

2008

MODERN LINEAR



MODERN LINEAR

TECHNOLOGY

All Modern Linear products incorporate the benefits of guide roller technology for customer applications:

QUIET

Linear guide rollers are very quiet as a result of the ball separation. Noise is magnified in recirculating guide systems when each ball collides with the one next to it in the ball path.



RUGGED

The radial bearings of Modern Linear guide rollers are offered with shields or rubber seals. The seal is superior to the wipers common in recirculating ball guides. Debris caught between the wheels and track is wiped away naturally. Ball bushings and ball rails use the shaft or rail as the inner race of the bearing making them susceptible to contamination failure.

440C stainless steel rollers and track are also available for corrosive environments.



ECONOMICAL

Modern Linear guide rollers are simple to design, install and maintain. In operation, the guide system is compliant and forgiving to mis-alignment and machining inaccuracies. These features result in lower initial, installed and total cost.

SMOOTH

Linear guide rollers are based on the design of radial ball bearings. The load carrying balls travel in a circular path and are retained and separated from one another. Current ball bushing and ball rail linear systems have a recirculation path that requires the balls to make a quick change in direction. Vibration occurs when the balls collide entering and leaving the load zone.

FAST

Recirculation guides are limited by the sharp turn the balls must make as they enter and leave the load zone. Guide rollers are only limited by the rotary speed of the radial bearing. Maximum guide roller speeds are up to 2X faster than ball bushings or ball rails.



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GUIDE ROLLER COMPONENTS

GUIDE ROLLERS

Superfinished raceways for superior smoothness and low noise.

Drop in replacement for existing guide rollers.

52100 or 440 stainless steel.

Sealed or shielded.

BUSHINGS

Knurled surface on eccentric bushing for superior hold at adjustment position.

Drop in replacement for existing adapter bushings.

Nickel plated for corrosion resistance.

TRACK

Single and double edge options.

V Edge is case hardened to 49-52 RC.

AISI 1045 or 420 Stainless.

Drilled or undrilled.

TRACK ASSEMBLY

Track can be mounted to any square edge.

Custom integration of all components into linear slide.

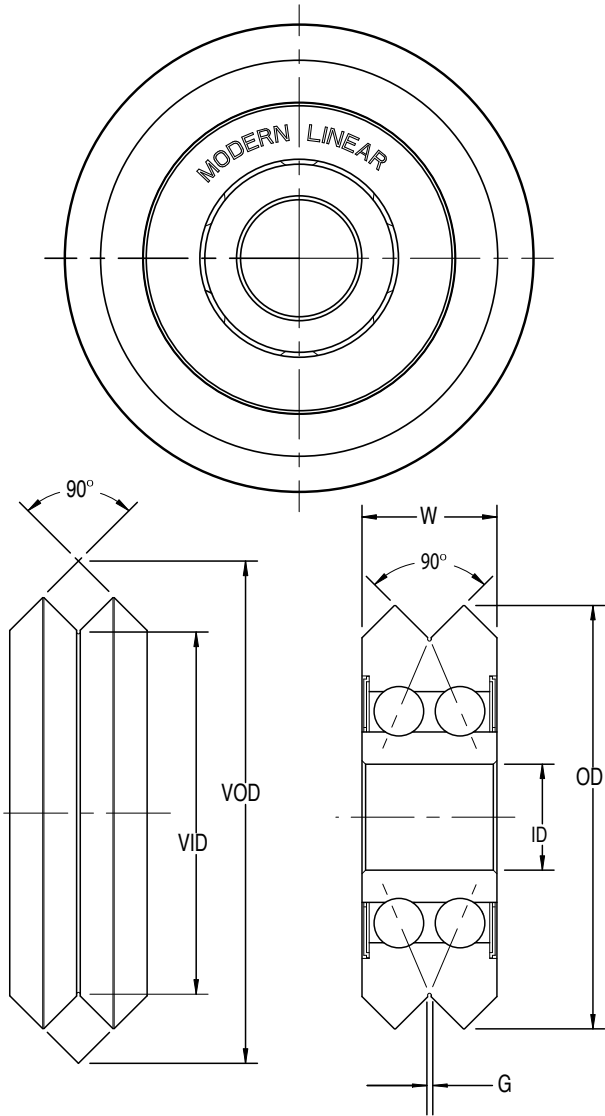
Track can be bolted or welded to steel beam.



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GUIDE ROLLERS

SIZES

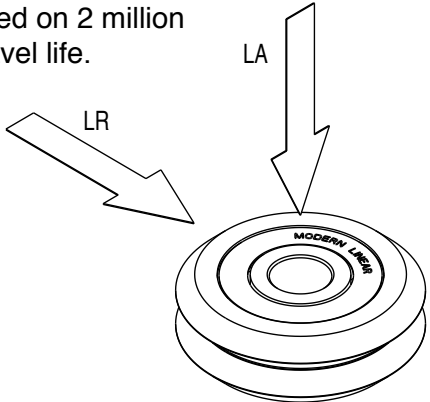


GUIDE ROLLER LOAD CAPACITY (LBS.)

SIZE	LR	LA	MAX RPM	WEIGHT
VW-1	134	57	2400	.027
VW-2	322	140	1500	.087
VW-3	691	382	1000	.300
VW-4	1058	899	750	.630
VW-4XL	1710	1480	500	1.20



Working load capacities reflect lubricated roller/track interface. Ratings based on 2 million inches of travel life.



SPECIFICATIONS

Ground, double row angular contact ball bearings, ABEC-5, pre-lubricated with NLGI #2 grease.

DIMENSIONS (INCHES)

SEALED	SEALED SS	SHIELDS	OD	ID	W	VID	VOD	G ± .002
VW-1X	VW-1SSX	VW-1	.77	.1875	.310	.625	.936	.050"
VW-2X	VW-2SSX	VW-2	1.21	.3750	.437	1.000	1.437	.040"
VW-3X	VW-3SSX	VW-3	1.80	.4724	.625	1.500	2.125	.040"
VW-4X	VW-4SSX	VW-4	2.36	.5906	.750	2.000	2.750	.040"
VW-4XXL	VW-4XLSSX	VW-4XL	2.97	.8661	1.000	2.500	3.500	.045"



Working temperature range of guide roller -30° C-100° C. Bearings can be modified to extend range.

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GUIDE ROLLER BUSHINGS

SIZES



SPECIFICATIONS

BX = Adjustable Bushing.

Eccentric mounting hole.
By rotating the BX bushing on its fastener, the clearance between the wheel and track can be adjusted.

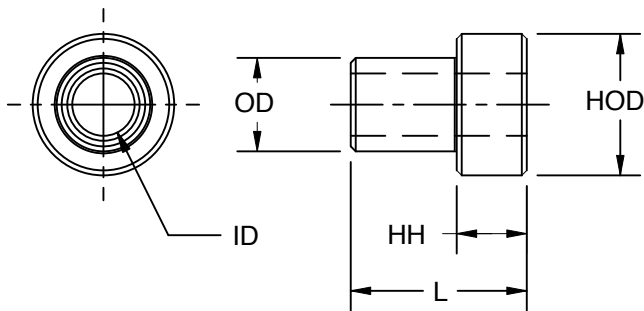
B = Stationary Bushing.

Concentric mounting hole.
The major load should be carried on the stationary bushings.

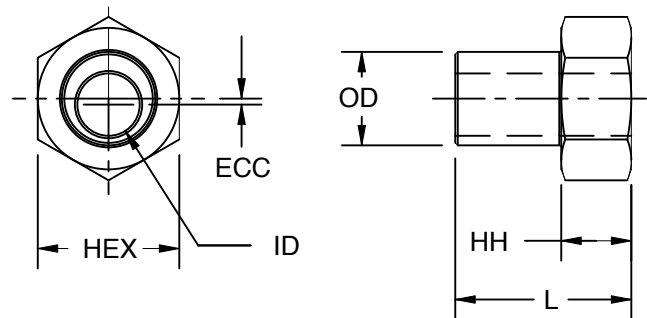
Material:

Carbon steel with electroless nickel plating.

Adjustable bushing has knurled face to hold position.



CONCENTRIC



ECCENTRIC

DIMENSIONS (INCHES)

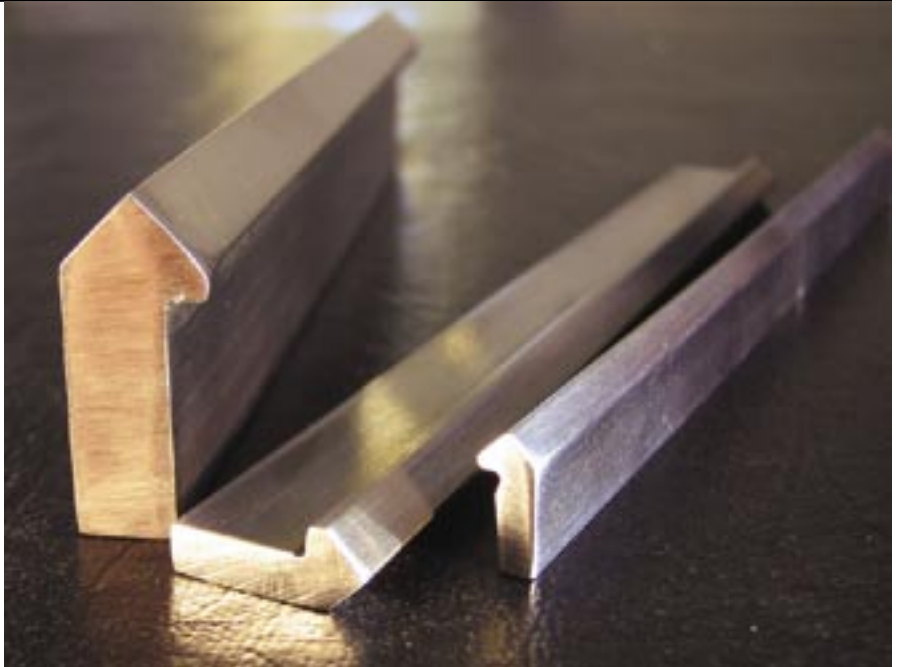
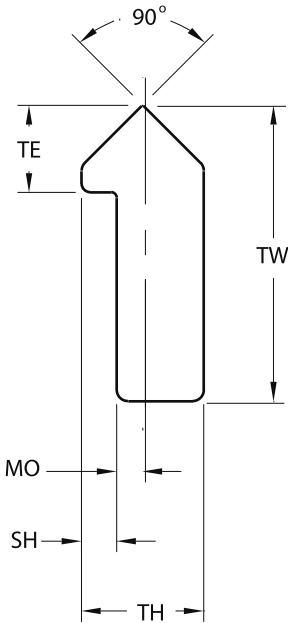
CON	ECC	ROLLER	L	OD	HEX	ID	*	ECC	HH	HOD
B-1	BX-1	VW-1	.550	.1873	7/16	.140	#6	.012	.250	.44
B-2	BX-2	VW-2	.706	.3748	9/16	.250	1/4	.024	.281	.56
B-3	BX-3	VW-3	.990	.4722	3/4	.312	5/16	.042	.375	.75
B-4	BX-4	VW-4	1.177	.5904	7/8	.375	3/8	.060	.437	.88
B-4XL	BX-4XL	VW-4XXL	1.555	.8650	1-1/4	.563	5/8	.060	.565	1.25



*Recommended fastener size.

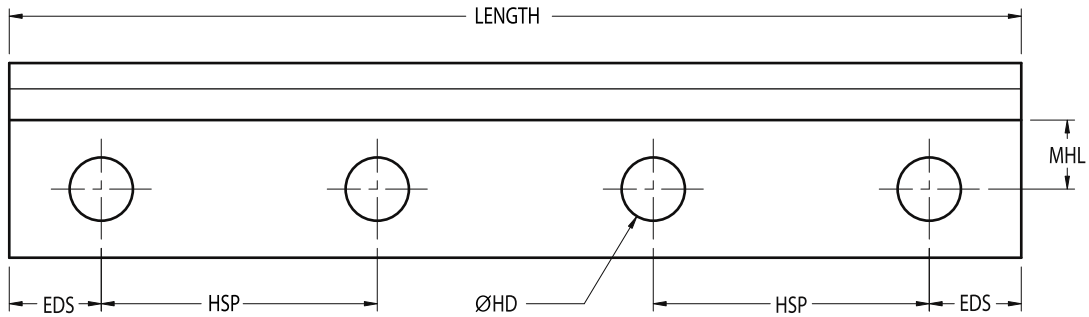
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TRACK



DIMENSIONS

Guide Roller Size	Width	Height	Mounting Shoulder Location	Mounting Shoulder to Center Line	Mounting Shoulder Depth	*End Hole Spacing	Hole to Hole Spacing	Hole Size Thru (Diameter)	Mounting Hole Location	Weight Per Foot
SIZE	TW	TH	TE	MO	SH	EDS	HSP	HD	MHL	
T-1	0.437	0.187	0.125	0.031	0.062	0.25	2.000	0.156	0.156	.183
T-2	0.625	0.250	0.187	0.031	0.094	0.31	3.000	0.203	0.219	.343
T-3	0.875	0.343	0.250	0.062	0.109	0.38	3.000	0.281	0.313	.690
T-4	1.062	0.437	0.312	0.093	0.125	0.50	4.000	0.344	0.375	1.10



SPECIFICATIONS

Track material is AISI 1045.

V-edge is case hardened to 49-52 Rc.

Cut to length tolerance +/- .063".

Hole spacing and size tolerance is +/- .005".

*For customer specified lengths end hole is positioned to be equal at both ends.

Track is available undrilled or predrilled and cut to length. Stainless material is 420SS, designated by -SS.

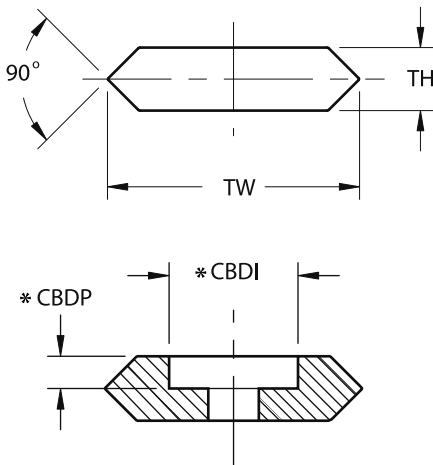
PART NUMBER EXAMPLE:

T-2 x 36" (Undrilled)

T-2 x 36" -9 (9 holes equally spaced)*

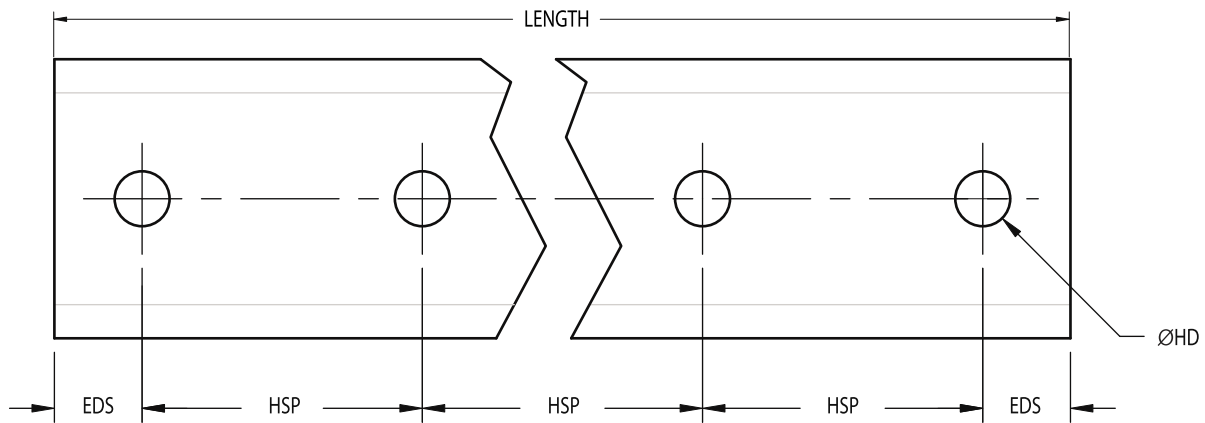
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DOUBLE TRACK



DIMENSIONS

Guide Roller Size	Width	Height	* End Hole Spacing	Hole to Hole Spacing	Hole Size Thru (Diameter)	Counter Bore Diameter	Counter Bore Depth	Weight Per Foot
SIZE	TW	TH	EDS	HSP	HD	*CBDI	*CBDP	
DT-1	.0750	0.187	0.25	2.000	0.156	0.313	0.100	.45
DT-2	1.000	0.250	0.31	3.000	0.219	0.500	0.125	.73
DT-3	1.250	0.375	0.38	3.000	0.313	0.625	0.188	1.33
DT-4	1.500	0.500	0.50	4.000	0.375	0.750	0.218	2.03



SPECIFICATIONS

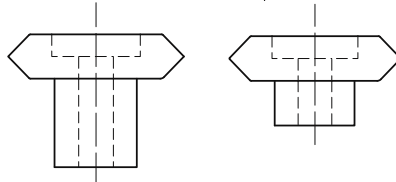
Track material is AISI 1045.

V-edge is case hardened to 49-52 Rc.

Cut to length tolerance +/- .063".

Hole spacing and size tolerance is +/- .005".

*For customer specified lengths end hole is positioned to be equal at both ends.



* Counter Bores Optional.

*Riser Blocks with Thru Holes.

Track is available undrilled or predrilled and cut to length.

Stainless material is 420SS, designated by -SS.

PART NUMBER EXAMPLE:

DT-2 x 36" (Undrilled)

DT-2 x 36" -9 (9 thru holes)

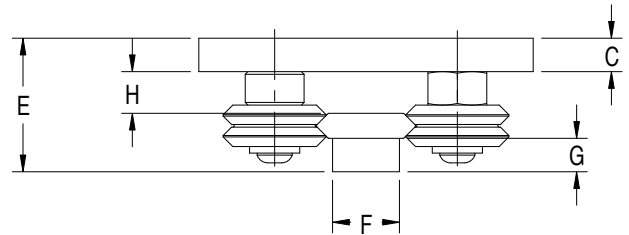
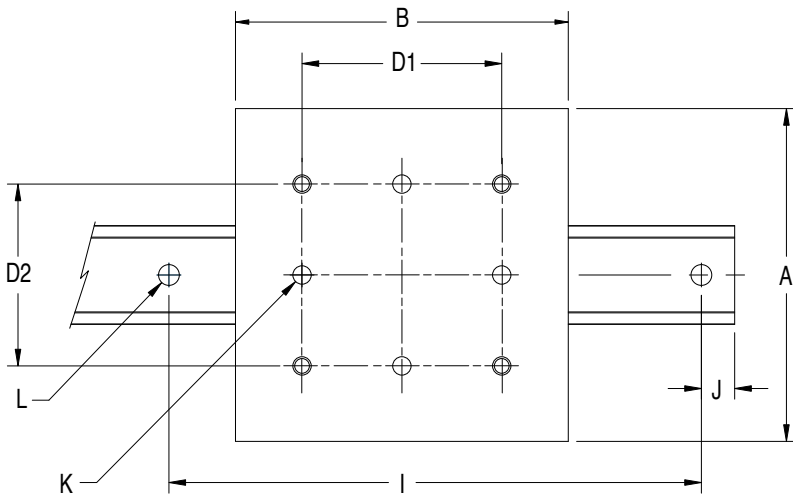
DT-2 x 36" -9CB (9 counterbored holes)

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DOUBLE TRACK LINEAR GUIDE

- Compact overall package
- Standard and custom lengths
- Easy to install

NEW



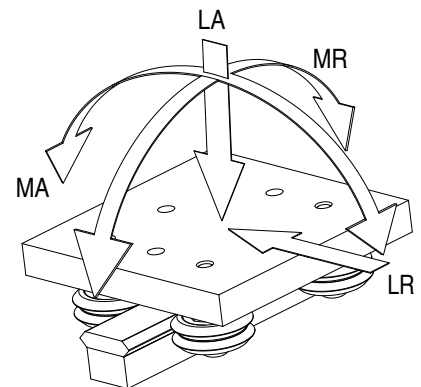
DIMENSIONS (INCHES)

SIZE	A	B	C	D1	D2	E	F	G	H	I	J	K	L	CARRIAGE	RAIL
DT-1	2.500	2.500	0.250	1.500	1.366	0.999	0.500	0.250	0.312	4.000	1.500	#6-32 UNC	5/32	DTC-1	DTR-1
DT-2	4.000	4.000	0.500	2.500	1.993	1.438	0.750	0.500	0.375	6.000	1.500	1/4-20 UNC	9/32	DTC-2	DTR-2
DT-3	5.000	5.000	0.500	3.000	2.738	1.750	0.750	0.500	0.500	8.000	1.500	5/16-18 UNC	11/32	DTC-3	DTR-3
DT-4	6.000	6.000	0.625	3.500	3.483	2.156	1.000	0.625	0.594	8.000	1.500	3/8-16 UNC	13/32	DTC-3	DTR-3

LOAD CAPACITY (LBS.)

SIZE	LBS.		FT-LBS.	
	LA	LR	MA	MR
DT-1	228	268	125	118
DT-2	560	644	505	434
DT-3	1528	1382	1776	1676
DT-4	3596	2116	5106	5091

Working load capacities reflect lubricated wheel/track interface.



ORDERING

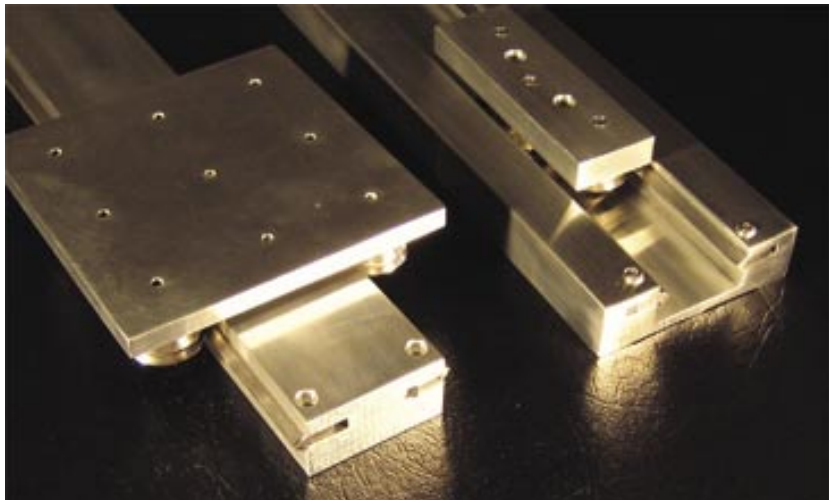
LINEAR GUIDE	DT-__	X __ (INCHES)
CARRIAGE	DTC-__	
RAIL	DTR-__	X __ *

* STANDARD LENGTHS
12,24,36,48 INCHES
MAX. LENGTH 48 INCHES

VECTOR

2 new styles of linear guide that incorporate a unique patent-pending compliant rail feature.

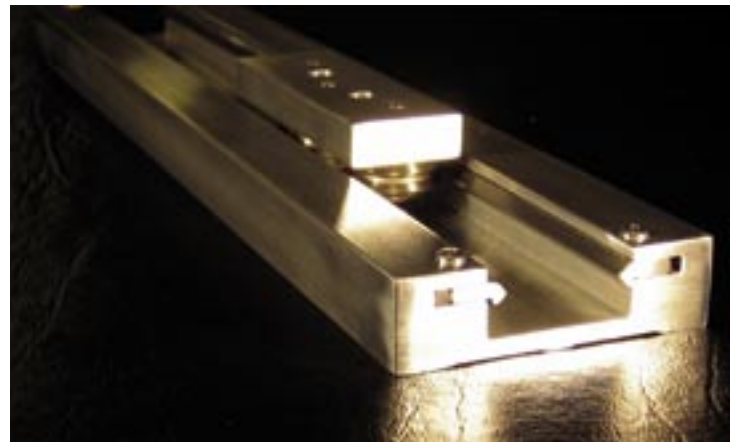
- Carriage is not adjustable.
- Ideal for transport applications.
- Rigid rail version also available.



The compliant rail design automatically adjusts for machining inaccuracies, misalignment and tolerance stack up to maintain fit up between the rail and carriage.

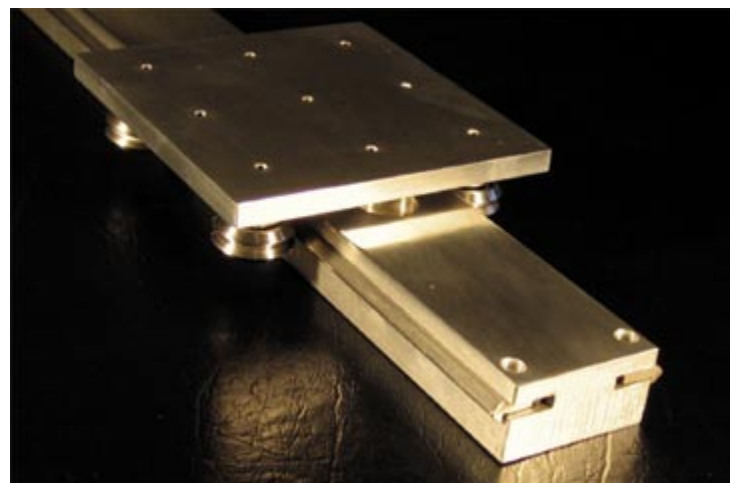
VECTOR / TRIO

- Compliant rail feature incorporated into a "U" shaped aluminum extrusion.
- 3 roller, in-line carriage design.
- Rollers are fixed, no adjustment required.



VECTOR / QUAD

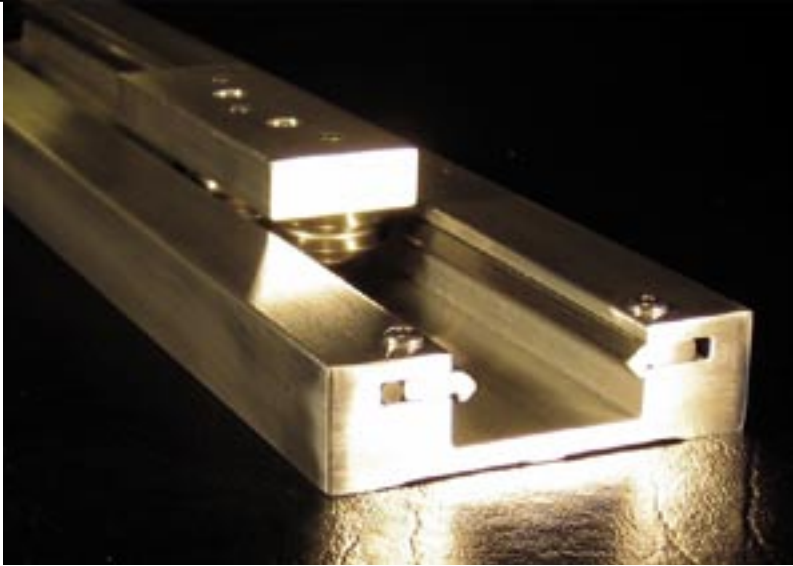
- 4 roller carriage design offers good load capacity.
- Low profile design.
- Ideal for single rail applications.



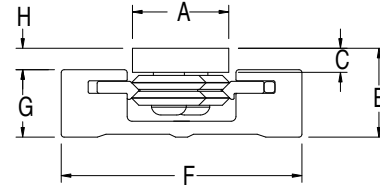
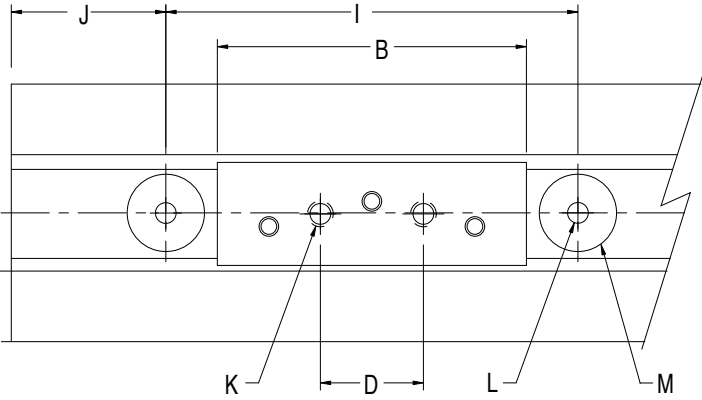
VECTOR / TRIO

VECTOR TRIO LINEAR GUIDE

- 3 roller carriage gives a compact design.
- Patent pending compliant rail feature.
- No need to adjust carriage fit up.
- Compliant rail adjusts to system inaccuracies.
- Standard and custom lengths.



NEW



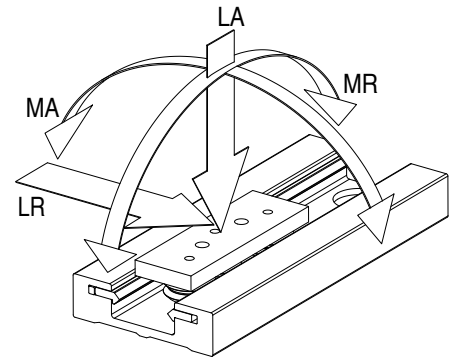
DIMENSIONS (INCHES)

SIZE	A	B	C	D	E	F	G	H	I	J	K	L	M	CARRIAGE	RAIL
VT-1	1.000	3.000	.250	1.000	.923	2.500	.700	.223	4.000	1.500	1/4-20 UNC	13/64	.75 X .10 DP	VTC-1	VTR-1
VT-2	1.400	4.250	.375	1.400	1.250	3.500	1.250	.260	6.000	1.500	5/16-18 UNC	9/32	1.00 X .20 DP	VTC-2	VTR-2
VT-3	2.000	6.000	.500	2.000	2.088	4.500	1.750	.338	8.000	1.500	3/8-16 UNC	13/32	1.00 X .30 DP	VTC-3	VTR-3

LOAD CAPACITY

SIZE	LBS.		FT-LBS.	
	LA	LR	MA	MR
VT-1	171	268	54	194
VT-2	420	644	190	701
VT-3	1146	1382	726	2789

Working load capacities reflect lubricated wheel/track interface.



ORDERING

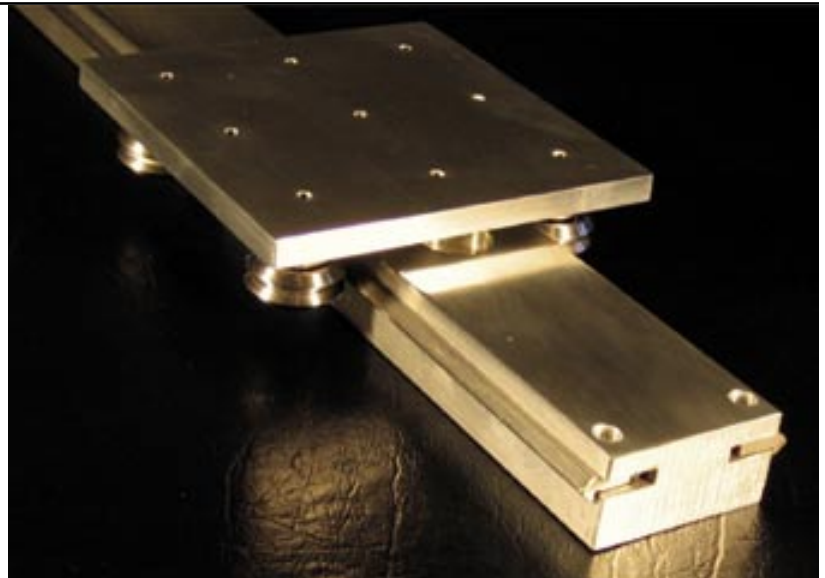
LINEAR GUIDE	VT-__	X __ (INCHES)
CARRIAGE	VTC-__	
RAIL	VTR-__	X __ *

* STANDARD LENGTHS
12,24,36,48,60 INCHES
MAX. LENGTH 120 INCHES

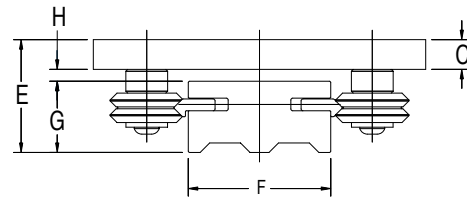
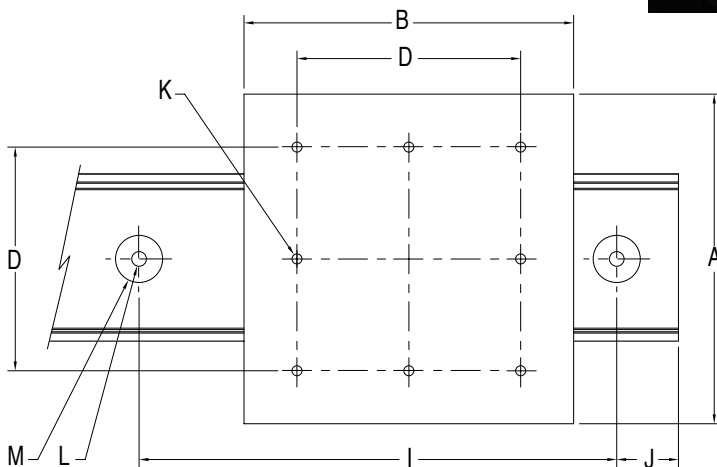
VECTOR / QUAD

VECTOR QUAD LINEAR GUIDE

- 4 roller carriage offers good load capacity in all directions.
- Standard and custom lengths.
- Low profile.
- Patent Pending compliant rail feature.



NEW



DIMENSIONS (INCHES)

SIZE	A	B	C	D	E	F	G	H	I	J	K	L	M	CARRIAGE	RAIL
VQ-1	3.500	3.500	.313	2.375	1.188	1.500	0.750	0.125	4.000	1.500	#6-32 UNC	5/32	.50 X .15 DP	VQC-1	VQR-1
VQ-2	4.750	4.750	.375	3.750	1.500	2.000	1.000	0.125	6.000	1.500	1/4-20 UNC	9/32	.75 X .25 DP	VQC-2	VQR-2
VQ-3	6.500	6.500	.375	4.500	1.755	2.500	1.250	0.130	8.000	1.500	5/16-18 UNC	11/32	.75 X .30 DP	VQC-3	VQR-3

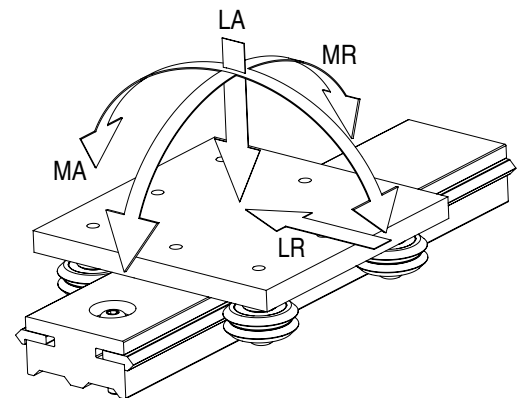
LOAD CAPACITY

SIZE	LBS.		FT-LBS.	
	LA	LR	MA	MR
VQ-1	228	268	175	175
VQ-2	560	644	680	680
VQ-3	1528	1382	2349	2349

Working load capacities reflect lubricated wheel/track interface.

ORDERING

LINEAR GUIDE	VQ-__	X __ (INCHES)
CARRIAGE	VQC-__	
RAIL	VQR-__	X __ *



* STANDARD LENGTHS
12,24,36,48,60 INCHES
MAX. LENGTH 120 INCHES

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MOUNTING AND ADJUSTMENT

The fixed bushing should be used to carry the heaviest loading. Preload the adjustable bushing so that the roller can just be turned by hand. Over-tightening the preload will cause premature wear of the components.

TRACK & WHEEL SIZE	XI (in.)
1	0.874
2	1.374
3	2
4	2.624
4XL	3.124

LUBRICATION / MATERIALS / SYSTEM LIFE

The guide rollers are grease lubricated and will not require any additional lube. The track should be lubricated for optimum performance and service life. Suggested lubricants are Mobil Vactra # 2 Way Oil, or Mobil Polyrex EP 2 Extreme Pressure Grease.

- Lubricated wheel/track interface refers to the presence of lubrication.
- Ratings are based on 2 million inches of travel life.
- Ratings have been confirmed by independent lab tests.

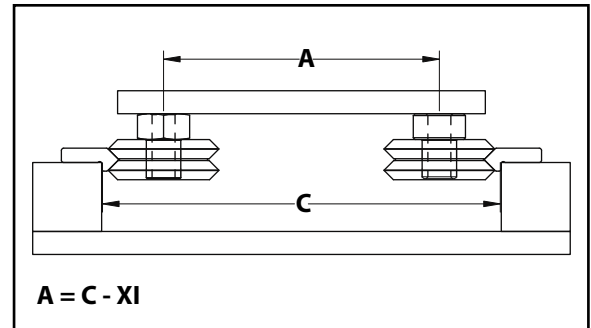
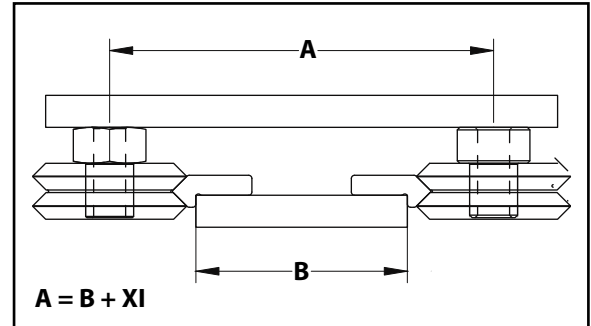
TRACK DERATE FACTORS		
	LUBRICATION	NO LUBRICATION
HARDENED TRACK	1.00	.50
UNHARDENED TRACK	.75	.25

SUGGESTED FASTENERS

BUSHINGS	
SIZE	ENGLISH
B-1	#6
B-2	1/4"
B-3	5/16"
B-4	3/8"
B-4XL	5/8"

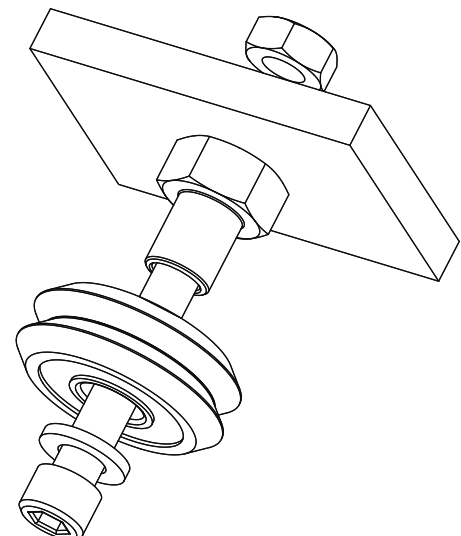
TRACK		
SIZE	ENGLISH	METRIC
T-1	#6	M3
T-2	#10	M6
T-3	1/4"	M6
T-4	5/16"	M6

CENTER DISTANCE FORMULA



ROLLER / BUSHING ASSEMBLY

Use SAE series N flat washers and lock washers to secure the roller bushing assemblies.



LOAD CALCULATIONS

L = applied load / number of roller pairs

L_R = roller radial load

L_o = roller load from applied moment

A = load offset dimension

B = track width dimension

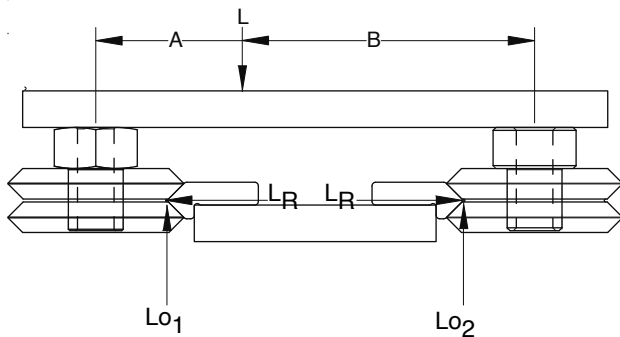
$F_A = .5$ for light duty, well lubricated use*

$F_A = 1$ for normal lubricated use*

$F_A = 2$ for dry, or harsh environments*

*Also consider lubrication comments.

LOAD CONDITION A

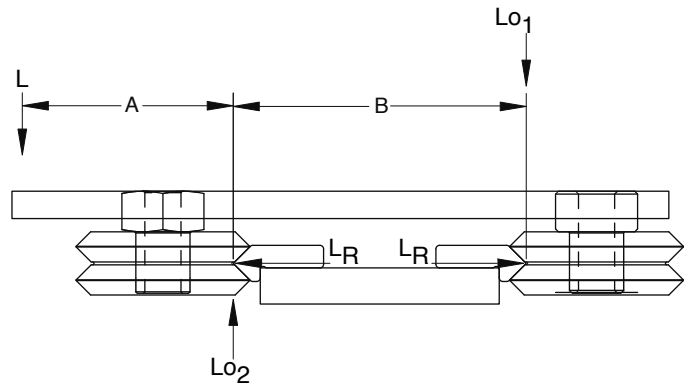


$$L_{o1} = \frac{L \times B \times F_A}{A + B}$$

$$L_{o2} = (L \times F_A) - L_{o1}$$

Compare the greater of these loads to the rated moment and radial load capacities.

LOAD CONDITION B



$$L_{o1} = \frac{L \times A \times F_A}{B}$$

$$L_{o2} = (L \times F_A) = L_{o1}$$

Compare the greater of these loads to the rated moment and radial load capacities.

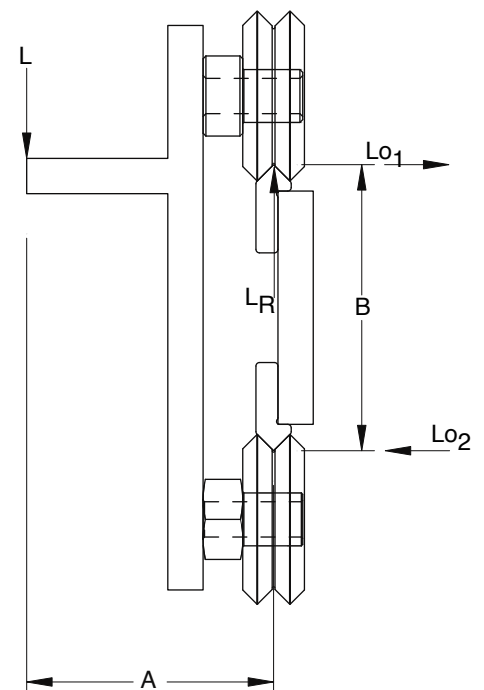
LOAD CONDITION C

$$L_{o2} = \frac{L \times A \times F_A}{B}$$

$$L_R = (L \times F_A) + L_{o1}$$

$$L_{o1} = L_{o2}$$

Compare the greater of these loads to the rated axial and radial load capacities of the roller.





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PO Box 186 Corte Madera, CA 94976

APPLICATION DATA SHEET

FAX BACK TO: 415-927-2360

OR EMAIL: info@modernlinear.com

Date _____

Company Name _____

Attention _____

Address _____

City _____

State _____

Zip _____

Phone _____

Email _____

Fax _____

Date Needed _____

Anticipated Number of Units _____

Stroke _____

Load _____

Velocity _____

Acceleration & Deceleration _____

Moment Load _____

Duty Cycle _____

Repeatability _____

Linear Accuracy _____

Operating Temperature _____

Life Requirement _____

System Orientation _____

Machine Description _____

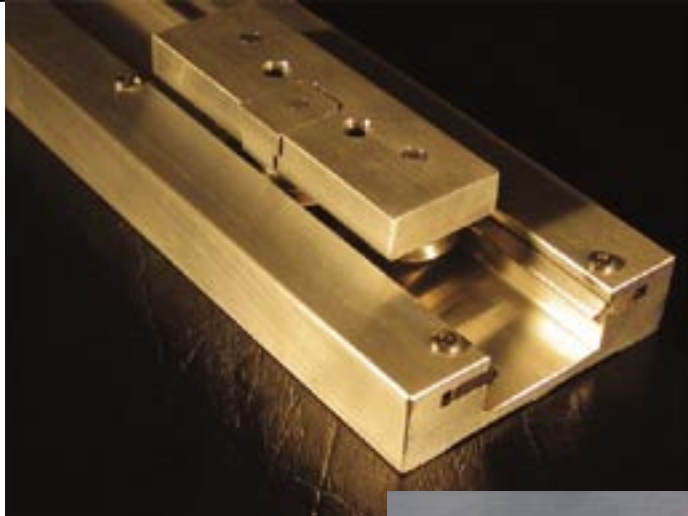
Comments and Questions _____

MODERN LINEAR

APPLICATIONS

PACKAGING

Compliant systems are easy to install and run smoothly on light weight machine frames. Guide rollers are resistant to contaminated environments.



ELECTRONICS

Many of the same benefits of guide rollers in medical applications are important for the electronic and semiconductor industries as well. Smoothness is particularly important in wafer transport applications.

MEDICAL

Guide rollers are smooth and quiet compared to recirculating ball guides. The bearings are permanently lubricated and sealed from the environment. Guide rollers can be run without external lubrication between the track and rollers. The system requires little maintenance or adjustment once installed.



COMMERCIAL

Guide rollers are excellent for door guides on industrial machinery and commercial applications. They offer low component cost and very good durability in applications where maintenance is infrequent.

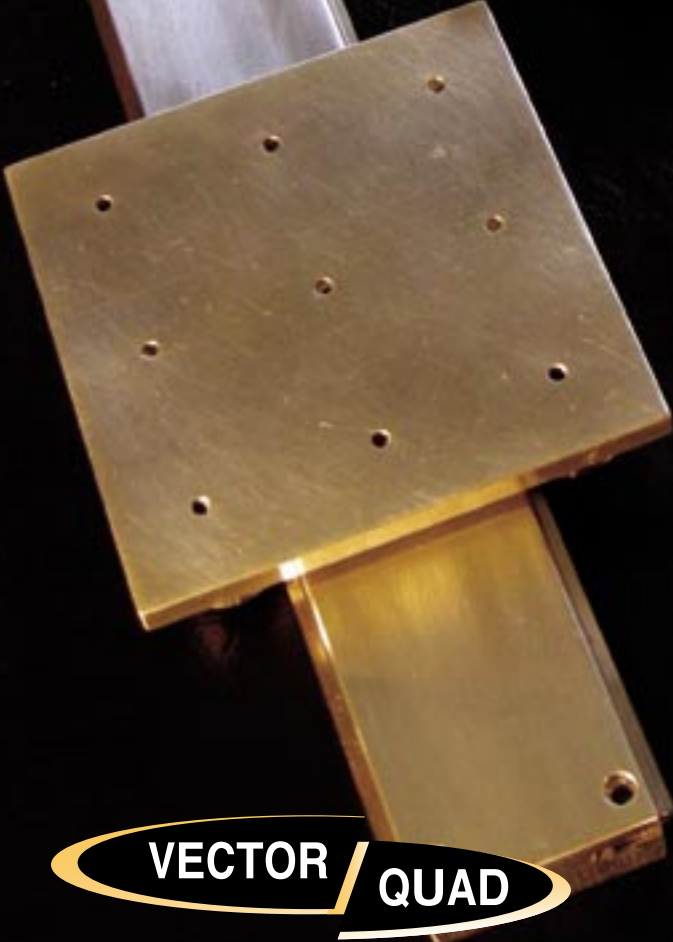
WOOD/CONSTRUCTION

Guide rollers are resistant to contamination and are extremely durable in shock load conditions.

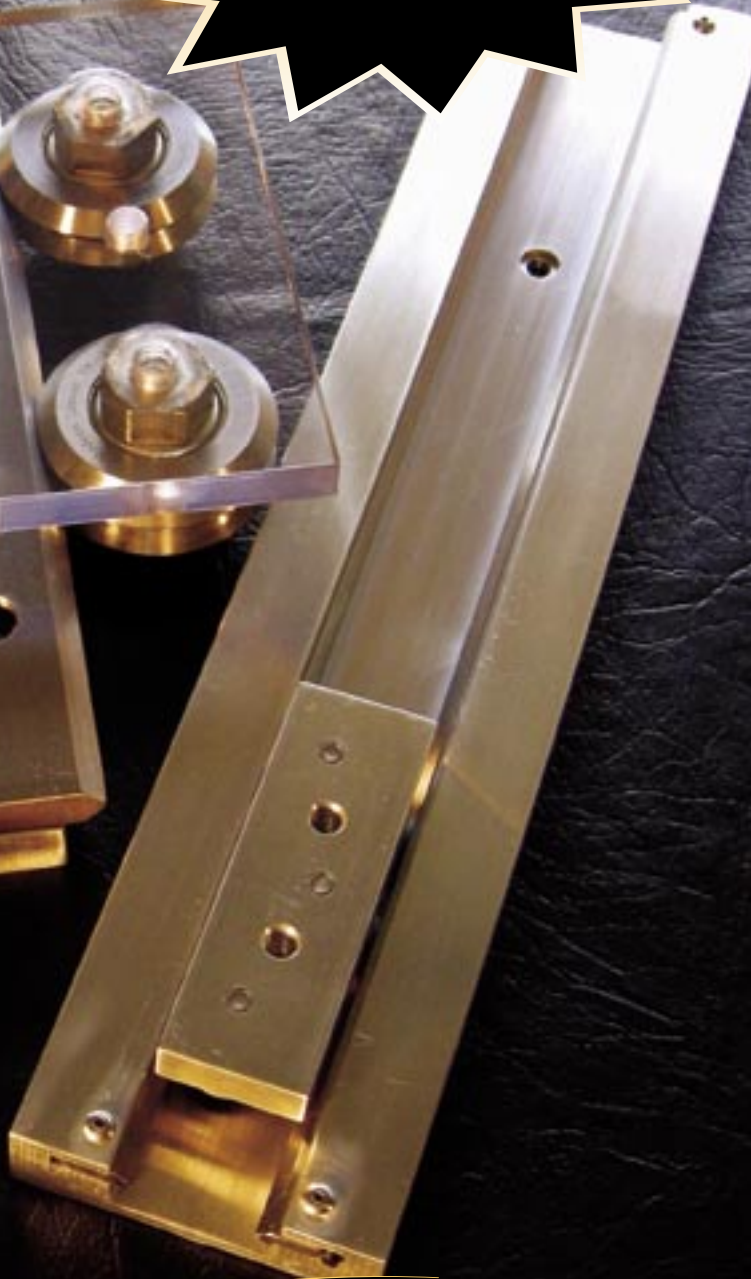
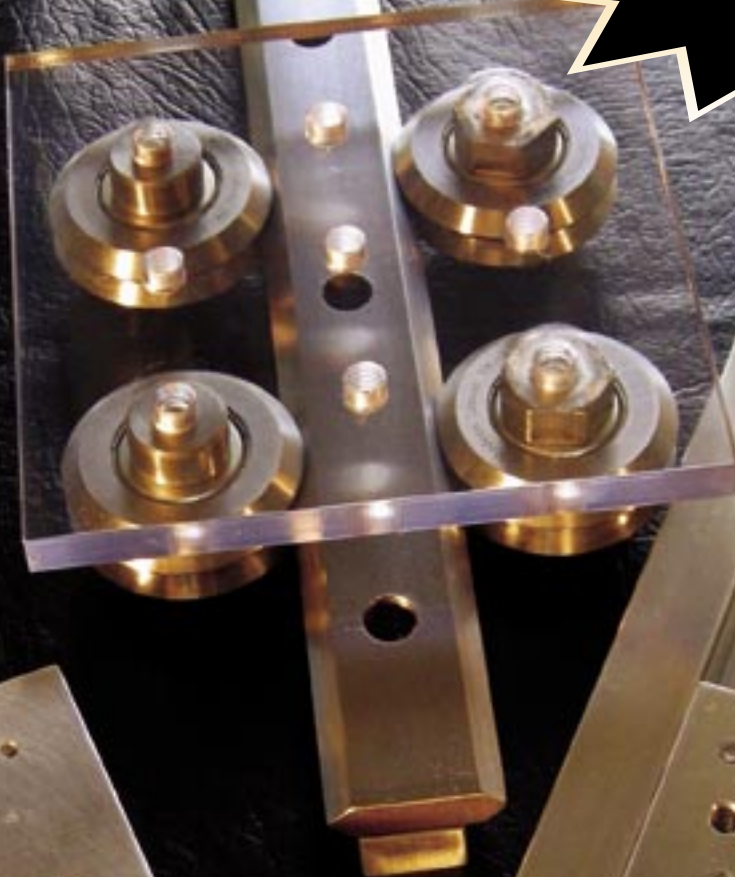


**DOUBLE EDGE TRACK
CARRIAGE & SPACERS**

NEW



VECTOR / QUAD



VECTOR / TRIO