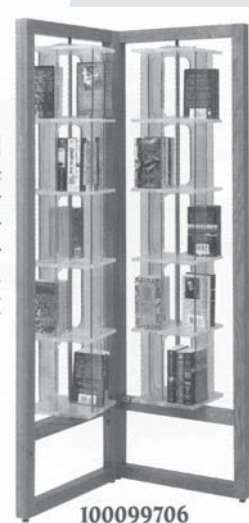


Figure 39. Texwood Revolving Tower Oak Frame Display

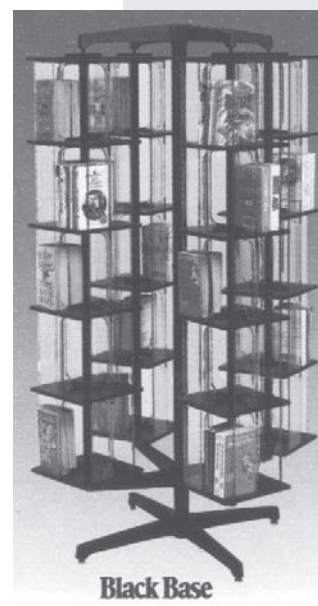


Figure 40. Texwood Metal Base Revolving Display

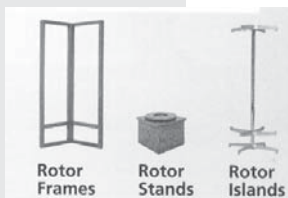


Figure 41. Gressco Ltd. Mar-Line® Display Frame Style Options



Figure 42. Gressco Ltd. Mar-Line Vista Circular Tower Display

The company has developed a three-step display selection process for this purpose.

1. Select the frame style and color from three options: rotor frames, rotor stands, and rotor islands (see Figure 41).
2. Tower options—Determine the number of paperback books, videos, DVDs, CDs, and audiocassettes to be displayed.
 - a. The five-tier option holds large paperback books, DVDs, and videos.
 - b. The six-tier option holds regular paperback books.
 - c. The eight-tier option holds CDs and audiocassettes.
3. Calculate the number of towers needed by dividing the collection by the tower capacity.
 - a. Five-tier: 125 paperback books with spines up to 8 7/8" high or 60 videos with spines up to 8 7/8" high or 140 DVDs
 - b. Six-tier: 150 paperback books with spines up to 7 3/8" high
 - c. Eight-tier: 440 CDs 5" high or 256 audiocassettes 4 3/8" high

This company has nearly a dozen different frame designs, a few similar to those available from Texwood. They are available in wood, metal, and Melamine laminate. Figure 42 is the Gressco's solid-wood Vista Circular Tower Display design.

Gressco also manufactures rotor system displays designed for children. Its catalog includes each style's capacity for each medium it holds, as well as each unit's dimensions, making it easy to determine the design best suited for the collection.

Kardex Systems, Inc.

Kardex Systems, Inc., founded in 1978, manufactures Lektrievers®, which are vertical carousels (see Figure 43). In this system, multimedia are stored on movable carriers that rotate Ferris-wheel style on electronic command, delivering the needed media to a work counter that adjusts to an ergonomically correct standing (40 1/2" high) or seated position (29 1/2" high).

This unit makes storing large collections in a small footprint possible: the higher the unit, the greater the density within the same footprint, which makes maximum use of the space between floor and ceiling.

Lektrievers range in size from 7'11 1/2" high by 3'11" wide by 4'11 3/4" deep, including the work counter, to 11'9" high by 10'10" wide by 4'11 3/4" deep. The shortest unit Kardex will make is 7'7" high. The Industrier® has a maximum height of 19'6".

The shortest standard unit, 7'11 1/2" high, contains 14 carriers when the distance between carriers is 11" and 10 carriers when the distance is 13". The manufacturer calls this distance *pitch*.

If the absolute shortest unit—7'7" high unit (ordered as custom)—is used, you lose two carriers—from 14 to 12—on the 11" pitch unit and three carriers—from 10 to seven—on the 13" pitch units. The tallest standard office unit 11'9" high contains 22 carriers when the pitch is 11" and 18 carriers when the pitch is 13".

Each carrier may contain one, two, or three shelves, depending on the media to be stored, the smaller the media the more tiers that can be effectively used. The manufacturer calls the shelves *tiers*.

The work counter or posting board is 15" deep. It extends in front of the unit 11 1/2".

The Lektriever has a keyboard console. Each unit is equipped with controls that let the user start and stop the rotation of the carriers from the keyboard console or from a personal computer when interfaced with software. Lektriever IMMS automated filing systems allow the delivery of needed media to the user on electronic command.

Lektrievers have been successfully used in libraries for storing large microfiche collections. The largest units have been used in military libraries with large collections of government microfiche.

To provide direct public access, including access for the disabled, to engineering-related government publications on microfiche, the Engineering Library at the University of California at Berkeley used the Kardveyer®. The Kardveyer was only 3'10" high, making it possible to locate this equipment in the middle of public space without impeding views throughout the area. With less use of microfiche and other formats used in banks, Kardex is, unfortunately, no longer manufacturing this shorter model.

The carriers are designed to mix and match multimedia for storage and retrieval. Compartments of any width may be installed on the tiers by welding dividers in place. Trays with various sized inserts also are available. Kardex will provide tier accessories and configurations to meet the storage requirements for all types of media.

Figure 44 illustrates capacities for a few formats stored in various sized Lektrievers.

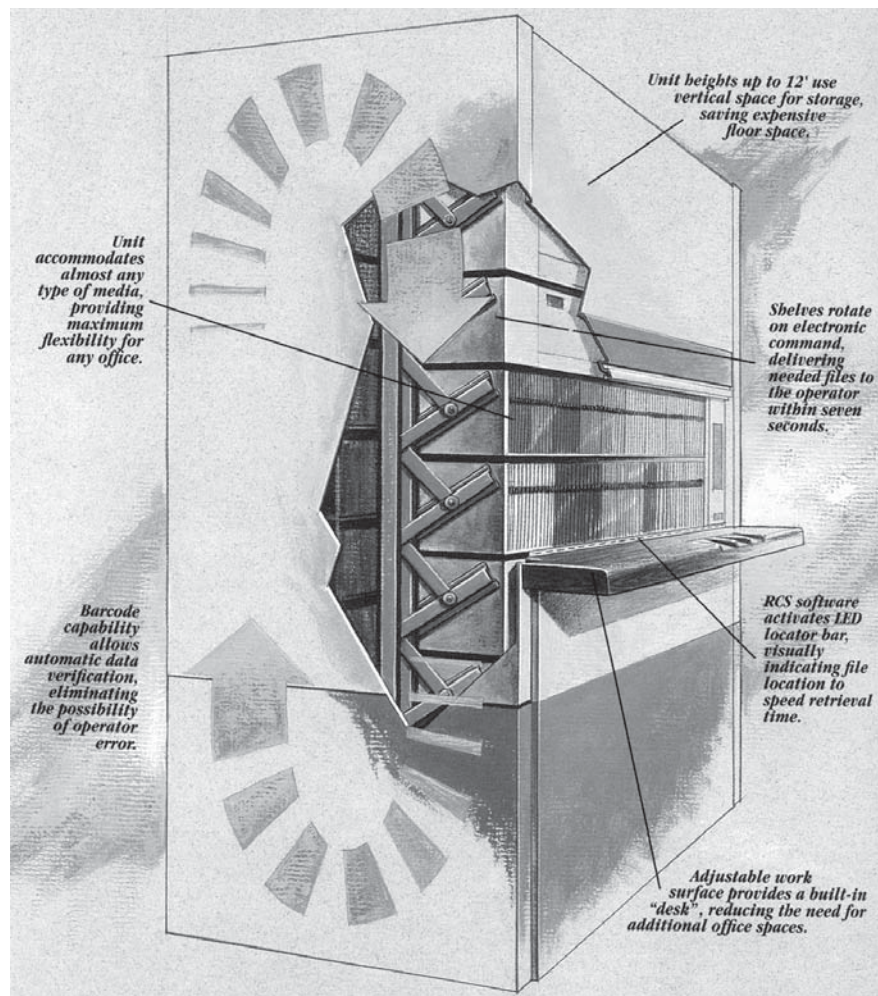


Figure 43. Kardex Lektriever®

11" pitch unit				Unit capacity				
Media size	Unit width in.	Mode of filing	Carrier capacity, LFI	14 carrier 8' high, LFI	16 carrier 9' high, LFI	18 carrier 10' high, LFI	20 carrier 11' high, LFI	22 carrier 12' high, LFI
Letter (8.5" x 11") or	77	Lateral	62.5	875	1,000	1,125	1,250	1,375
	102	Lateral	88.1	1,234	1,410	1,586	1,763	1,938
Legal (8.5" x 14")	116	Lateral	101.5	1,421	1,624	1,827	2,030	2,233
	130	Lateral	116.8	1,635	1,869	2,102	2,336	2,570
Letter (8.5" x 11")	77	Tray	71.5	1,001	1,144	1,287	1,429	1,573
	102	Tray	100.0	1,400	1,600	1,800	2,000	2,200
	116	Tray	114.3	1,600	1,829	2,057	2,286	2,515
	130	Tray	128.6	1,800	2,058	2,315	2,573	2,829
Legal (8.5" x 14")	77	Tray	57.2	801	915	1,030	1,143	1,258
	102	Tray	71.5	1,001	1,144	1,287	1,430	1,573
	116	Tray	85.8	1,201	1,373	1,544	1,714	1,888
	130	Tray	100.0	1,400	1,600	1,800	2,001	2,200
Hanging letter (8.5" x 11")	77	Tray	57.2	801	915	1,030	1,143	1,258
	102	Tray	85.8	1,201	1,373	1,544	1,715	1,888
Hanging legal (8.5"x14")	77	Tray	42.9	601	686	772	858	944
	102	Tray	71.5	1,001	1,144	1,287	1,426	1,573
8 23/32"x3 1/2" check tray (double-tiered carrier)	77	Tray	174.5	2,443	2,792	3,141	3,489	3,839
	102	Tray	261.7	3,661	4,187	4,711	5,234	5,757
8"x8", 8"x9" fingerprint tray	77	Tray	101.8	1,425	1,629	1,832	2,035	2,240
	102	Tray	145.4	2,036	2,326	2,617	2,908	3,199
7 3/8"x3 1/4" tab/video tray (double-tiered carrier)	77	Tray	232.6	3,256	3,722	4,187	4,652	5,117
	102	Tray	319.1	4,479	5,118	5,758	6,397	7,038
6"x4" (double-tiered carrier)	77	Tray	290.8	4,071	4,653	5,234	5,816	6,398
	102	Tray	407.1	5,699	6,514	7,328	8,142	8,956
5"x3" (double-tiered carrier)	77	Tray	319.9	4,479	5,118	5,758	6,397	7,038
	102	Tray	465.2	6,513	7,443	8,374	9,305	10,234
4"x4"x1" microfilm roll (double-tiered carrier)	77	Double-sided tray	392 rolls	5,488 rolls	6,272 rolls	7,056 rolls	7,840 rolls	8,624 rolls
	102	Double-sided tray	560 rolls	7,840 rolls	8,960 rolls	10,080 rolls	11,200 rolls	12,320 rolls

Figure 44. Kardex Lektriever® Multimedia Storage Capacities (LFI = linear filing inches)

The weight of this equipment combined with the weight of media can be substantial. The building floor load capacity must be checked, ideally with the help of a structural engineer, to be certain the weight of the equipment and media will be compatible with the proposed location. For example, a 10' high Lektriever 130 with 18 letter lateral carriers weighs 8,198 pounds fully loaded. The equipment weighs 3,321 pounds, and the letter files weigh 4,877 pounds. The unit's footprint measures 144 square feet.

Lektrievers meet the requirements set forth in the Americans with Disabilities Act and in conjunction with OSHA's workplace ergonomic standards.

Side-to-side combination sliding shelving/drawers

Russ Bassett Co.

Russ Bassett Co., founded in 1960, provides high-density media storage solutions for libraries. One of its many products is called Gemtrac® (see Figure 45). The company describes this system as a filing cabinet with vertical drawers or shelves that slide into a cabinet. The company claims collections of film, tape, and disks stored in Gemtrac can save up to 70% of the square footage required if the collections were stored on standard open shelving.

The basic cabinet is designed as an open frame into which drawers, rails, and hardware are installed. The drawers are suspended from heavy-duty overhead rails, eliminating the need for floor tracks.

The enclosed cabinet design provides greater dust protection compared with open shelving. Gang locks for these cabinets are available as an option if security is a requirement. Drawers are made standard with label holders for identification.

This equipment is manufactured with an archive-safe powder coat finish, as specified by the U.S. National Archives. All cabinets are warranted to be free from defects in workmanship and material for 10 years.

Individual slots may be created in the drawers by vertical aluminum dividers. The spacing is precisely calculated for specific media formats. Adjustable shelving design is used in the construction of the drawers making mixing various formats within the same space possible.

If the unit is a stand-alone unit, it is enclosed with side and back panels. If the unit is one of many in a multiple cabinet installation, side and back panels are only included on units located at the ends that are exposed. The benefits of this design are reduced shipping weight, reduced floor loading, and a lower cost on multiple unit installations.

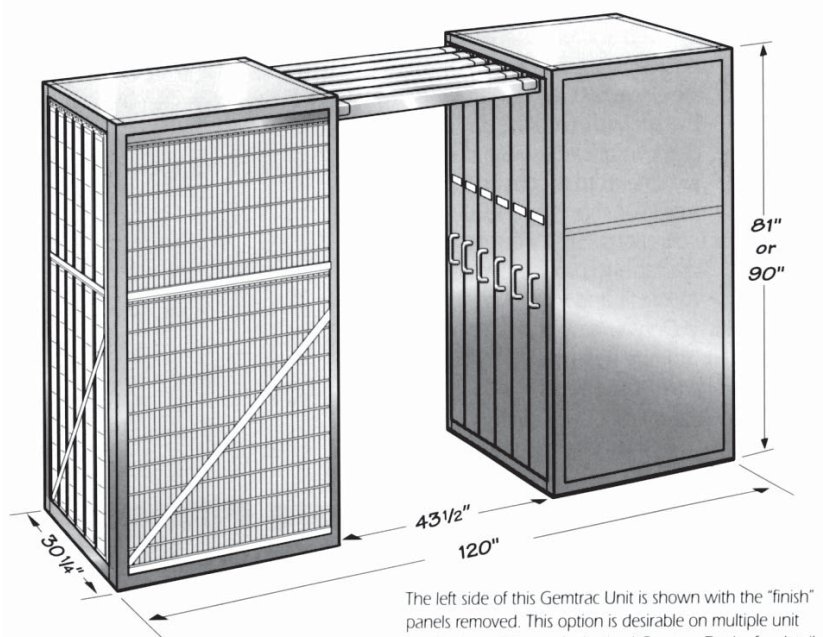


Figure 45. Russ Bassett Gemtrac®

Figure 46 lists media capacities in Gemtrac welded shelf models with individual slots.

Small formats								
Model	Description	Capacity				Dimensions		
		4mm	8mm	Audio	CD	Height, in.	Width, in.	Depth, in.
G4M-81	81", 4mm	9,984				80 7/8	30	120
G4M-90	90", 4mm	11,232				90	30	120
G8M-81	81", 8mm		6,240	6,240		80 7/8	30	120
G8M-90	90", 8mm		7,200	7,200		90	30	120
GCD-81	81", CD				7,680	80 7/8	30	120
GCD-90	90", CD				8,960	90	30	120
Medium formats								
Model	Description	Capacity				Dimensions		
		VHS (case)	Beta (small)			Height, in.	Width, in.	Depth, in.
GV81	81", VHS (case)	2,140				80 7/8	30	120
GV-90	90", VHS (case)	2,430				90	30	120
GB81	81", Beta (small)		2,340			80 7/8	30	120
GB-90	90", Beta (small)		2,600			90	30	120

Figure 46. Russ Bassett Slotted-shelf Gemtrac® Multimedia Storage Capacity

Figure 47 lists media capacities in Gemtrac models with adjustable shelves.

Medium formats								
Model	Description	Capacity				Dimensions		
		VHS (sleeve)	Beta (small)	VHS (case)	D2 (small)	Height, in.	Width, in.	Depth, in.
GAV-B-81	81", Adj. shelves	2,880	2,916			80 7/8	32 1/2	120
GAV-B-90	90", Adj. shelves	3,240	3,240			90	32 1/2	120
GAV-C-81	81", Adj. shelves			2,240		80 7/8	30	120
GAV-C-90	90", Adj. shelves			2,520		90	30	120
GAV-D-81	81", Adj. shelves				1,680	80 7/8	32 1/2	120
GAV-D-90	90", Adj. shelves				1,890	90	32 1/2	120
Large formats								
Model	Description	Capacity				Dimensions		
		Beta (large)	3/4 U-Matic (case)	D2 (large)		Height, in.	Width, in.	Depth, in.
GAV-F-81	81", Adj. shelves	1,040	1,056	840		80 7/8	32 1/2	120
GAV-F-90	90", Adj. shelves	1,248	1,232	1,008		90	32 1/2	120

Figure 47. Russ Bassett Adjustable Shelf Gemtrac® Multimedia Storage Capacity

Gemtrac with aluminum dividers is available only for 16mm collections. They provide individual slots for each item. Rolls are filed vertically.

Gemtrac with plastic compressors accommodate both 16mm and 35mm roll film. Cartons or cartridges are filed vertically on open shelves. Each item is held in place by the overhead plastic compressor, has its own reserved space, and can be quickly retrieved and returned with total filing integrity ensured.

Both shelf styles also ensure that media will not tip over even when the drawer is firmly opened or closed.

Figure 48 lists media capacity in Gemtrac high-density filing for 16mm and 35mm roll film.

Model	Description	# of drawers	Capacity per cabinet		Height, in.	Dimensions	
			16 mm	35 mm		Width, in.	Depth, in.
GR-81-D	81" unit with dividers	12	5,940		80 7/8	30 1/4	120
GR-90-D	90" unit with dividers	12	6,732		90	30 1/4	120
GR-81-PC	81" unit with compressor	12	6,300	3,780	80 7/8	30 1/4	120
GR-90-PC	90" unit with compressor	12	7,140	4,284	90	30 1/4	120

Figure 48. Russ Bassett 16mm & 35mm Roll Film Gemtrac® Storage Capacity

Compact system with movable aisles for cabinets, shelving, and racks

An increasing number of manufacturers produce compact (high-density) storage systems with movable aisles. In addition to the standard compact systems for book collections—Spacesaver, Montel, White, and Elecompact—there are those designed for the office and for industrial use that are becoming increasingly useful in the library environment: Aurora by Richards-Wilcox, Kompakt by Kardex, Tab, Mayline, and Equipto.

All these systems—whether designed primarily for libraries, offices, or industry—can house multimedia by accommodating all types of equipment on its carriages: cabinets, shelving, and racks. These compact systems make possible the use of many types of standard multimedia storage equipment, but with fewer aisles, thus saving a substantial amount of floor space.

Operation of compact systems may be by manual, mechanical-assist, or electrical drives.

Montel, Inc.

Montel, Inc. manufactures two movable aisle systems: Mobilex® for large applications and Quadramobile® for offices and small applications.

The Mobilex system can accommodate its four-post shelving (QuadraVista®), cantilever shelving (Aetnastak®), wide-span shelving, and any other type of shelving and cabinets. Montel will custom design a system to fit any client's needs. The following is a partial list of features of this system:

- Mechanical and electrical systems available
- Full-length drive shaft on every carriage
 - Eliminates possible distortion
 - Reduces potential stress on carriage structure
- All wheels are 5" diameter, double-flanged steel.
 - Reduce friction

- o Double-guide rims and radiused surface provide minimum friction and perfect alignment.
- o Better guidance
- o Made of high-grade steel with static load capacity of 3,220 pounds
- Effort required to initiate movement
 - o A double-gear reduction system drives the wheels.
 - o The ratio varies according to the loads.
- Two-piece rail
 - o Better weight distribution at the junction point
 - o Facilitates concrete pouring if required
 - o 3/8" opening on each side of tracks reduces tripping hazard and steps for book trucks.
- Safety features: Abundant for both mechanical and electrical systems
- Options
 - o Approved anti-tip devices for earthquake-prone areas
 - o Access ramp made of 12-gauge steel 8" wide standard or 21" for ADA compliance
 - o Drive mechanism at each end of ranges for dual access

Quadramobile can be used as a high-density storage system for videos, CDs, DVDs, and other formats. For example, the shelves in its QuadraVista welded frame shelving system can accommodate nine levels of videotape storage or 558 videos within one cabinet, 31 videos per shelf.

Quadromobile is designed to expand in all four directions to meet growing collection needs (see Figure 49 for dimensions). The modular floor concept allows for future expansion and easy relocation. The freed space is undamaged and ready for reuse.

Montel uses its QuadraVista four-post shelving with this system, but traditional lateral filing cabinets also can be installed on its carriages. These cabinets in their traditional arrangement occupy 2.67 times more floor space than they do when used on this system.

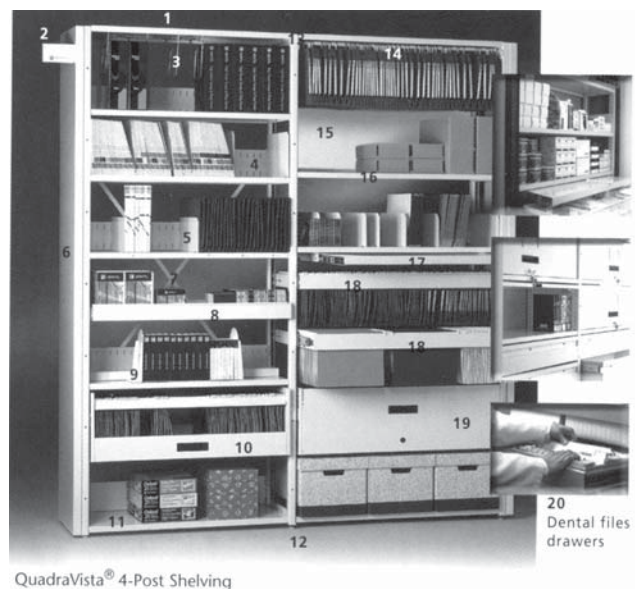
The following is a partial list of additional features:

- Available in manual, mechanical, and electrical systems
- Modular floor
 - o Height of modular floor 1 1/2" above existing floor
 - o Steel rails inserted in aluminum extrusion
 - o Anti-tip channel is incorporated in the aluminum subrail.
 - o Does not damage existing floor
 - o System can be easily assembled and relocated.
 - o Modular floor concept allows for future expansion.
- Carriage

- o Wheel housing member is constructed of 12-gauge steel.
- o Base shelf is made of 16-gauge steel, 2 3/4" high, slotted to receive dividers, and forms an integral part of the carriage assembly.
- o Four-post shelving fastened to carriage with bolts
- o Capacity is 750 pounds per linear foot of carriage.
- Wheels
 - o Steel 3" diameter by 3/4" wide
 - o Assembled on 5/8" diameter steel axle, supported by two ball bearings secured to housing member

Height, in.			
Total height	65	83	90
Upright	60	78	85
Width, in.			
Shelves	36	42	48
Storage width	34 3/4	40 3/4	46 3/4
Starter cabinet	40	46	52
Adder cabinet	36	42	48
Depth, in.			
Shelves		12	15
Single range		13 7/8	16 7/8
Double range		26 3/8	32 3/8

Figure 49. Montel QuadraMobile® Dimensions



- QuadraVista® 4-Post Shelving
- | | |
|---|---|
| 1. Canopy top | 11. Welded shelf back |
| 2. Double-face range finder | 12. Adjustable leveler glide |
| 3. Wire book supports | 13. Upright frame |
| 4. Slotted shelf and back | 14. Suspension bars for "oblique" folders |
| 5. Dividers | 15. Back Panel |
| 6. End panel | 16. Full size shelf back |
| 7. Sway braces | 17. Sliding reference shelf |
| 8. Pull-out drawer with magnetic dividers for CD-ROM, video tapes, stationary, etc. | 18. Sliding frame for hanging files |
| 9. Book support | 19. Pull-out slotted drawer (closed) |
| 10. Pull-out slotted drawer (half closed) | 20. Dental files drawers |

Figure 50. Montel QuadraVista® Multimedia Accessories

Equipto

Equipto's Mobile Aisle is designed to accommodate its shelving, racks, drawers, and cabinets either separately or by combining all of them in a single system.

Characteristics of this system include:

- Modular design facilitates installation.
- One-hand operation moves an entire aisle (available in either manual or mechanically assisted drives).
- It can be leveled on uneven surfaces.
- Safety lock prevents closing of aisle until lock is disengaged.
- The modular design allows reconfiguring the system in minutes.
- Capacities begin at 1,000 pounds per linear foot of carriage.
- Mobile Aisle system can be installed on any type of floor or carpet and can be relocated easily and inexpensively.

- Mobile system can be locked for security of contents.
- Optional Tip-Stop® reduces chance of a carriage falling over.
- Optional ramp meets ADA requirements.

Equipto manufactures the entire system from carriage to shelving, racks, drawers, and cabinets for a totally integrated system.

Mayline Group

Mayline Group manufactures two systems: Mobile Aisle 820 mechanical assist system and Mobile Aisle 810 manual system. Features of these systems include:

- Accommodates Mayline's four-post shelving and that of other manufacturers, including Tennsco and Aurora (systems are only to be used for shelving).
- Effort to move the system
 - o Mechanical assist—1 pound of effort to move 10,000 pounds of shelving and media
 - o Manual—4 pounds of effort to move 8,000 pounds of shelving and media
- Mechanical assist can move multiple ranges and ranges up to 30' in range length.
- Manual is best used for systems with ranges not exceeding 8' in range length.
- Locking options available for both manual and mechanical assist systems

Rotary storage system (high-density storage)

KI (*Spacesaver*)

KI has developed PivotFile® Rotary Storage that it describes as double-banked for faster access and more capacity, breaking with the traditional lateral and vertical file systems (see Figure 51). Rotary Storage delivers up to 400% more information in the same floor space as traditional drawer files.

KI claims the high storage capacity is achieved with lighter floor loads than high-density mobile storage. It also claims that by installing back-to-back PivotFile units for high access materials, high-density storage can be achieved without the inconvenience of the inaccessible aisles in mobile storage systems.

PivotFile provides a multimedia storage environment (see Figure 52). Many accessories support interchangeability and the open architecture of the system will support future storage requirements.

The first unit in any row of PivotFile is always a *starter*. A small collection may only require a single starter unit. As it grows, additional units can be added easily.

The depth dimension of the equipment does not include the rotation space clearance required behind any rotary storage unit when placed against a wall.

For letter-size purposes the rotation space is slightly less than 6"; for legal-size the space is slightly more than 7".

Dual access is standard; dual pedals are included with every unit providing access to both sides of the equipment, or to what would otherwise be thought of as the front and the back. Provide single side access by specifying Secure Backs.

The system is available in 12 heights. For counterheight units, custom tops of stone, wood, plastic laminate, or other types of artificial surfaces may be specified.

Flexibility for storing different types of media is achieved by the wide variety of accessories available to configure the interior of the PivotFile. The louvers on which all accessories hang are spaced at 1 3/4" increments. The

chart below identifies various media applications and louvers required.

To determine the interior configuration, simply subtract the louver requirement for each accessory, or number of a single-type accessory required, from the total number of louvers per unit, as shown in Figure 53.

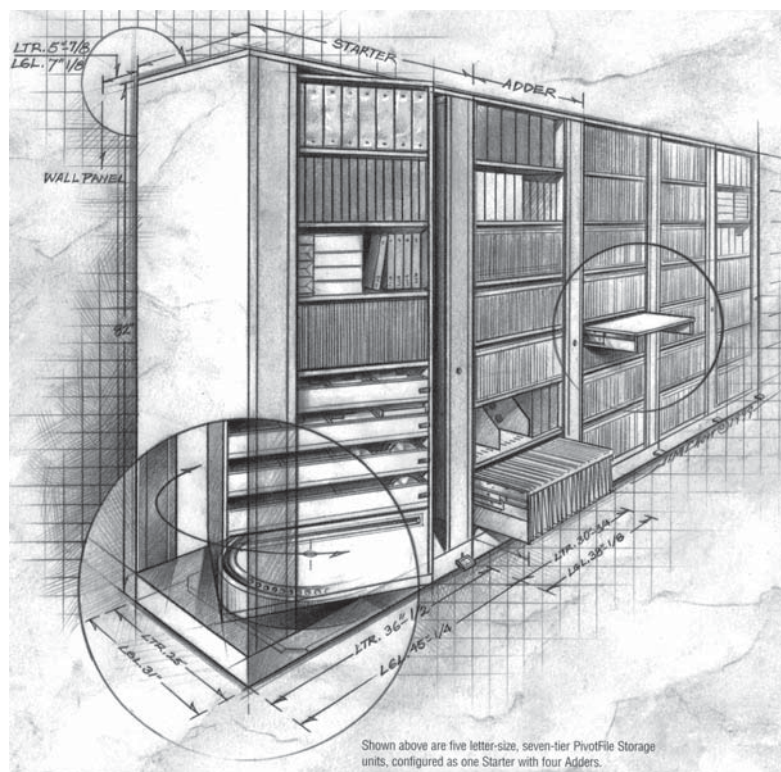


Figure 51. KI (Spacesaver) PivotFile®

Size, in.	Opening	Application	Louvers required
1 1/4	Clear	Extra shelf storage	1
3	Clear	Flat forms	2
4 3/4	Clear	Microfilm fiche, checks	3
6 1/2	Clear	CD-ROM storage	4
8 1/4	Clear	Specialty height documents	5
10	Clear	Top-tab, end-tab, hanging folders, security drawers	6
11 3/4	Clear	Three-ring binders, oblique rails	7
13 1/2	Clear	EDP printouts	8
15 1/4	Clear	Ledgers	9
17	Clear	Box storage	10
18 3/4	Clear	X-rays (stored on end)	11

Figure 52. KI (Spacesaver) PivotFile® Dimensions for Multimedia

Unit height	Louvers	Unit height	Louvers
3-tier	20	6-tier Plus	40
4-tier	25	7-tier	43
4-tier Plus	28	7-tier Plus	47
5-tier	31	8-tier	49
5-tier Plus	34	8-tier Plus	52
6 tier	37	9-tier	55

Figure 53. KI PivotFile®: How To Determine Interior Configuration

Unit heights are:

- Three-tier 41 5/8"
- Four-tier 50 3/8"
- Four-tier plus 55 5/8"
- Five-tier 60 7/8"
- Five-tier plus 66 1/8"
- Six-tier 71 3/8"
- Six-tier plus 76 5/8"
- Seven-tier 82"
- Seven-tier plus 89"
- Eight-tier 92 1/2"
- Eight-tier plus 97 3/4"
- Nine-tier 103"

To operate the PivotFile, first determine who will use it. Will it house a high-use collection directly accessible to the public? Will it house an archival collection that must be placed in a public location? Will it house a collection only accessible by staff? These are just a few questions to answer to determine how it should be set up to operate.

All the following options are available on all units.

- Adjust so that foot pedal remains down and the rotor will free spin, not stopping at 90° increments.
- Press and hold down the foot pedal, spin the rotor until the desired side appears, release the foot pedal. The rotor will stop at the next appropriate position in 90° increments.
- Lock the unit so that the pedal cannot be pushed down and the rotor cannot be moved.

Warranty

The entire installation is warranted against defects in material and workmanship for a minimum of five years, and the warranty includes labor. Additionally, the entire base, rotor bottom, and respective integrated components are warranted against defects in materials and workmanship for 10 years. All rotation surfaces on both the stationary base and the rotor bottom are warranted for a lifetime. Lifetime is defined as "for as long as the original owner possesses the equipment."

Mayline Group

Mayline Group manufactures a rotary file called ARC Rotary Files. ARC features include:

- Double-faced shelving rotates allowing two-sided access
- Available in six-, seven-, and eight-tier heights
- No foot pedal

- Full-height door pull and centered lock for easy operation
- Multimedia accessories
- May be used as a room divider that allows sharing of media by occupants on both sides