

H o r i z o n t a l
C a r o u s e l S y s t e m s



FKI Logistex
White Systems

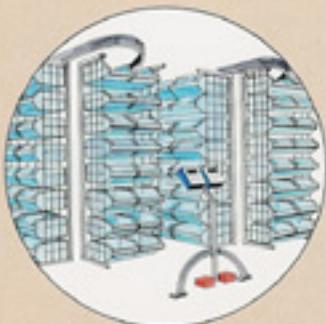
**Increase Customer Service, Throughput,
Order Accuracy, Storage Density and Labor Savings**



A horizontal carousel is an automated storage and retrieval device consisting of a series of linked bins mounted on an oval track. When activated, the bins rotate to bring the required items to the operator or an automated picker. The carousel can be controlled from a simple foot switch, to push-button microprocessor controls, to software controlled systems.

White's integrated horizontal carousel systems can be a major contributor to a company's ability to create and sustain its competitive advantage. As the inventor of the horizontal carousel — and now into its third generation of product innovations and improvements — White produces the widest selection of carousels and software solutions.

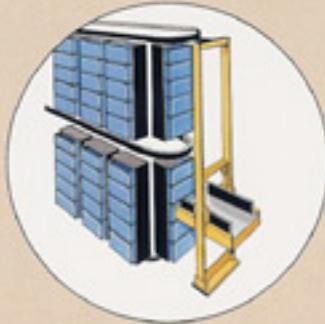
Scalable Carousel Systems to Meet Your Business Needs



Manual



Semi-automated



Automated

Benefits of White's Horizontal Carousel Systems:

Improved customer service –

System's flexibility and efficiency expands your capacity to provide your customers what they want, when they want it and how they want it. Integrating inventory control software, light-directed picking, and bar code scanning assures nearly 100% accuracy. White's software enables batch picking, hot pick flexibility, faster replenishment and reduced shortages. Transactions are high speed, tightly controlled, reliable and customer convenient.

Fast payback (ROI) – Increased efficiencies often allow companies to recover their investment within 16 months.

High throughput – Picking rates up to 950 lines per operator, per hour. Items are brought to the operator. Eliminates walk and search time. Minimizes reaching, bending and searching.

Reduced man-hours – Up to two-thirds of previously required man-hours can be saved. White's software automatically queues orders, batches picks and prepositions the carousels for picking.

High density – Companies have reclaimed up to 75% of otherwise wasted floor space. Carousels can be placed next to each other eliminating wasted aisle space. An assortment of bin heights and widths, instantly adjustable shelves and tiered carousels further maximize storage density.



White is the world's leader in carousel technology. Solutions-oriented thinking and proven results are why eight out of ten carousels in the world today say 'White.'

Extended cut-off times – Orders can be prioritized by computer based on shipping times. Increases ability to ship more orders in a day and extends same-day order shipment response.

Reduced inventory – By providing accurate and timely inventory data, both inventory levels and shortages can be reduced dramatically.

Continuous uptime – Durable and well-engineered, White's carousels provide nearly 100% uptime.

Easy integration – Can be interfaced with most inventory management software, WMS, ERP, and MRP systems that best meet your business requirements. White has an entire business group dedicated to writing and supporting software solutions.

More models – Starting with its invention of the top-drive carousel, White has produced a continuing stream of new designs that have dramatically enhanced productivity levels and have assured the correct equipment for virtually every customer application. *Bottom drive* units offer heavier duty performance and capacity, longer life, less maintenance and ease of serviceability. *Top drive* units are available for lower capacity and durability requirements. *Dual drive* units are designed for larger live loads, heavier duty cycles and allow precise bin positioning.

Twin Bin™ carousels double bin locations, and selectivity, and can reduce the number of carousels and workstations needed. *Robotic* carousels integrate inserter/extractor devices to provide automated discrete case, high speed buffering and consolidation. *Pallet* carousels are used to handle pallets, for building mixed pallet loads, picking, work-in-process (WIP) and buffering.

OneTouchDistribution.com™ (patent applied for) carousel system combines the benefits of A-frame speed, with flow rack replenishment, and pick-to-light accuracy. The system combines picking and consolidation into one very efficient process.

Productive, Cost-Effective Solutions for Distribution, Manufacturing and Office

Each application has unique requirements, but regardless of the facility you manage, the industries you serve or the products you handle, White delivers the right combination of system, software and support to provide dramatic savings for you in labor, time, space and materials.



High Density Stockroom Storage... carousels provide a high-density storage solution allowing the operator to service additional personnel because the items are brought to the operator. Eliminates walk and search. Increases productivity, accuracy and efficiency.



WIP Buffer... carousels serve as temporary repositories of assemblies and sub-assemblies... provides consistent flow between multiple work zones to maximize productivity.



Consolidation... putting into carousels to sort merchandise by routing, shipping destinations, or carrier speeds fulfillment... provides extended cut-off times, increased accuracy levels and customer flexibility.



Split Case Order Picking... a White horizontal carousel system delivers high throughput, density and accuracy for single SKUs or inner packs.



Automated Full Case Handling... carousels integrated with White's Storbot inserter/extractor robot allow cases to be stored, retrieved and delivered to remote workstations... can execute up to six transactions per minute... provides discrete selectivity, continuous throughput, picking, staging and buffering.



Picking and Consolidation... OneTouchDistribution.com™ combines picking, sorting, consolidation, shipping, dedicated and integrated replenishment, and returns into a single touch/high speed system. Saves space, time and labor; adapts to peak activity periods without added equipment or space investments.



Kitting... carousels are used for high-density storage, increased control and speed in building multiple kits.



Burn-in... carousels are equipped with power to each shelf within a bin. Product is placed on the shelf and plugged into the test circuit for a predetermined testing period... accommodates a wide variety of testing applications.



Environmentally Controlled Storage... manual or robotic carousels are equipped to handle "lights out," adverse or sensitive environmental conditions. From freezers, to clean rooms, to ovens, White's horizontal carousels can handle the harshest environments.



Progressive Assembly... continually revolving carousels enables work to be distributed or transported between workstations or quality control checkpoints. Utilizes less floor space than conventional carts... more cost-effective than automated transporters.



Buffer Storage... horizontal carousels even out workflow by providing temporary storage of materials and finished products. Items are accessed on an "as needed" basis.



Media... carousels used for high-density storage of computer cartridges, CDs and other electronic media, increase productivity, cost efficiency and reclaim space.



Office... NoWalk™ carousels provide enhanced productivity, high density, and very accurate records retrieval and filing. Files, X-rays or supplies are brought to the operator... eliminates walk and search time.

Industry's largest selection of horizontal carousels is at work in a wide range of warehousing, wholesale and retail distribution, manufacturing and office environments.



Pallet Handling... bottom drive carousel stores heavy-duty pallets for picking, buffering, WIP, building split pallet loads, and manufacturing applications. Eliminates wide aisles but retains fork truck accessibility.

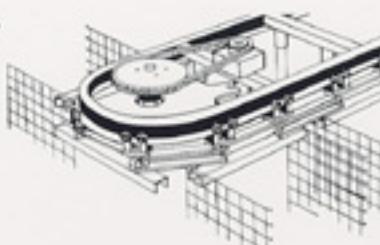
Markets

- Aerospace
- Automotive
- Books and Periodicals
- Chemicals
- Confectioneries
- E-commerce
- Electronics
- Entertainment Media
- Financial
- Food and Beverage
- Footwear
- Government
- Grocery
- Hardware
- Health and Beauty Aids
- Healthcare
- Industrial Supplies
- Mail Order
- Medical Devices
- Offices
- Pharmaceuticals
- Stationery Supplies
- Textiles
- Tobacco Products

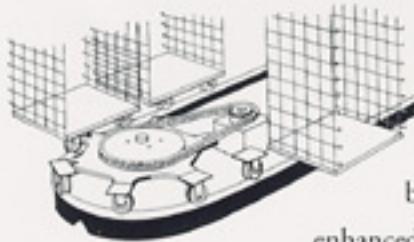
White has the world's most experience in designing, engineering, manufacturing and integrating horizontal carousels...we invented them! White pioneered the top drive carousel, then developed the bottom drive carousel, and then the patented Twin Bin carousel. White was first to computerize carousels and first to interface robotic devices. Over five decades of product development and innovation keeps White's customers on top of their business and industry.

Multiple models to meet your needs

Top drive. Top drive carousels are designed for standard and light duty applications. Double yoke or single yoke are uniquely designed to minimize yoke failure and stress and drag issues.



Bottom drive. Bottom drive and dual drive carousels from White are engineered for larger live loads (up to 2500 lbs. per bin) and heavier duty cycles. Increased

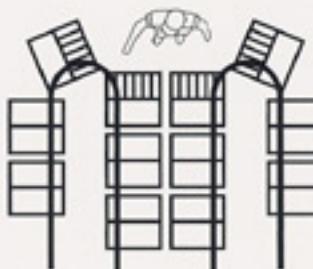


TBF (time between failure), less maintenance requirements, and equipment longevity are just some of the benefits designed into the bottom drive carousel by using easily accessible floor level motors, enhanced wheel and track point of contact and

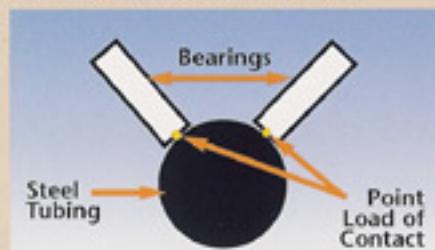
reduced bin stress due to eliminating yokes. Frame and track assembly distributes loads uniformly over a large floor area. **Dual drive** model, based on bottom drive design, has an additional drive sprocket that engages the links just below the upper guide track. The two sprockets are joined together by a torque tube that eliminates the twisting that can cause damage to wheels, tracks and bins during high activity operations.

Twin Bin.™ Based on White's bottom drive design, Twin Bin carousels are for small part picking applications requiring higher density, selectivity and throughput. Operator is presented with two picking faces at any one time.

Increases productivity while often reducing number of carousels, floor space requirements, workstations and man-hours required in many applications.

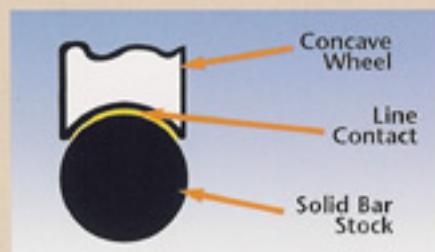


White designs multiple models of carousels to meet your usage, weight and maintenance requirements.



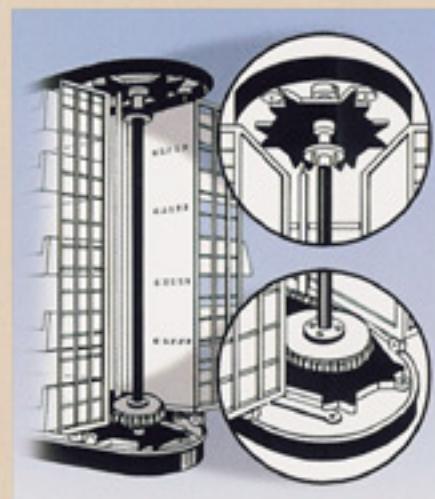
Top drive - point of contact

Bearings canted at a 45° angle ride on the tubular track on single points. White uses solid stamped steel yokes and 1½" diameter solid bar stock to increase efficiencies.



Bottom drive - line contact

Heavy-duty load bearing wheels run on 1½" diameter solid bar stock. Increased contact space and superior bearings provide heavy capacities, high duty cycles and longer carousel service.



Torque tube - bottom drive carousel

Bottom drive carousels incorporate a torque tube design. This allows the bin to be driven from the bottom and top simultaneously, virtually eliminating resultant angular displacement. Torque tube design provides longer wear, higher bin position accuracy and less bin/product movement.

AC Vector controls increase throughput & cost efficiency

All carousels utilize AC Vector controls that provide unsurpassed levels of speed, bin positioning, accuracy and ease of use. Off-the-shelf availability and plug and play design provide easy maintenance.

Custom bins, adjustable shelves

White offers a wide choice of bin depths, heights and widths, with adjustable, dust-free wire shelves that may be adjusted in moments to reflect increased density requirements or changing inventory specifications. Special bin designs, and industry specific applications or containers, can be accommodated.

Precisely matched software and controls

White offers several levels of off-the-shelf and customized software programs to meet specific application requirements...from simple transaction processing to full inventory control...from basic stock locating to sophisticated tracking and reporting.

Carousel systems can be implemented starting at simple manual operation using foot switches, or keypad controls which queue up to 250 picks, or software controls providing throughput levels to 950 picks per hour, batch picking up to 16 orders simultaneously and advanced inventory control.



Decades of software experience

White provides a comprehensive suite of Windows™-based inventory control systems. Fast and easy interface guides the new and experienced operator through essential warehouse operations. From batch picking, controlling carousels and off-carousel workzones, operating

light-directed picking systems, barcode scanning, hot picks, replenishment and supervisory reports, White's complete suite of software has multiple tiers designed to meet a facility's needs today and tomorrow. White has the largest software driven carousel system's installation base in the world.

Lightree III pick to light operation

White's carousels can be equipped with vertical Lightree III and horizontal Sortbar III light-directed picking systems to increase accuracy and picking speed.



The Lightree and Sortbar systems are comprised of multiple modules that can be adapted for unique and specific requirements. The Lightree modules have a large one-inch, dual-color, 10 character alphanumeric display plus two directional arrows. Easy plug and play connectivity allows the displays' modules to be infinitely adjustable to align with any current or future configuration of shelves or bins.

StorBot robotic systems

White's StorBot III family of robotic inserter extractors, for automated carousel systems, allows cases, totes and containers to be stored, retrieved and delivered to a remote workstation automatically via conveyor or other robotic device. No direct labor is required. Up to four tiers of carousels (60 feet) can be serviced by one StorBot device. Each device has a variable grip design to accommodate multiple sizes of corrugated cartons, totes and containers.



The StorBot III system, with AC vector drive, achieves vertical speeds to nine FPS, can do six transactions per minute, and is designed to operate 24/7/365.

In addition, White's StorBot II system provides a cost efficient, lower duty cycle requirement, discrete case handling alternative.

White Horizontal Carousels

Technical Data

		Top Drive	Bottom Drive	Twin Bin	Pallet
Bin Widths	max	36"	40"	30"	48"
	min	14.75"	14.75"	10"	36"
Bin Height	max	15'	15'	15'	8"
	min	3'	3'	3'	6"
Shelf Spacing	min	2" spacing .5" on center	2" spacing .5" on center	2" spacing .5" on center	NA
					NA
Shelf Weight Capacity	max	500 lbs	500 lbs	500 lbs	NA
	min	75 lbs	75 lbs	75 lbs	NA
Bin Weight Capacity	max	2500 lbs	2500 lbs	1000 lbs/face	3000 lbs
Rotation Speed	max	80 ft/min	80 ft/min	80 ft/min	40 ft/min
Number of Bins	min	10	10	20 (faces)	6
	max	150	150	300 (faces)	50
Carousel Length	max	180'	200'	200'	120'
	min	12'	12'	12'	18'
Carousel Width	max	96"	96"	96"	138"
	min	30"	30"	60"	138"
Dual Drive Model Available		Yes	Yes	Yes	Yes
Controls: A/C Vector		Yes	Yes	Yes	Yes
D/C		Yes	Yes	Yes	Yes
Solid Steel Track Design		Yes	Yes	Yes	Yes
Torque Tube Design		No	Yes	Yes	Yes
Horsepower	min	1 HP	1 HP	1 HP	1 HP
	max	Dual 3 HP	Dual 5 HP	Dual 5 HP	Dual 5 HP
Floor Load Distribution		Average	Excellent	Excellent	Good
Load Bearing Life		Average	Excellent	Excellent	Excellent
Serviceability		Average	Excellent	Excellent	Excellent
Seismic Rigidity		Average	Excellent	Excellent	Excellent

All dimensions are nominal and subject to change without notice.

White Sells Solutions

With the White Team, you get a group of professionals who have the experience, knowledge and technological resources to objectively evaluate your materials handling challenge and provide the proper business solution. From simulation engineering, project management, and mechanical, controls and software engineering...to installation, integration, acceptance testing and production start-up...White has the solution.

MTM BUSINESS SYSTEMS

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Service – Customer One Protection

Part of any solution ultimately depends on the depth and breadth of support service provided. White's Customer One Protection (COP) organization and its certified technicians are dedicated to providing customer service that keeps you satisfied. COP is the largest factory-trained carousel service group throughout North America. Services include training, telephone tech-support, field service including corrective and preventative maintenance, hardware and software support, spare and replacement parts service and component repair, and site audits. The "COP Hotline" enables you to reach a COP representative 24 hours a day, seven days a week.

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