**Materials List**

- **Minimum tools required:**
  - Drill press & Drill bits ("#7", "F", 5/16", ¼", 17/64", ½", ",O", 1")
  - Tap Handle & Taps (¼-20, 5/16-18, ½-13)
  - Hacksaw
  - Flat file
  - Dial or Digital Calipers
  - Center Punch & Hammer
  - Scribe
  - Square

- **Steel & Aluminum**

  1. ¾"x5"x6" **Cold** or **Hot** Roll Steel Rectangle (Rear Support)
  2. ¾"x3"x6" **Cold** or **Hot** Roll Steel Rectangle (Front Support)
  3. ¾"x5"x5" **Cold** or **Hot** Roll Steel Rectangle (Bearing Supports)
  4. ¾"x1⅛"x2" **Cold** Roll Steel Rectangle (Tracking Pivot/Roller Mount)
  5. ¾"x2"x9" **Cold** Roll Steel Rectangle (Tension/Tracking Arm)
  6. ¾"x2"x5" **Cold** Roll Steel Rectangle (Tension/Tracking Arm Support)
  7. ½"x2½"x12" **Cold** Roll Steel Rectangle (Upper & Lower Main Arm)
  8. ½"x1½"x12" **Cold** Roll Steel Rectangle (Main Arm Sides, L & R)
  9. ½"x1"x2" **Cold** Roll Steel Rectangle (Tracking Pivot Mounts)
  10. 1½"x1½"x20" **Cold** or **Hot** Roll Steel Square Bar (Tooling Arm)
  11. ¼"x18"x18" **Cold** Roll Steel Plate (Base Mounting Plate)

**Optional Items If Desired**

1. ½"x4"x6" **Cold** Roll Steel Rectangle (Work Rest)
2. ½"x1½"x12" **Cold** Roll Steel Rectangle (Work Rest Support Arm)
3. .375" (or .500") x6"x12" Aluminum 6061-T6 Rectangle (Platen or Slack Belt Attachments)
4. ¼"x2"x2"x6" **Hot** Roll Steel Angle (Platen Mount)
5. .375"x2"x8" **Cold** Roll Steel Rectangle (Platen)

*The steel and aluminum I purchased initially from Online Metals because they had reasonable prices and they would cut the stock to the length I needed. I've since acquired a small metal cutting bandsaw and now buy my metal from a local supplier. You can use either **Cold** or **Hot** roll steel, which ever is available. The main difference in the two is strictly appearance. **Cold** roll is smoother, **Hot** roll will have some scale, as a general rule.*

Online Metals
1138 West Ewing
Seattle, WA 98119
(800) 704-2157 OR (206) 285-8603
Fax: (800) 533-6350 OR (206) 285-7836
Rollers, Pulleys and Contact Wheels

Rob Frink
Beaumont Metal Works
362 Beaumont Rd.
Columbus, OH  43214
(614) 263-5656 - Phone
(614) 261-0094 - Fax
http://www.beaumontmetalworks.com

Once you have decided on a motor to use, contact Rob Frink and talk to him about the size of the drive and idler wheels you will need to achieve the proper belt speeds. Rob is an excellent resource and is very willing to help in any way that he can. Rob is also an excellent source for drive pulleys and motors if you don’t have any other source.

Knobs, Handles, Bearings and Drive Shaft Material

McMaster-Carr Supply Company
9630 Norwalk Blvd.
Santa Fe Springs, CA 90670
(562) 692-5911 - Phone
http://www.mcmaster.com

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I’m sure that these items are available from other sources; I just have found this company excellent to deal with and do business with them with my “regular” job.

Bolts, Springs and Miscellaneous Hardware

Most of the bolts, nuts, washers, springs and miscellaneous parts I purchased from my local Ace Hardware Store.

1 - ½ -13x24" Ready-Bolt
12 - ½ -13 Nuts
1 - 5/16 -18x12" - Ready-Bolt
14 - ½ -20x3/4" - Flat head bolts
14 - ½ -20x1" - Flat head bolts
6 - ½ -20x1½" - Flat head bolts
1 - 5/16 -18x2½" - Cap Screw
8 - ¼ -20-x1" - Cap Screws
4 - ½ -2-x2½" - Flat head bolts
4 - ¼ -2-x3" - Flat head bolts
1 - Spring (Tracking Control)
1 - Spring (Tracking Support)
8 - ¼" Flat Washers
1 - 5/16 -18 NyLok Nut
Construction Tips

This is going to be a project that will take several nights and or weekends to complete. Don’t try to rush through it and the end result will be a grinder that works better than you ever imagined.

- Begin by making sure that all of the cuts on your metal pieces are square, both laterally and longitudinally. This will play a major role during assembly if they aren’t. Use a file, grinder or belt sander to ensure their squareness.

- Make sure that all of your steel pieces are cut to the correct length. This will make hole location and measuring go much smoother.

- Make sure that your drill press is square, that is that the quill and table are square, otherwise the holes that you drill will not be square. Consult you drill press manual to see how this is checked and adjusted.

- Don’t force the drill bits through the metal. This will cause them to over-heat and they will dull very quickly. Use adequate cooling, either a light water mist or some sort of cutting oil.

- When tapping the required holes, take extra caution to ensure that the tap goes into the hole absolutely square. It is very difficult to line things up later if the holes are tapped crooked.

- Use either a set of dial calipers or a digital version to layout all the holes and cuts, if you don’t, nothing will line up correctly.

- Don’t radius any of the corners, on any of the pieces until AFTER all of the holes have been drilled and tapped and you have assembled the grinder to make sure everything fits right.

- Try to keep tolerances as tight as possible, this will help make a nicer, smoother running grinder when it is complete.

- Be sure to use a center punch to locate all holes to be drilled.
**Knife Grinder Materials List & Construction Tips**

by Michael Clerc

mike.clerc@cox.net

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**Bearing Supports**

**Platen Mounting Plate**

**Platen Mount**

**Platen**

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Page 6 of 7
These holes are drilled ½" deep and tapped ¼-20.

Each piece (2) is ½" x 2" - Cold Roll Steel

Track Ring Pivot Mounts
This area (.750"x2.0") removed.

Both .2010" holes drilled 1/2" into the bottom, are to be tapped 1/4-20.

Hole drilled all the way through the thin leg, drill with 1/16" and tap 5/16-18.

This piece is made from 3/4"x2"x5" cold roll steel.

Tracking & Tension Arm Support

This piece is made from 3/4"x2"x5" cold roll steel.
Grinder Main Arm - Top & Bottom Support

**Top - 3/4" x 2 1/4" x 12" cold roll steel**
- TOP ONLY
- All of the .250" holes are drilled all the way through.
- Holes marked .2010 are drilled with a #7 drill bit and tapped with a 1/4-20 tap.
- All holes are countersunk on the top side to accommodate 1/4-20 flat head bolts.

**Bottom - 3/4" x 2 1/4" x 12" cold roll steel**
- BOTTOM ONLY
- Holes marked .2010 are drilled with a #7 drill bit, and tapped with a 1/4-20 tap.
- All holes are drilled all the way through.
- These two holes are drilled all the way through, but are countersunk from the underside to accommodate 1/4-20 flat head bolts.

Dimensions:
- Top: 4'0" x 4'0" x 1'2.5"
- Bottom: 4'0" x 4'0" x 1'2.5"
Holes marked 0.2010 are drilled with a #7 drill bit, and tapped with a 1/4-20 tap. All holes are drilled all the way through.

Material is 1/4" x 1/4" x 20" cold roll steel.

This hole configuration is for the flat grinding fixture and the work rest.
Holes marked .2010 are drilled with a #7 drill bit, and tapped with a ¼-20 tap. All holes are drilled all the way through.

Material is 1/2" x 1/2" x 20" Cold Roll Steel

Tooling Arm
All holes drilled .20" are tapped ¼-20.

Material is % Cold Roll Steel

Work Rest
Grinder Tension & Tracking Support Arm

This item is ¾” x 2” x 9" - Cold Roll Steel


Bottom View

7.125
0.750
0.375

0.4219

Side View

3.555
4.50
2.50

0.3125
2.0
1.0

0.50
0.0265
0.8-16

Through and tapped

This hole is drilled 3/16".

This hole is drilled 17/64" and countersunk to be used with 3/8" flat head bolts.

These four holes drilled through.

This hole drilled through.
Grinder Main Arm - Support Sides

Both Sides - ⅝" x 1½" x 12"

Cold roll steel

Both sides - ¾" x 1½" x 12"

Hole drilled through ½" steel

Hole drilled through ⅝" steel

Tapped 5/16-18. (1/4" drill) and through a ⅝ steel

All four ½" holes are drilled all the way through, top to bottom, on each piece.

Left side: It is NOT necessary to drill the hole in the hole drilled in the side.
Platen Mount & Platen Plate

Material: Cold Roll Steel

The mounting holes need to be marked, then drilled. The mount is in place and the plate is straight, make sure the plate is centered between the 2 mounting holes. 2.3x4.677 Mild Steel Angle.

These holes can be elongated toward the side to allow for the quicker removal of the work piece.
Holes marked .2010 are drilled with a #7 drill bit, and tapped with a ¼-20 tap. All holes are drilled all the way through.

Tool rest give some variance in location angle to the tool. You can drill several holes in one arc to make the pieces tight. All holes are drilled through a 2/7/14. All holes are drilled with a #7 drill bit and tapped with a ¼-20 tap. Holes marked .2010 are drilled all the way through.

Material is 375, or 500 or 12 x 6 Aluminum Plate

Platen Attachment
Front Support is ¾”x3”x6”, Rear Support is ¾”x5”x6” and both are Cold Roll Steel.

All four of these holes are drilled @ .250” deep and can be countersunk.

All holes drilled in the bottom and top of these supports are drilled ¾” deep, and both are Cold Roll Steel.
The four holes that are drilled .2010" are drilled all the way through, and are tapped @ ¼-20.

All of the holes drilled in the bottom and side of these supports, are drilled @ .2010", are 1" deep, and are tapped @ ¼-20.

Two pieces, ¾"x5"x5", cold roll steel

Grinder - Bearing Mounts (2)
Grinder - Base Plate

Base plate made from ⅛"x12"x20" cold roll steel. (can be made larger if desired to facilitate mounting the motor, this is a minimum)

All holes drilled all the way through, but should be countersunk from the bottom so that plate mounts flat on whatever surface this unit is mounted.
This piece is ¾"x1½"x2" - Cold Roll Steel.

Track/Idler Roller Mount