
2020 FIRST Robotics Competition

Team Element - List of Materials

READ THIS FIRST!

Every year we release wooden versions (or Team Elements) of the field components for teams to build and use when designing their robot and preparing for the season. Below, you will find two separate shopping lists, one for a half field of components, the other for a minimal field.

Half Field List – as its name indicates, this will include all the components to build a half field. This field will closely resemble the official competitions field in both quantities and features of the components.

Minimal Field List – this list will eliminate duplicate items and simplify some designs, if possible. However, it still contains enough components to practice all major aspects of the game with your robot.

Please note: while we make educated guesses on what teams “need” to build, we cannot guarantee that your team will choose to build everything we have included in these two lists. Every team has different needs, resources and abilities. Historically, if a team has not built all the components that we release, it may be financially beneficial to wait until drawings are released to decide how much material to buy. Each drawing will have a separate shopping list on the front page. Additionally, multiple designs will be available at that time. Some will be more convenient for certain teams than others. Again, these lists are our best attempt at helping teams get a head start.

HALF FIELD LIST OF MATERIALS

Plywood and Hardboard Sheets – quality of plywood is up to the user. Please keep in mind that plywood of lower qualities may contain voids and may warp more than high quality plywood. All dimensions listed below are “nominal”.

- 4' x 8' x ½" Thick Plywood – 12 sheets
- 4' x 8' x ¼" Thick Plywood – 1 sheet
- 4' x 8' x ⅛" Thick Hardboard – 1 sheet

Lumber - quality of lumber is up to the user. Please keep in mind that lumber of lower qualities may warp more than high quality lumber. All dimensions below are the “mill cut” dimensions, finished dimensions are smaller. For example, 2" x 4" lumber is really 1½" x 3½”.

- 2" x 2" x 8' – 1 piece
- 2" x 4" x 8' – 53 pieces
- ½" Diameter x 36" Dowel – 1 piece

Hardware and Misc. – Wood screw quantities are approximate and should account for having some spares left over.

- 1½" long, #6 or 8 Wood Screws, 5 lb. box – 2 boxes
- 2½" long, #6 or 8 Wood Screws, 5 lb. box – 1 box
- ¼-20 Tee Nut – 42
- ¼-20 Wing Nuts - 32
- ¼" Flat Washer – 64

- ¼-20 x 1½" Hex Bolt – 48
- ¼-20 x 2½" Pan Head Machine Screw - 16
- ¼ - 20 x 3½" Hex Bolt – 6
- ¼ - 20 x 4½" Hex Bolt – 4
- #10-24 x 1" Pan Head Machine Screws – 8
- #10-24 Nut, Nylock – 8
- 5/16 in. x 2 in. x 3¾ in. Coarse U-Bolt – 4
- 50 lb. x 5" (min. length) Cable Tie – 58
- 120 lb. x 5" (min. length) Cable Tie – 8
- 1¼" Schedule 40 x 10' long, Black Iron Pipe – 2 (one will need to be cut in half)
- 1¼" Black Iron Floor Flange - 2
- 2" Hook Fastener, Adhesive Backed – Approximately 54 feet
- 2" 3M 8830 Scotchlite™ Reflective Material – 7 feet
- 1-11/16" Hole Saw or Forstner Bit
- Tape (duct, electrical or gaffers) – 1 roll

MINIMAL FIELD LIST OF MATERIALS

Plywood and Hardboard Sheets – quality of plywood is up to the user. Please keep in mind that plywood of lower qualities may contain voids and may warp more than high quality plywood. All dimensions listed below are “nominal”.

- 4' x 8' x ½" Thick – 5 sheets
- 4' x 8' x ¼" Thick – 1 sheet

Lumber - quality of lumber is up to the user. Please keep in mind that lumber of lower qualities may warp more than high quality lumber. All dimensions below are the “mill cut” dimensions, finished dimensions are smaller. For example, 2” x 4” lumber is really 1½” x 3½”.

- 2" x 2" x 8' – 1 piece
- 2" x 4" x 8' – 27 pieces
- 4" x 4" x 8' – 2 pieces
- ½" Diameter x 36" Dowel – 1 piece

Hardware and Misc. – Wood screw quantities are approximate and should account for having some spares left over.

- 1½" long, #6 or 8 Wood Screws, 5 lb. box – 1 box or 300 screws
- 2½" long, #6 or 8 Wood Screws, 1 lb. box – 1 box or 150 screws
- ¼-20 Tee Nut – 20
- ¼ - 20 x 3½" Hex Bolt – 8
- ¼ - 20 x 4½" Hex Bolt – 4
- #10-24 x 1" Pan Head Machine Screws – 8
- #10-24 Nut, Nylock – 8
- 120 lb. x 5" (min. length) Cable Tie – 8
- 1¼" Schedule 40 x 10' long, Black Iron Pipe – 1
- 1¼" Black Iron Elbow, 90 deg - 1
- 2" Hook Fastener, Adhesive Backed – Approximately 34 feet
- 2" 3M 8830 Scotchlite™ Reflective Material – 7 feet
- 1-11/16" Hole Saw or Forstner Bit