



## Synchromesh Drive Systems

The Synchromesh Drive System represents an entirely new approach to synchronous drives. At the heart of the system is a drive cable, which replaces conventional timing belts as well as other means of transmitting synchronous motion. The cable consists of a core bundle of stranded stainless steel wires encapsulated in a nylon jacket. Wound spirally around the nylon jacket is another cable of similar construction. The spiral member is bonded to the core cable to provide functional stability under load. The pitch of the spiral winding is carefully controlled during the winding and bonding processes.

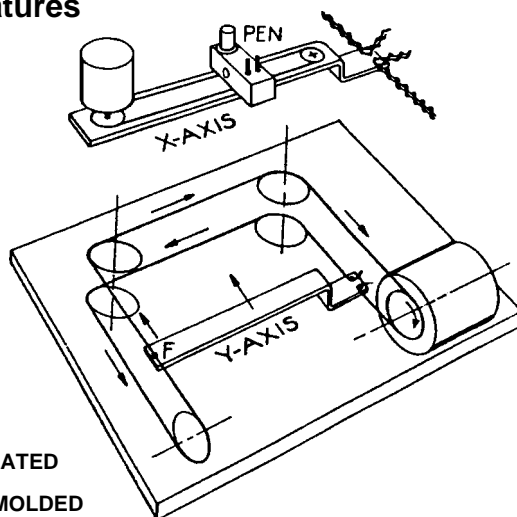
The use of stranded wire and nylon resin produces an extremely flexible cable that opens up new design possibilities, which were previously not possible with any other synchronous drives. The schematic diagram shown below illustrates the geometric features of an x-y plotter. Synchromesh cables are capable of changing operating planes, limited only by the size and proximity of adjacent pulleys. This unique characteristic makes it possible to produce this plotter design without employing expensive lead screw drive components. This is only one example of the countless possibilities offered with Synchromesh Drive Systems.

Complementing the Synchromesh cables are the drive pulleys, which have helical grooves on their outside diameter, to accurately engage the spiral convolutions on the drive cable. An additional radial groove of half round cross section supports the core cable and provides lateral stability. Synchromesh cables can be readily secured to other mechanism members in many different ways as well as those offered in the catalog pages.

Please note, however, that the Synchromesh Drive Systems are intended for reciprocating motion applications and cannot be made endless.

### Advantages and Design Features

- SYNCHRONOUS MOTION
- FLEXIBLE IN ALL DIRECTIONS
- MINIATURE IN SIZE
- HIGH STRENGTH
- SMALL BENDING RADIUS
- LIGHTWEIGHT
- LOW INERTIA
- LOW TENSION REQUIRED
- CHEMICALLY RESISTANT
- ELECTRICALLY CONDUCTIVE & INSULATED
- PULLEYS AVAILABLE MACHINED OR MOLDED
- EASY TO MOUNT ATTACHMENTS & END FITTINGS
- CABLES AVAILABLE UP TO 200 FEET LONG




**INCH/  
METRIC**
**Synchromesh Drive Selection Table**

Catalog Number		IDLER PULLEY STYLES			
CABLE	PULLEY	Steel / Ball Bearing	All Plastic	Plastic / Sintered Brg.	Nylon / Ball Bearing
A 6J 9-AS0605 or A 6J 9MAS0605	A 6P 9-060... or A 6P 9M060...	A 6C 9-00804 (.441)	A 6M 9-00804 (.493) A 6M 9-01004 (.611) A 6M 9-01204 (.709) A 6M 9-01606 (.861)	A 6T 9-00604 (.401) A 6T 9-00804 (.517) A 6T 9-01004 (.626) A 6T 9-01204 (.711)	A 6Z 9-01004 (.623) A 6Z9-01204 (.706) A 6Z 9-01604 (.906)
A 6J 9-AS0805 or A 6J 9MAS0805	A 6P 9-080... or A 6P 9M080...	A 6C 9-00804 (.489)	A 6M 9-01204 (.759) A 6M 9-01606 (1.009) A 6M 9-02006 (1.229)	A 6T 9-00804 (.544) A 6T 9-01204 (.769) A 6T 9-01706 (1.019) A 6T 9-02006 (1.179) A 6T 9-02008 (1.179)	A 6Z 9-01204 (.767) A 6Z 9-01604 (.992) A 6Z 9-02006 (1.199) A 6Z 9-01706 (1.029) A 6Z 9-02008 (1.199)
A 6J 9-AS1005 or A 6J 9MAS1005	A 6P 9-100... or A 6P 9M100...	—	A 6M 9-02408 (1.348)	A 6T 9-01706 (1.058) A 6T 9-02006 (1.253) A 6T 9-02008 (1.253) A 6T 9-02408 (1.348) A 6T 9-02412 (1.348)	A 6Z 9-02006 (1.258) A 6Z 9-01706 (1.064) A 6Z 9-02008 (1.258) A 6Z 9-02408 (1.388) A 6Z 9-02412 (1.388)
A 6J 9-AS1209 or A 6J 9MAS1209	A 6P 9-120... or A 6P 9M120...	A 6C 9-01606 (.866) A 6C 9-01706 (1.000)	A 6M 9-02408 (1.426) A 6M 9-02808 (1.476)	A 6T 9-02408 (1.421) A 6T 9-02808 (1.491) A 6T 9-02412 (1.421) A 6T 9-02812 (1.491)	A 6Z 9-02408 (1.476) A 6Z 9-02808 (1.501) A 6Z 9-02412 (1.476) A 6Z 9-02812 (1.501)

**NOTE:** Numbers shown in parentheses indicates pitch diameters of cable when wrapped around related pulley.

Example: Cable **A 6J 9-AS1005** when used with pulley A 6M 9-02408 has a pitch diameter of 1.348.

**METRIC SIZE BORES ARE AVAILABLE ON REQUEST.**



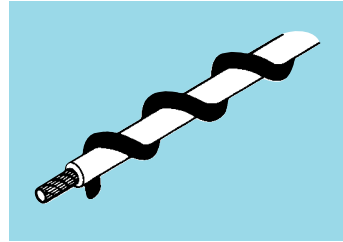
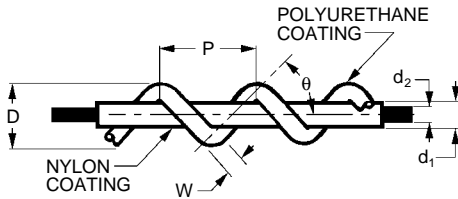
**INCH**

**Synchromesh Cable**

■ PATENTED

■ MINIATURE

■ SYNCHRONOUS



**LIFE DATA:**

10<sup>6</sup> minimum flexing cycles where:

**Pulley Pitch Radius (R)** = 13.9 x d<sub>2</sub>, and **Static Tension (T<sub>s</sub>)** = .05 x T<sub>B</sub>

**ACCURACY:**

1. Pitch Error ± .002 in.
2. Cumulative Pitch Error ± 0.16 in. max. over 100 pitches.

**AMBIENT FACTORS:**

1. Temperature Range -22°F to +176°F
2. Avoid strong acids, alkalies and organic solvents.

**MATERIAL:** Core - 304 Stainless Steel  
Casing - Nylon

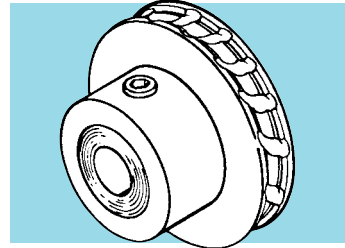
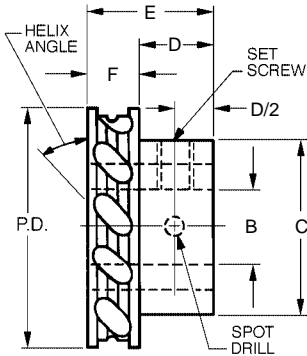
Priced Per Foot

Catalog Number	P Pitch	D Outside Diameter in.	d <sub>1</sub>	d <sub>2</sub>	W	θ Degrees	T <sub>B</sub> Minimum Tensile Load lbf
A 6J 9-AS0605	.120	.059	.024	.018	.028	45	40
A 6J 9-AS0805	.150	.081	.032	.025	.036	51	75
A 6J 9-AS1005	.200	.102	.039	.032	.045	42	130
A 6J 9-AS1209	.250	.134	.047	.039	.054	48	200



**INCH**

**Synchromesh Cable Pulleys**



**MATERIAL: Pulley - Acetal  
Insert - Brass\***

Catalog Number	Pitch	No. of Grooves	P.D.	B Bore +.001 -.000	F Face Width	E Length	C Hub Dia.	D Hub Proj. Ref.	Helix Angle	Set Screw
A 6P 9-0601504	.120	15	.573	.125	9/64	3/8	13/32	15/64	45°	#2-56
A 6P 9-0602004		20	.764	.125			#2-56			
A 6P 9-0602006		20	.764	.1875			#6-40			
A 6P 9-0602504		25	.955	.125			#2-56			
A 6P 9-0602506	25	.955	.1875	#6-40						
A 6P 9-0801506	.150	15	.716	.1875	9/64	3/8	35/64	15/64	51°	#6-40
A 6P 9-0801508		15	.716	.250			#8-32			
A 6P 9-0802406		24	1.146	.1875			#6-40			
A 6P 9-0802408	24	1.146	.250	#8-32						
A 6P 9-1001508	.200	15	.955	.250	3/16	1/2	5/8	5/16	42°	#8-32
A 6P 9-1001510		15	.955	.3125			5/8			
A 6P 9-1003008		30	1.910	.250			43/64			
A 6P 9-1003010		30	1.910	.3125			43/64			
A 6P 9-1201512	.250	15	1.193	.375	1/4	5/8	7/8	3/8	48°	#10-32
A 6P 9-1203012		30	2.387	.375						

\*Aluminum inserts used on .250 pitch pulleys.

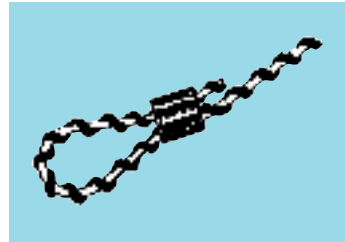
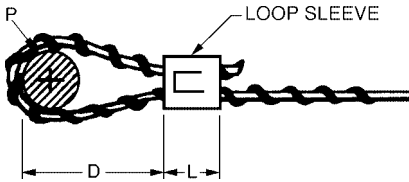
Also see Idler Pulley Series:

1. Steel with Ball Bearing - A 6C 9-...
2. Molded Nylon with Ball Bearing - A 6Z 9-...
3. Molded Nylon with Sintered Bronze Bearing - A 6T 9-...
4. Molded Acetal - A 6M 9-...



# Synchromesh Cable Attachments

## ■ LOOP SLEEVES



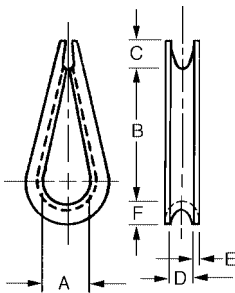
P = Pin Diameter  
D = Distance from bearing point to fitting

P should be at least five (5) times the cable diameter for guaranteed breaking strength and D should be at least 2.5 times P.

**MATERIAL:** Copper, Zinc Plated

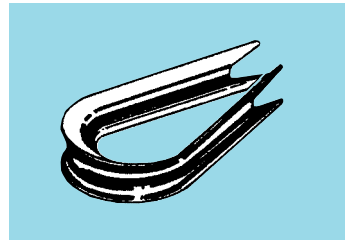
Priced Per 10 Pieces

Catalog Number	For Cable No.'s	L Length After Swaging
A 6B 9-S039	A 6J 9-AS0605	7/16
A 6B 9-S063	A 6J 9-AS0805	15/32
A 6B 9-S093	A 6J 9-AS1005	1/2
	A 6J 9-AS1209	



## ■ THIMBLES

**NOTE:**  
Thimbles provide loop support at higher loads and protect cables from wear when motion is present. Some thimbles may have open or uneven ends.



**MATERIAL:** Stainless Steel

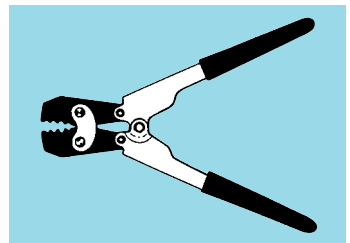
Priced Per 10 Pieces

Catalog Number	For Cable No.'s	A	B	C	D	E	F
A 6C 9-T015	A 6J 9-AS0605	.188	1/4	1/8	1/8	.015	3/64
A 6C 9-T047	A 6J 9-AS0805	.339	43/64	3/16	3/32	.032	5/64
	A 6J 9-AS1005						
A 6C 9-T094	A 6J 9-AS1209	.339	45/64	7/32	9/64	.032	5/64

## ■ CRIMPING TOOL

This precision crimping tool gives compound leverage of at least 15-1. The scissor-action plier-type tool has jaws which are made of a tough chrome alloy steel. All component parts of the tool are hardened and tempered. The handles have nonslip plastic grips. Easy to use.

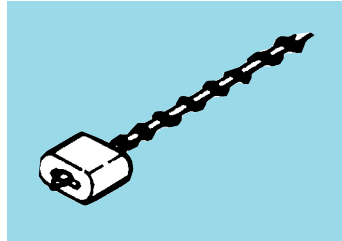
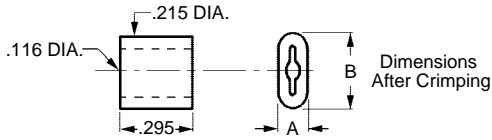
Catalog Number	For Cable Numbers
A 6O 9-00	A 6J 9-AS0605 A 6J 9-AS0805
A 6O 9-01	A 6J 9-AS1005 A 6J 9-AS1209





# Synchromesh Cable Attachments

## ■ PLUGS & EYES

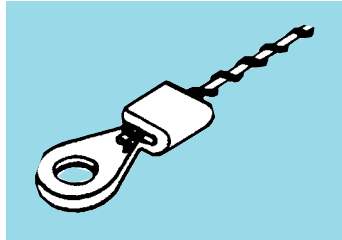
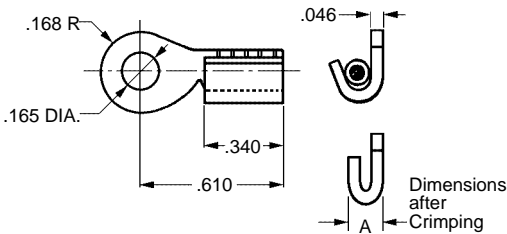


**MATERIAL:** Annealed Brass

Priced Per 10 Pieces

PLUGS			
Catalog Number	Used with Cable No.	A*	B
<b>A 6J 9-B103</b>	A 6J 9-AS0605	.111	.275
	A 6J 9-AS0805	.116	.273
	A 6J 9-AS1005	.120	.270
	A 6J 9-AS1209	.120	.270

\*Crimp plugs in vise or press to this dimension to obtain proper holding force.



Universal eyes fit all cable sizes and provide for convenient screw mounting.

**MATERIAL:** Low Carbon Steel

**FINISH:** Chromium\*\*

Priced Per 10 Pieces

EYES		
Catalog Number	Used with Cable No.	A
<b>A 6J 9-AA39</b>	A 6J 9-AS0605	.102
	A 6J 9-AS0805	.104
	A 6J 9-AS1005	.107
	* A 6J 9-AS1209	.110

\*Cable A 6J 9-AS1209 must have outer helical wire section removed prior to crimping for maximum holding force.

\*\*Meets EU standards.