Release Notes for ServoCam® v5.20k

Enhancements have been made since RN0037:

Primary Notes:

- Increased spindle capabilities by approximately 18% for the XL (1.625” spindle size)
- Added support for 1.25” spindle size XL
- Added XL capability to take selected axes “off-cam”.

(see next page for table of contents)

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System Workarounds for ServoCam® v5.20k

Designer BackShaft speed setting:

It is possible that the backshaft speed in an ultramatic part cycle can be specified to be 240 RPM. The Ultramatics should only run at 120 RPM. The BackShaft speed can now be set in the operations window. There is a small square gear picture, just under the “Run Expert” menu, that allows the backshaft speed setting to be changed.

Designer Settings File:

There is an issue of “if the servocam.ini file is read only, then expert settings are not saved, and there is no feedback to the user that the information is being lost.” To avoid this situation, have your system administrator be sure to set the permissions on the file ‘servocam.ini’ so that all people logged into the computer can have ‘read/write’ access to that file. This would also show up as though the ‘preferences’ are not being saved, since they are also stored in this file. If the Designer application is installed on a network drive, all users will be basically sharing the ini file, which could lead to the expert’s settings changing when you were not aware of it. The solution to this is to install the Designer application on each computer.

Controller Parts Counters:

The parts counter stores the lot count, bar-end count, and single cycle information in the controller’s battery backed memory. If the battery loses charge, then the controller will briefly display a message on start up that reads “Part counter history is not available on this machine. Resetting counters.” The copyright screen follows this one. If this happens, the controller will no longer retain the counter information from one power cycle to the next. Factory replacement of the battery is required to resolve this situation. Once powered up, the counters will still correctly stop the cycle as before, but the final counts will not be remembered the next time that the controller is powered off.

XL Tool Clear Considerations:

The XL Tool indexer features bi-directional indexing and is servo-driven. Currently the 'Tool-Clear Position' is established by entering the desired tool clearance into the 'previous' and 'next' tool positions. The system automatically clears to the position furthest away from the work. If you are indexing only one tool station at a time, then this is no different from the classic tool indexing.

However, now that the turret can index either direction and any number of stations (details are given later in the section titled **UltraTurn® Servoed Turret Indexing**) there may be tools ***between*** the 'previous' and 'next' positions. There is no automatic consideration of the lengths of these additional tools that might be in the indexing path.

The simple workaround for this is to use the longest tool position, subtract the longest of the 'previous' and 'next' tools from the longest tool position (of any tool on the turret) and add your typical clearance (0.250 if at zero is typical). This information is found on the 'Tools' page in the turret table. This will then clear any tool on the turret, no matter which direction the tool indexes. Remember that this is only necessary when you will be indexing past tools. If the tool stations are empty or if you are indexing one station at a time there is no need to take this precaution.

Longest tool on turret - longest of the 'previous' or 'next' tools + normal clearance = the number to enter in the 'previous' and 'next' box on the 'Clear' page.

Release Notes for ServoCam® Designer v5.20k

Designer Changes since v5.20c

1. Increased spindle capabilities by approximately 18% for the XL (1.625” spindle size). Spindle speeds up to 3535 RPM (standard) or 3064 RPM (reduced) are now possible.
2. Added support for 1.25” spindle size XL

Designer Restrictions on use of v5.20k

1. (none)

Designer Features of v5.20k

Timeline tick marks

There are now tick marks in several of the timeline operations. Below is a description of what those marks mean, and what they can be used for.

Operation	First tick mark	Second tick mark	Usage
Position	Time position is reached	(none)	The slide is still moving before this point. For UltraTurn® Spindle indexing, use this to know when it is ok to start the cross tool operation.
Clear	Time tools first become clear	Time tools will no longer be clear	The first tick shows the time where the tools are first clear of the workpiece. Use this time to know when it is ok to either index tooling, or index the workpiece. The second tick shows the time when the tooling will start to re-engage the workpiece, so be sure that all indexing is complete before this second tick mark.

UltraTurn® Spindle Indexing

Position-mode spindle operations (Position and Traverse) operate only in 3rd (4-speed) or Low (2-speed) or Fixed-ratio (1-speed). A *Speed-Change* operation must be used to switch from velocity mode to position mode, and vice versa. A *Traverse* operation must be used between two position operations. The spindle takes some of the initial time of the *Position* operation to actually get to the requested position; allow at least 0.5 second before expecting that the spindle have stopped moving, and is at the required position.

Example:

Turn
Speed Change
Position
Traverse
Position
Speed Change
Turn

Auto-computation of the spindle operation list is not supported for position mode. Auto-computation can be turned on to generate the operation list for the velocity-mode operations (only), and then turned off to allow manual addition of the position-mode operations.

(see next page)

UltraTurn® Servoed Turret Indexing

For machines equipped with a servoed turret indexer, the indexing direction is now dependent upon how many stations the turret has to move. The general rule is that the moves are ‘closest direction’, and for moves that are on the exact opposite side of the turret, the forward direction is preferred. For example:

For an 8 hole turret, moving from station 1:

Destination station	Holes moved	Direction on indexing
2	1	Forward
3	2	Forward
4	3	Forward
5	4	Forward
6	3	Backward
7	2	Backward
8	1	Backward

For an 6 hole turret, moving from station 1:

Destination station	Holes moved	Direction on indexing
2	1	Forward
3	2	Forward
4	3	Forward
5	2	Backward
6	1	Backward

(see next page)

UltraTurn® Control Limits

The UltraTurn™ software uses predefined limits of motion, velocity and acceleration to plan part cycles, and to control the slides and spindle.

Standard Spindle Speeds [zero to full speed time in seconds]:

Capacity	Ratios	1st (High)	2nd	3rd (Low) [Fixed]	4th
3/4"	2	5050 [1.36]		2760 [1.36]	
3/4"	4	5018 [1.49]	2757 [0.55]	1417 [1.49]	780 [0.55]
1 1/4"	2	3500 [1.36]		1912 [1.36]	
1 1/4"	4	3500 [1.56]	1923 [0.52]	988 [1.56]	544 [0.52]
1 5/8”	1			3000 [0.29]	
1 5/8”	2	3000 [1.85]		1638 [1.84]	
1 5/8”	4	3000 [1.31]	1648 [0.52]	847 [1.31]	466 [0.52]
2 3/8”	2	2500 [1.22]		1330 [1.22]	
2 3/8”	4	2500 [1.18]	1373 [0.48]	729 [1.18]	400 [0.48]

Reduced Spindle Speeds (maximums for 208 Volt systems) [zero to full speed time in seconds]:

Capacity	Ratios	1st (High)	2nd	3rd (Low)	4th
3/4"	2	4670 [1.25]		2550 [1.25]	
3/4"	4	4297 [1.27]	2361 [0.47]	1213 [1.27]	668 [0.47]
1 1/4"	2	3151 [1.23]		1722 [1.22]	
1 1/4"	4	3141 [1.40]	1726 [0.47]	887 [1.40]	488 [0.47]
1 5/8”	1			2540 [0.24]	
1 5/8”	2	2540 [1.56]		1388 [1.56]	
1 5/8”	4	2549 [1.11]	1400 [0.44]	720 [1.11]	396 [0.44]
2 3/8”	2	2167 [1.06]		1153 [1.06]	
2 3/8”	4	2263 [1.07]	1243 [0.43]	659 [1.07]	362 [0.43]

Note: For ‘Reduced Speed’, the ‘zero to full speed times’ are shorter since the torque is the same, but there is less far to go to get to ‘full speed’.

(see next page)

Best case Turret indexing times (tip – to – tip, for equal length tools)
(Clear time required with 'Maximum Tool Auto-Adjust' set to **0.000):**

Turret Indexing times for 8 holes:

Required Clear time (seconds)		Holes Moved						
Model	Method	1	2	3	4	5	6	7
00	Backshaft 120	0.26	0.86	1.47	2.07	2.68	3.28	3.88
00	Backshaft 240	0.14	0.47	0.80	1.13	1.46	1.79	2.12
2U	Backshaft 120	0.27	0.87	1.47	2.07	2.68	3.28	3.89
2U	Servoed	0.29	0.34	0.39	0.44	0.39	0.34	0.29

NOTE: These times are with the 'Maximum Tool Auto-Adjust' set as low as possible.

Turret Indexing times for 6 holes:

Required Clear time (seconds)		Holes Moved				
Model	Method	1	2	3	4	5
00	Backshaft 120	0.26	0.86	1.47	2.07	2.68
00	Backshaft 240	0.14	0.47	0.80	1.13	1.46
2U	Backshaft 120	0.26	0.87	1.47	2.07	2.68
2U	Servoed	0.31	0.38	0.44	0.38	0.31

NOTE: These times are with the 'Maximum Tool Auto-Adjust' set as low as possible.

(see next page for typical times)

Typical case Turret indexing times (tip – to – tip, for equal length tools)
(Clear time required with 'Maximum Tool Auto-Adjust' set to **0.100):**

Turret Indexing times for 8 holes:

Required Clear time (seconds)		Holes Moved						
Model	Method	1	2	3	4	5	6	7
00	Backshaft 120	0.32	0.92	1.53	2.13	2.73	3.34	3.94
00	Backshaft 240	0.20	0.53	0.86	1.19	1.51	1.84	2.17
2U	Backshaft 120	0.35	0.95	1.55	2.16	2.76	3.37	3.97
2U	Servoed	0.38	0.43	0.47	0.52	0.47	0.43	0.38

Turret Indexing times for 6 holes:

Required Clear time (seconds)		Holes Moved				
Model	Method	1	2	3	4	5
00	Backshaft 120	0.32	0.92	1.53	2.13	2.73
00	Backshaft 240	0.20	0.53	0.86	1.19	1.51
2U	Backshaft 120	0.35	0.95	1.55	2.16	2.76
2U	Servoed	0.39	0.46	0.52	0.46	0.39

(see next page)

Best case UltraTurn™ Spindle indexing times:

The best case is to move from a position toward a position of larger angle. The spindle index does a 'one sided approach', and going backward requires over travel in order to achieve the one sided approach. So, the best case is to already be moving in the direction of the one sided approach.

Time from clear to clear (seconds)			Total Angle moved (degrees)						
Model	Spindle Size	Ratios	15	30	60	90	180	270	360
2U	3/4"	1	-	-	-	-	-	-	-
2U	3/4"	2	0.48	0.40	0.47	0.52	0.63	0.71	0.78
2U	3/4"	4	0.65	0.55	0.64	0.71	0.86	0.97	1.06
2U	1 1/4"	1	-	-	-	-	-	-	-
2U	1 1/4"	2	0.57	0.48	0.56	0.62	0.75	0.85	0.93
2U	1 1/4"	4	0.75	0.64	0.75	0.83	1.00	1.13	1.23
2U	1 5/8"	1	0.22	0.18	0.22	0.24	0.29	0.33	0.36
2U	1 5/8"	2	0.65	0.55	0.64	0.72	0.87	0.98	1.07
2U	1 5/8"	4	0.75	0.64	0.74	0.83	1.00	1.13	1.23
3U	2 3/8"	1	-	-	-	-	-	-	-
3U	2 3/8"	2	0.57	0.48	0.57	0.63	0.76	0.86	0.94
3U	2 3/8"	4	0.79	0.67	0.78	0.87	1.05	1.19	1.30

(see next page)

The following slide coordinates are listed as Turret Slide (TS), Front Cross (FC), Rear Cross (RC), Front Vertical (FV), and Rear Vertical (RV).

#2 Regular Slides

You can get to the full range, but you have to leave space for the 'getting up to speed' when starting a feed near the fully retracted position.

- Vertical slides are interfering at the fully in position (FV 4.59 or less, RV 4.3 or less)
  TS 9.9762 to 3.0984
  FC 5.1900 to 3.4400 (slide adj set to 0.0000)
  RC 5.1900 to 3.4400 (slide adj set to 0.0000)
  FV 7.1000 to 4.1000
  RV 7.1000 to 4.1000

  FC 5.6900 to 3.9400 (slide adj set to 0.5000)
  RC 5.6900 to 3.9400 (slide adj set to 0.5000)

#3 Regular Slides

- Vertical slides are interfering at the fully in position (FV 4.59 or less, RV 4.3 or less)
  TS 9.9762 to 3.0984
  FC 5.1900 to 3.4400 (slide adj set to 0.0000)
  RC 5.1900 to 3.4400 (slide adj set to 0.0000)
  FV 7.7000 to 4.7000
  RV 7.7000 to 4.7000

  FC 5.6900 to 3.9400 (slide adj set to 0.5000)
  RC 5.6900 to 3.9400 (slide adj set to 0.5000)

#2 Ram Slides
- Vertical slides are interfering at the fully in position (FV 3.5 or less, RV 3.5 or less)
  TS 9.9762 to 3.0984
  FC 5.1900 to 3.4400 (slide adj set to 0.0000)
  RC 5.1900 to 3.4400 (slide adj set to 0.0000)
  FV 6.1100 to 3.1100
  RV 6.0900 to 3.0900

  FC 5.6900 to 3.9400 (slide adj set to 0.5000)
  RC 5.6900 to 3.9400 (slide adj set to 0.5000)

#3 Ram Slides
- Vertical slides are interfering at the fully in position (FV 3.5 or less, RV 3.5 or less)
  TS 9.9762 to 3.0984
  FC 5.1900 to 3.4400 (slide adj set to 0.0000)
  RC 5.1900 to 3.4400 (slide adj set to 0.0000)
  FV 6.1100 to 3.1100
  RV 6.0900 to 3.0900

  FC 5.6900 to 3.9400 (slide adj set to 0.5000)
  RC 5.6900 to 3.9400 (slide adj set to 0.5000)

Designer Known Issues in v5.20k

1. (none)

Release Notes for ServoCam® Controller v5.20k

Controller Changes since v5.20c

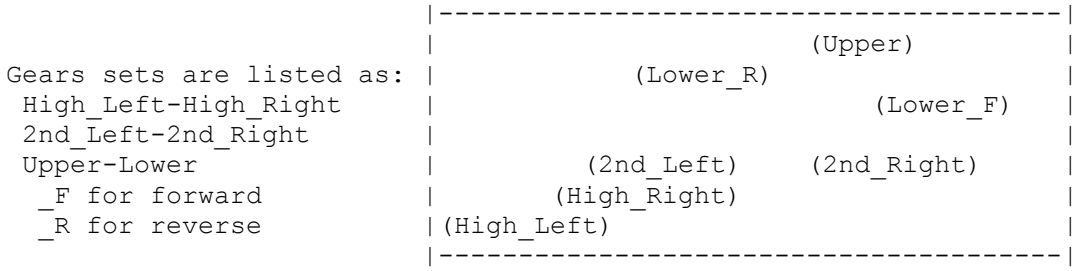
1. (none)

Controller Restrictions on use of v5.20k

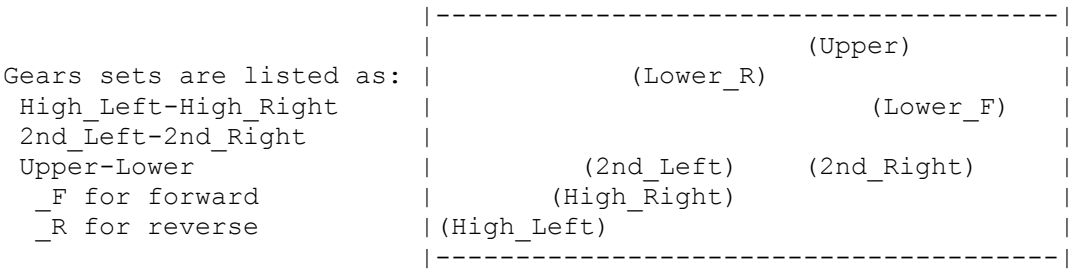
1. Manual moves of an unlocated slide must be done with caution near the ends of travel because the slide will **not** stop automatically, and could cause a fault. The locate process should be completed before moving a slide manually, unless tool/part interference prohibits it.
2. Spindle Transmission Set-up: The spindle speed shown in the run-time spindle status screen, and in the manual-move spindle screen, is shown for the transmission ratio expected by the ServoCam® system. If the spindle clutch has not been synchronized with the expected state (as would normally be done before going on-cam), the spindle speed displayed will be incorrect. In this case, the speed can still be adjusted, but the display will not reflect the true speed.
3. Spindle clutches and base clutches must be in proper working order in order to complete shifts within the time expected by the part cycle. Base clutches in particular can stick and significantly extend the shift time, if they have not been maintained and used regularly. Follow Brown-and-Sharpe maintenance procedures to correct sticking clutches. It may be necessary to construct a part cycle with appropriate shifts to exercise the clutches.
4. DNC requires DNC Server Version 1.10a or higher.

(see next page)

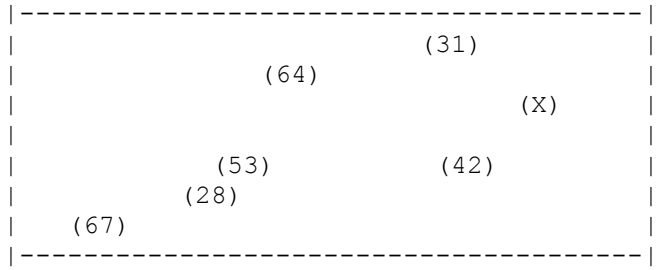
5. UltraTurn®: The spindle gears must be set correctly to get the correct RPM and positions at the spindle:



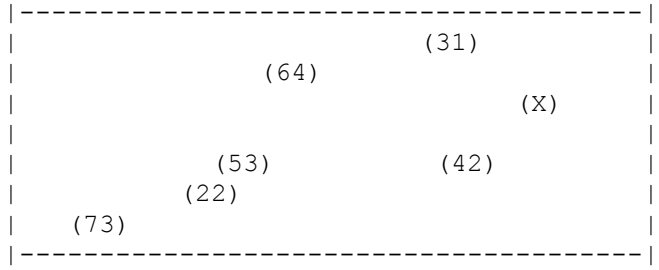
Machine Base Spindle Size Speeds Transmission	Gears	Spindle Clutch Splits (reversing)	Base Clutch Splits	Double Shift Splits (reversing)
2B-0.750-2	67-28 53-42 31-64_R	HtoL = -1.8453		
2-0.750-2	73-22 53-42 31-64_R	HtoL = -1.8261		
2-1.250-2	73-22 53-42 31-64_R	HtoL = -1.8253		
2-1.625-2	70-25 53-42 31-64_R	HtoL = -1.8253		
3-2.375-2	70-25 53-42 35-60_R	HtoL = -1.8792		
2-0.750-4	73-22 39-56 46-49_R	1^{st}to3^{rd} = -3.5392 2^{nd}to4^{th} = -3.5392	1^{st}to2^{nd} = 1.8188 3^{rd}to4^{th} = 1.8188	1^{st}to4^{th} = -6.4372 2^{nd}to3^{rd} = -1.9459
2-1.250-4	73-22 39-56 46-49_R	1^{st}to3^{rd} = -3.5377 2^{nd}to4^{th} = -3.5377	1^{st}to2^{nd} = 1.8188 3^{rd}to4^{th} = 1.8188	1^{st}to4^{th} = -6.4344 2^{nd}to3^{rd} = -1.9451
2-1.250-4-CNC	73-22 39-56 46-49_R	1^{st}to3^{rd} = -3.5377 2^{nd}to4^{th} = -3.5377	1^{st}to2^{nd} = 1.8120 3^{rd}to4^{th} = 1.8120	1^{st}to4^{th} = -6.4102 2^{nd}to3^{rd} = -1.9524
2-1.625-4	70-25 39-56 46-49_R	1^{st}to3^{rd} = -3.5377 2^{nd}to4^{th} = -3.5377	1^{st}to2^{nd} = 1.8188 3^{rd}to4^{th} = 1.8188	1^{st}to4^{th} = -6.4344 2^{nd}to3^{rd} = -1.9451
2-1.625-4-CNC	70-25 39-56 46-49_R	1^{st}to3^{rd} = -3.5377 2^{nd}to4^{th} = -3.5377	1^{st}to2^{nd} = 1.8120 3^{rd}to4^{th} = 1.8120	1^{st}to4^{th} = -6.4102 2^{nd}to3^{rd} = -1.9524
3-2.375-4	70-25 39-56 49-46_R	1^{st}to3^{rd} = -3.4315 2^{nd}to4^{th} = -3.4315	1^{st}to2^{nd} = 1.8188 3^{rd}to4^{th} = 1.8188	1^{st}to4^{th} = -6.2412 2^{nd}to3^{rd} = -1.8867
3-2.375-4-CNC	70-25 39-56 49-46_R	1^{st}to3^{rd} = -3.4315 2^{nd}to4^{th} = -3.4315	1^{st}to2^{nd} = 1.8120 3^{rd}to4^{th} = 1.8120	1^{st}to4^{th} = -6.2178 2^{nd}to3^{rd} = -1.8938



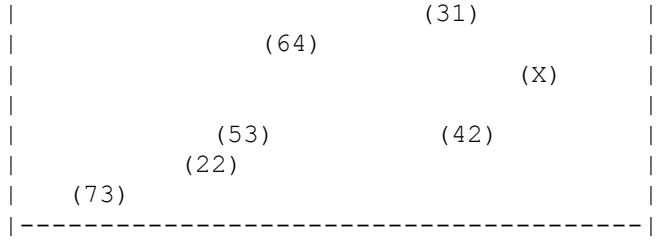
Spindle Gears for: #2 **British** machine, 3/4", **2 speed** (2B-0.750-2)



Spindle Gears for: #2 **Ultramatic** machine, 3/4", **2 speed** (2-0.750-2)



Spindle Gears for: #2 **Ultramatic** machine, 1 1/4", **2 speed** (2-1.250-2)



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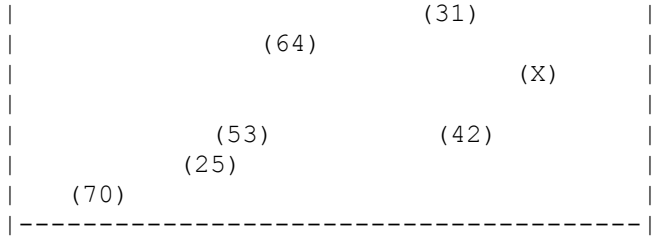
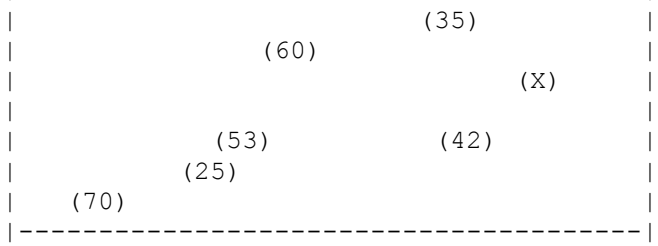
Spindle Gears for: #2 **Ultramatic** machine, 1 5/8", **2 speed** (2-1.625-2)



Spindle Gears for: #3 **Ultramatic** machine, 2 3/8", **2 speed** (3-2.375-2)



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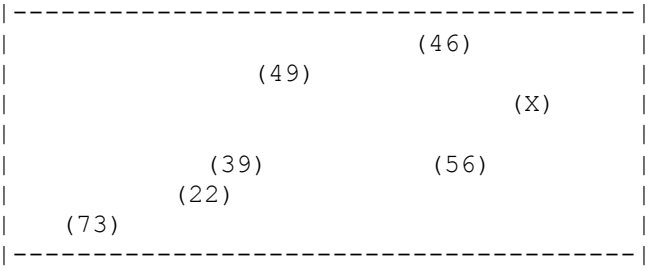
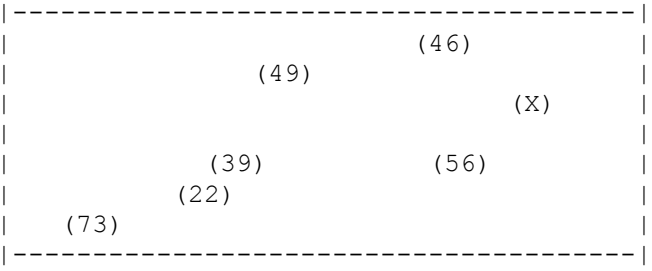
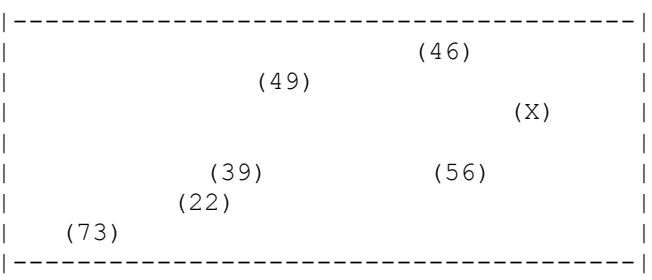
Spindle Gears for: #2 **Ultramatic** machine, 3/4", **4 speed** (2-0.750-4)



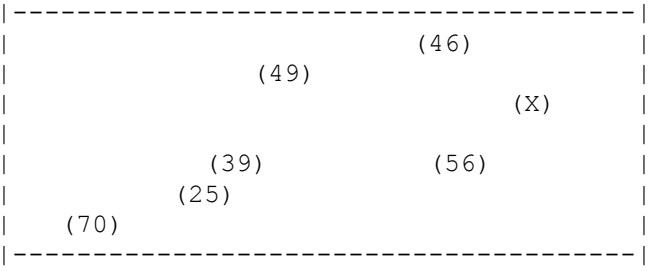
Spindle Gears for: #2 **Ultramatic** machine, 1 1/4", **4 speed** (2-1.250-4)



Spindle Gears for: #2 **CNC** machine, 1 1/4", **4 speed** (2-1.250-4-CNC)



Spindle Gears for: #2 **Ultramatic** machine, 1 5/8", **4 speed** (2-1.625-4)



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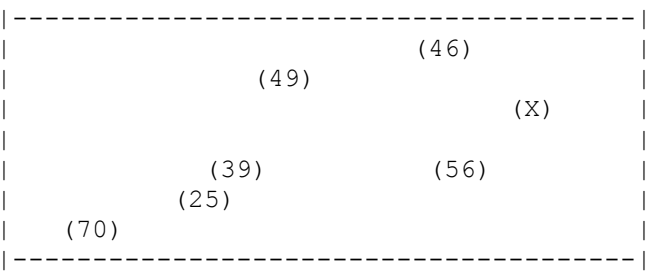
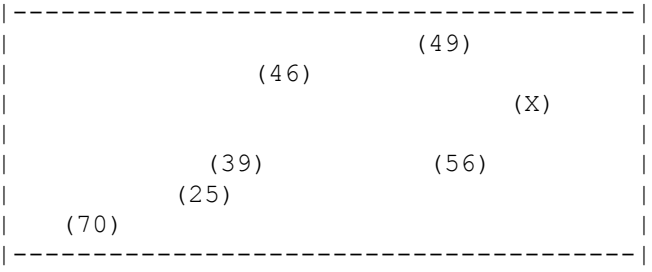
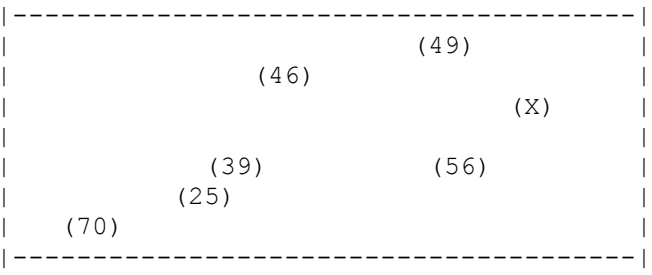
Spindle Gears for: #2 **CNC** machine, 1 5/8", **4 speed** (2-1.625-4-CNC)



Spindle Gears for: #3 **Ultramatic** machine, 2 3/8", **4 speed** (2-2.375-4)



Spindle Gears for: #3 **CNC** machine, 2 3/8", **4 speed** (2-2.375-4-CNC)



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Controller Features of v5.20k

1. The temperature display for the slide controllers shows a percentage. For the spindle, a reading of 85% means that the controller is full hot, and the motor will not be able to change speeds at full capability. Above this 85% reading, the spindle will likely fault at the next turn change or speed change.

For the front and rear slides and cross slides, any value up to 100% will still provide full function.

For any controller, a reading above 100% will cause the slide to fault the machine.

2. Turret offset adjustment is now also available for 00 and 2U UltraSlide (turret) Systems.

a. 2A can be adjusted up to 0.118 inches.

b. 00 can be adjusted up to 0.118 inches.

c. 2U can be adjusted up to 0.098 inches.

To set the adjustment:

1. Load a part cycle.
2. Enter the 'run' screen.
3. Index the turret to an empty tool station.
4. Insert a gauge block (a pair of 1-2-3 blocks) to make 6 inches between the closed collet, and the face of the turret.
5. Using the yellow arrow keys, move the turret toward the spindle until the gauge block is just flat and snug.
6. Use the 6 inches as the 'distance measured' and use the reading on the ServoCam® controller for the 'calibration point'.
7. Calculate the offset by subtracting the display distance from the measured distance.
8. Type this offset number into the following menu:

   Advanced menu | Service menu | Set turr actr offst
9. Then, press the 'ENTER' key to accept the new value.
10. The controller then shows:

    Offset change
    is pending.
    Power off then on to
    activate new offset.

11. Power off the system. Power on the system. Recheck the calibration point.

Example turret offset measurement:

Calibration Point (On ServoCam® display)	Distance Measured	Turret Actuator Offset (Meas-Disp)
6.0321	6.0000	-0.0321

(see next page)

Controller Known Issues in v5.20k

1. There is a line voltage condition that can cause servo amplifier damage. If the incoming line voltage, normally 240V, exceeds 300V for even a few seconds, then the shunt circuitry of the amplifier could be ruined.

This would not necessarily blow any fuses. The next time the system is turned on, if the shunt is shorted, then the system will not be able to pre-charge the amplifiers. If, however, the shunt is blown open, then it will allow pre-charge, but will not be able to dump energy during a stopping event, and will fault due to an “amplifier faulted” event; due to the internal bus voltage exceeding the maximum allow voltage.

This condition might be possible to monitor in software, as a side effect of the triggering of the shunt circuit. If so, there could be a future version of software that would trigger a fault based on this.

Main Controller Software Update (Gray box)

Procedure

1. Switch off the power to the ServoCam® controller.

2. Open the ServoCam®controller and insert the diskette labeled *ServoCam®Mast. Controller Update Disk* in the floppy drive.

3. Switch on the power to the ServoCam®controller. *After about 20 seconds*, the display will show a prompt. Select the option for "Install Update, and press the "ENTER" key.

```
Select Action
 Cancel
>Install Update
```

4. Select the choice for "Install Update" using the down arrow, followed by the "ENTER" key. *After about 5 seconds*, the display will show the following message:

```
    Installing
  ServoCam update

Copying EXE file ...
```

5. When the update is complete, the display will show the following message:

```
  ServoCam update
      complete
Replace diskette and
 power off then on
```

6. The Main Controller update is now complete.

Network Controller Software Update (Remotes)

Procedure

1. Switch off the power to the ServoCam® controller.

2. Open the ServoCam®controller and insert the diskette labeled *ServoCam®Slave Controller Update Disk* in the floppy drive.

3. Switch on the power to the ServoCam®controller. *After about 20 seconds*, the display will show a prompt. Select the option for "Install Update, and press the "ENTER" key.

```
Select Action
 Cancel
>Install Update
```

4. Select the choice for "Install Update" using the down arrow, followed by the "ENTER" key. *After about 5 seconds*, the display will show message similar to the following message: (as the update proceeds, the display will change, indicating the type of file being copied)

```
    Installing
  ServoCam update

Copying EXE file ...
```

5. When the update is complete, the display will show the following message:

```
  ServoCam update
      complete
Replace diskette and
 power off then on
```

6. The Software update is now complete.