RADIUS TRACK
TRACK AND STUD BENDER
USER'S MANUAL

CHAPTER 1 INTRODUCTION

RADIUS TRACK CORPORATION; TRACK AND STUD BENDER is the solution for field fabrication of curved wall and curved ceiling components, such as arches and barrel vaults. The bender is a portable, easy to use heavy-duty device that accurately produces compound indentations in 20 and 25 gauge steel studs and track. These indentations, which are created at regular intervals along the length of the material, impart a curve into the stud or track. The indents can be spaced from as close as 2 inches, up to 12 inches on center, depending on the desired radius to be created. Any installer capable of curved wall construction with traditional methods will quickly learn to use the Track Bender.

NO PLYWOOD OR STRAPPING NEEDED.

The Track Bender produces a curved member that is complete and ready for use in minutes. No additional reinforcement is necessary. No additional steel is needed to maintain the required curvature, which translates into significant labor savings. The completed pieces can be used immediately, or stored for use later in the project.

MAINTAINS STRENGTH.

The unique method of creating these indentations in the studs or track actually increases the rigidity of the members. Once a piece of track is bent into a radius, it is capable of spanning distances in excess of 5 feet between supports, which significantly shortens the installation time required for each wall or ceiling section.

EASE OF ADJUSTMENT.

The Bender has an infinitely variable control mechanism, which, in combination with the architectural plans, allows the user to quickly set the machine to produce the required curve. Once set, the tool will bend the tracks or studs to the same radius piece after piece, all day long. Just as quickly, the user *can change the radius at any time* with the turn of a dial, to produce a single length of track or stud with several curves!

TOP TO BOTTOM WALL COORDINATION.

Due to the precise spacing of the indentations, track sections should be vertically matched. The installer should lay out both top and bottom tracks by aligning the indentations of both pieces. The indentations in the top track will then be plumb with the indentations in the bottom track. Studs installed next to the indentations will be plumb and appropriately spaced. This useful time saving procedure will eliminate the need to plumb each stud!

Track Bender models S150 and D150 will curve 20 and 25-gauge material. The S150 Track Bender comes with the accessory kits needed to make curves in 2-1/2", 3-5/8", and 6" material. The S150 will accept stud and track members with a maximum leg depth of 1-7/8 inches. The D150 includes accessory kits to make a curve out of any 2-1/2", 3-5/8" and 6" material and will accept a maximum leg depth of 3 inches.

Please send your comments and inquires to:

Radius Track Corporation

info@radiustrack.com
www.radiustrack.com
Phone: 763.795.8885
Fax: 763.795.8884

CHAPTER 2 SETTING UP THE BENDER

CHECK TO SEE THAT YOU HAVE THE FOLLOWING ITEMS:

S150 or D150 Track Bender
Two Piece Handle
Radius Gauge
Instruction Manual
Degree Settings Charts (2) double sided charts
Allen Wrenches, 4mm, 5mm, & 6mm
Kits for other track sizes, including blades and block adapters

SECURE THE BENDER.

You will need to set up the bender on a suitable table, low scaffolding, or sawhorses and planks. Secure the bender to the table with bolts, screws, or suitable C-clamps. Because of the lever motion of the handle, the bender WILL NOT WORK PROPERLY without being secured to AN APPROPRIATE BASE! Screw the two handle sections together and insert the handle into the hole provided in the main shaft. The unit is now ready for the next step.

DAILY CARE OF THE BENDER.

All moving parts of the bender should be oiled generously several times a day during heavy usage, and at the end of the day to prevent any rusting. We recommend 3 in 1, or any light lubricating oil. WD40 should be used occasionally to wash all moving parts that are subject to dust and grit, which may affect the smooth operation of the tool.

CHAPTER 3 THE IMPORTANT PARTS

The bender uses two main parts to bend track or studs. The **ADJUSTMENT/ MARKER ASSEMBLY**, located on the round main shaft, sets the amount of the indentations made by the **DIE ASSEMBLY**, located under the handle. The marker assembly also marks the proper distances for the indentations.

CHANGING THE SPACING.

The **ADJUSTABLE MARKER** is clamped to the marker rail with two Allen head cap screws. Remove these screws and slide the marker holder up or down the rail to change the setting in 2-inch increments from 4 inches to 12 inches on center. Select the spacing based on the size of the curve you need to build. The spacing should be close enough to avoid "flat sports" becoming visible. 4 or 6 inch spacing work well for curves under 20-foot radius. Larger spacing can be used for larger curves. A small insert blade on the bottom of the marker holder places a cut or mark on the track, When advancing the material, align this mark with the left side of the "v" shaped guide for the top indenting blade. Spacings of 2 inches are accomplished by bolting the marker holder at the 4-inch position. Pull the handle to make the first indentation. Advance the track 2 inches, instead of 4 inches. Thereafter, the marks will be spaced at 2-inch spacings for the rest of the piece. Similarly, bolting the marker holder at the 6-inch position and advancing only 3 inches for the second bend will create a 3-inch spacing pattern.

CHANGING THE DEGREE SETTINGS.

The bender uses basic Geometry to create curves in track or studs. The **radius** of a circle is the distance from the center to the edge of the circle. The **diameter** is the distance across the circle, which is also twice the radius, and the **circumference** is the distance around the edge of the circle. The **circumference** of every *circle* was long ago divided into **360 equal parts**, each called a **degree**. For example, if you walk ten paces forward, then turn left 1 degree, then ten paces, then left 1 degree, and so on, you will arrive back where you started after 3600 paces. If instead you turn left 10 degrees each time instead of one, you get back to the starting point in only 360 paces! By changing the **amount** of each turn you can **change the size of the circle you make.** If you turn 90 degrees each time, you will get back in 40 paces, but you will <u>also</u> be making a **square**, and the flat spots will be <u>very</u> visible! You don't need a bender to make a square, but the same principle applies!

The **ADJUSTMENT ASSEMBLY** is used to set the amount of indentations made in the track by the **DIES**. The indentations can vary between 0 and 8 degrees, depending on the width of the track or stud. The setting of the tool is indicated by the position of the acrylic indicator over the graduated scales on the top front of the assembly. A plastic knob in the elongated adjustment slot holds the acrylic indicator. This slot allows the tab's position to be changed to account for variations in the metal quality and gauge of the stud or track you are bending. Position the indicator so that it is centered on this slot, which will allow equal up and down adjustment, or **CALIBRATING**, which will be covered in Chapter 4.

TO CHANGE THE DEGREE SETTING.

1. Loosen the **HUB CLAMPING KNOB** located to the left of the adjustment knob.

2. Turn the **ADJUSTMENT KNOB** located at the top of the assembly. Turn the knob right or left to the desired degree setting.

3. Tighten the **HUB CLAMPING KNOB** to prevent any movement of the **ADJUSTMENT KNOB** during use.

DO NOT OVER TIGHTEN THE HUB CLAMPING KNOB! A good, snug clamping is all that is needed! This adjustment is basically the only thing you have to do to this machine, so don't let untrained workers near this machine without proper training and supervision. The forces generated by the handles and levers of the bender are very high, and improper use may result in damage to the machine and/or injury to the worker.

CHAPTER 4 CALIBRATION

Calibrating the bender is necessary because not all steel track and studs are the same. Some track is made from new steel, some from recycled city buses. Studs can be zinc plated or have a painted finish. These variations often result in slightly different bends when different materials are used or when materials are changed. These variations are corrected during calibration, which should be performed *each time a new radius is required* or *whenever materials are changed*.

1. Set the **ADJUSTABLE MARKER** spacing at the selected position for your bending job. See the instruction above if needed.

2. Adjust the **DEGREE SETTING** to the required setting for your bending job. See the instruction above if needed. Remember to use the degree scale that applies to the width of the track or stud you are bending.

3. Select a uniform piece of your job material for testing. Use a piece of track (or stud) at least six feet in length. Check that the flanges are straight and perpendicular to the web. Place the track on the table with the flanges facing down.

4. Using a framing square (or the right end of the radius gauge), make a line across track about **6** inches from the right end of the track.

5. Place the track on the bender bed, aligning the 6 inch cross line with the center of the indenting blades. Make a bend by pulling the handle down and towards you and down in a smooth, continuous motion. Stop when you hear a "click" sound from the "torque indicator". No additional force or pressure is needed after you hear the "click". You have now placed a degree bend in the track.

6. Remove the track from the bender and place it on the table, flanges down. Hold the right sides (short end) of the RADIUS GAUGE tight against the 6-inch track section, while aligning the hourglass openings with the 6-inch cross line on the track. The left side (long end) of the **RADIUS GAUGE** will rotate away from the track. Read the scale on the left edge of the gauge. The point on the scale at the front edge of the track is the *actual degree of bend* for this indentation. If you are reading a number other than the degree you want for this bend, the material was probably a slightly different gauge, or it had heavier zinc plating.

7. Loosen the thumbscrew of the clear plastic tab and move the tab so that it lines up with the degree you measured in your first bend. Turn the **ADJUSTMENT KNOB** located at the top of the assembly, changing the setting of the bender to the *required degree setting* for your bending job.

8. Repeat the test bending steps **4, 5 & 6** above by advancing the track at least 6 inches between test bends, allowing enough material for the **RADIUS GAUGE** to work. Bend and measure the degree of this next bend. The degree measured should match your required degree. If the setting does not match, repeat step **7 & 8.**

9. Once the bender is "tuned in" to the correct setting for your metal, and you are reading the correct degrees on the **RADIUS GAUGE**, you are ready to bend a complete piece.

The bender is now calibrated to the particular bending job you require. With a little practice, the above calibration procedure should take about 5 minutes to complete. You can *avoid additional calibrations* by ordering the entire track or studs you intend to bend at one time. This increases the chances that the material is from the same lot.

CHAPTER 5 BENDING TRACK AND STUDS

If you followed the calibration procedure correctly, the bender is now ready to go. All you need are the adjustment settings for your bending job. These settings come directly from the **DEGREE SETTINGS CHART**. To use the charts do the following:

1. From the Architectural plans or details, determine the required radius needed for your project. The radius gauge measures the **outside radius**, which is the curve of the track outside, or larger, than the inside radius. Remember to add or subtract the width of your track or stud to the radius down on the plans in order to determine the outside radius you require. Each architect may have a different way of showing or arriving at the curves they want. As is usually the case, it is up to you to determine from the drawings which measurement you need to use. If the track you bend ends up on the wrong side of your layout line, you did it wrong.

2. Find the outside radius you need in the numbers along the bottom of the chart.

3. From that point go straight up the chart to the point it crosses the curved line for the marker spacing you are using. If the marker is set at 10 inches on center, don't use the 4-inch line. It won't work!

4. From the point on the curved line, read across to the left side of the chart. The degree value shown is the amount of degrees of bend you will require for your bending job.

Now that you have the degree settings you need, simply turn the adjustment knob to the required setting. Until you have some experience with the bender we suggest that you test the first bend on each piece of track in the same manner as the calibration procedure from Chapter 4. It only takes a few seconds, and you will have a chance again to adjust the bender to give you the exact degrees your curve requires. it is also useful to have a layout on the jobsite of all the curves you need to make, allowing you to quickly compare your final product with what is needed. This is also suggested for any pieces which have to be made to very close tolerances, such as plus or minus 1/4" of curvature in 10 feet of track.

ADVANCED FEATURES AND IDEAS

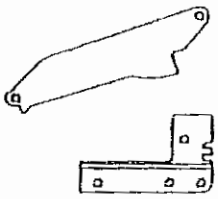
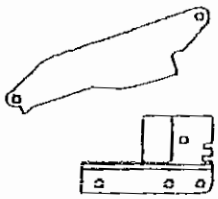
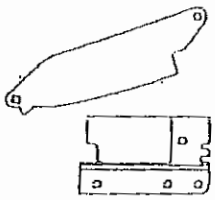
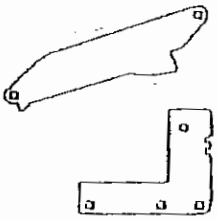
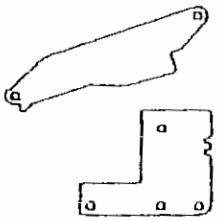
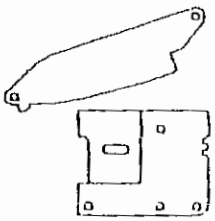
Track should be coordinated so that the top and bottom track both begins and ends at the same point. If you slit the top track for joining, you should do the same to the bottom track.

FIELD ADJUSTMENT OF CURVED TRACK

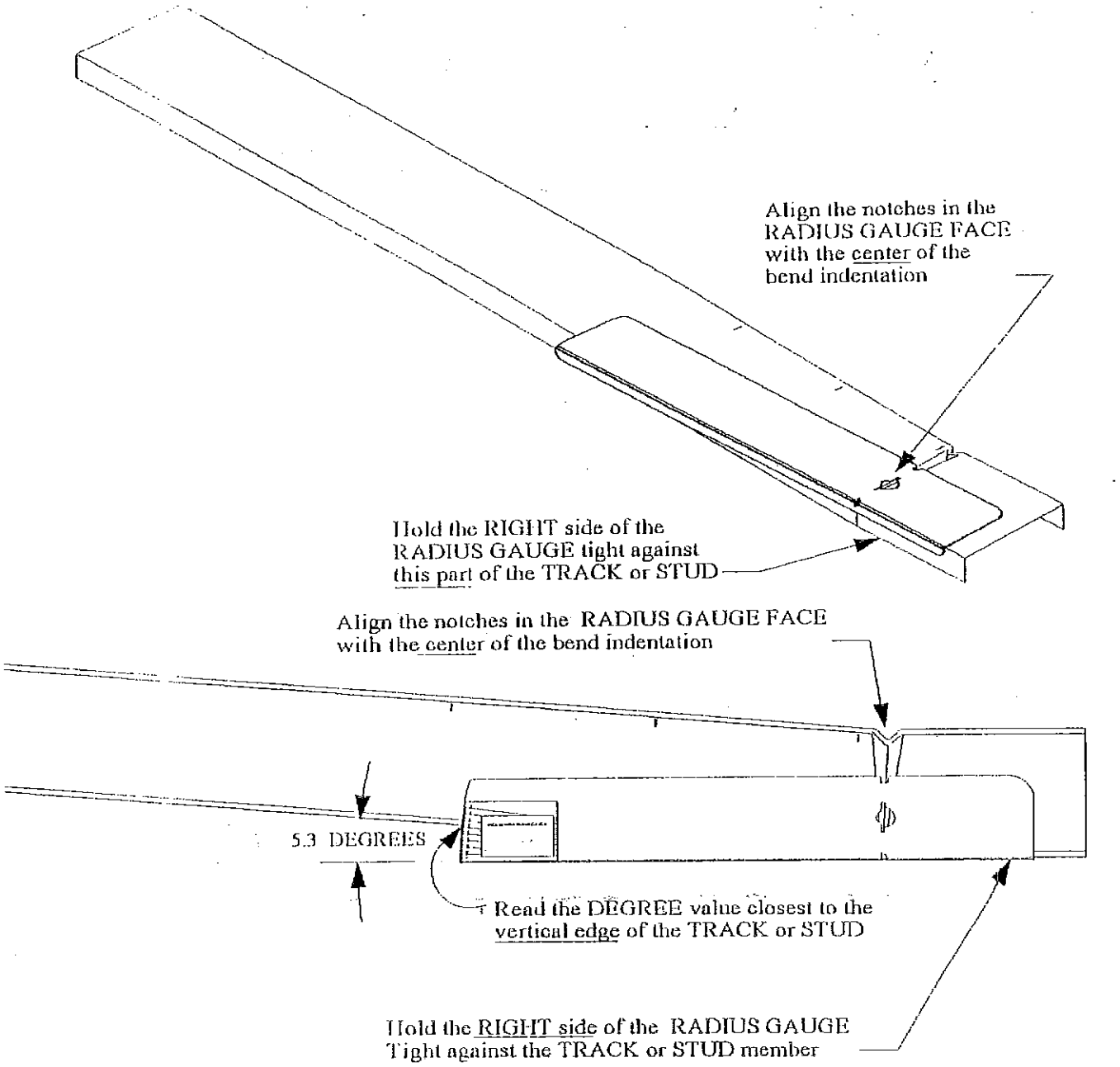
If there is doubt about the size of the curve you are trying to achieve, make the track a smaller radius rather than larger. It is very easy to adjust the curvature of the track or stud by gently tapping down on the ridge formed by the dies. I say gently because all it takes is a gentle tap on each ridge for the track to start to "walk" out to a larger curve. You can even make it back into a straight track with little effort. It is very difficult, if not impossible, to make a larger curve smaller. After making a mistake on a piece of material, save it, it may be useful later as a transition piece or other application. This tapping procedure is also useful when you need to adjust a transition to a straight wall.

END OF INSTRUCTIONS

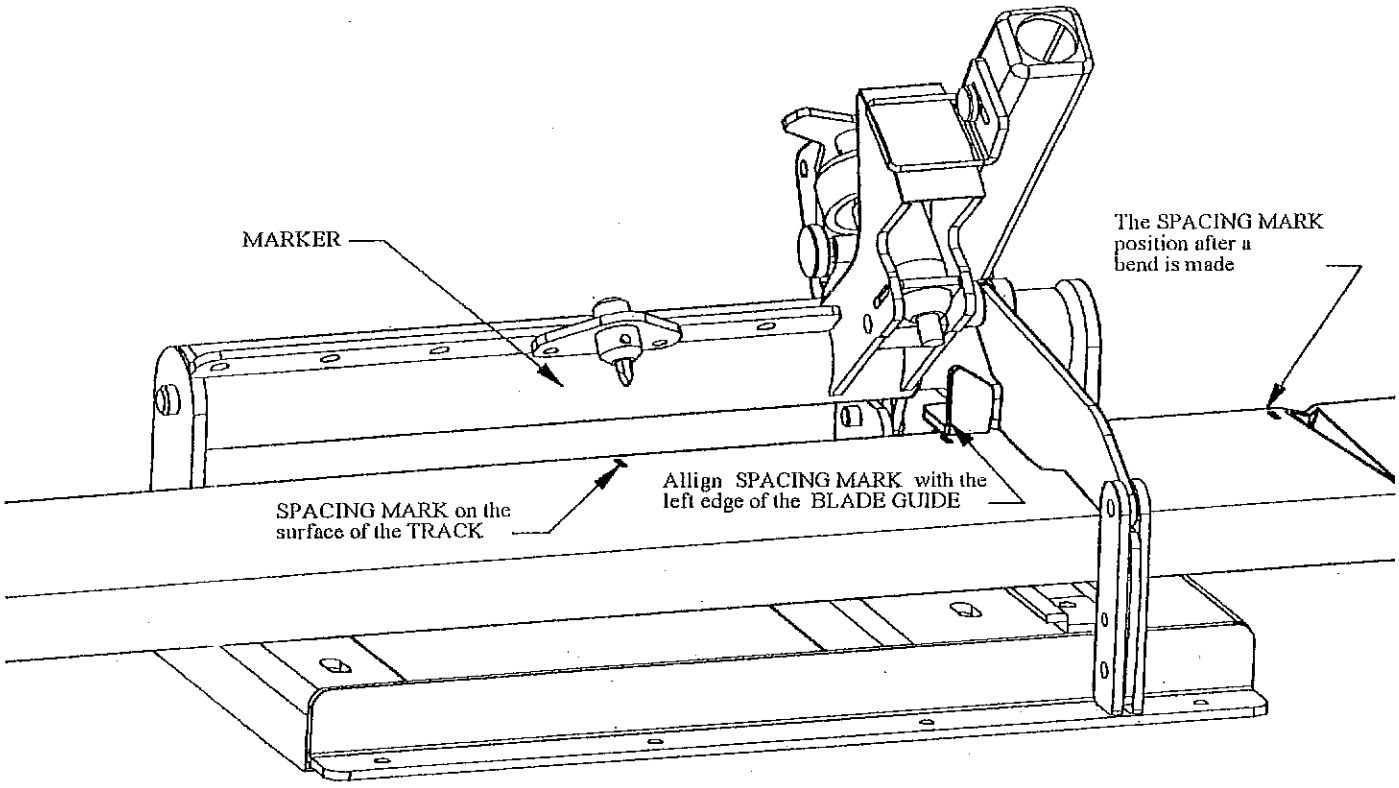
Blade and Block Configurations

	PROFILES 2-1/2" (65 mm)	3-5/8" (92mm) 4" (100mm)	5-1/2" (140 mm) 6" (150mm)
MODEL # S150			
MODEL # D150			

Using The
RADIUS GAUGE



Placement Of The Spacing Mark



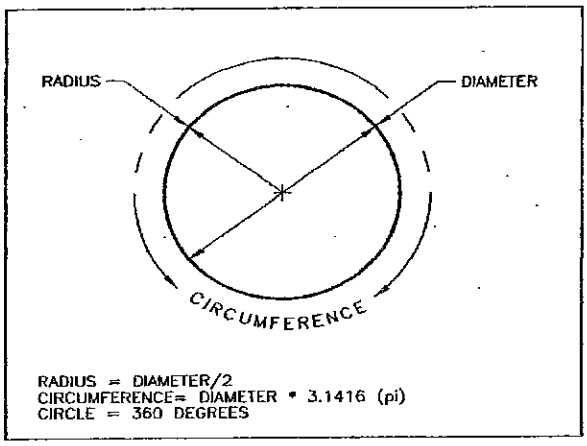


Fig. 11

11 Useful Formulas and Definitions

Degree Setting:

$$\frac{\text{Desired spacing x } 57.296}{\text{Radius of Circle (inches)}} = \text{Degrees}$$

Circumference of a Circle:

Diameter x 3.1416 (Pi or π)

12 Method of Calculating Points on an Arc Off a Straight Line.

At some point in time, you may be required to bend a curve that is too large to realistically swing an arc to check your radius. The following method will allow you to layout points on the arc by measuring off of a straight line drawn on the floor.

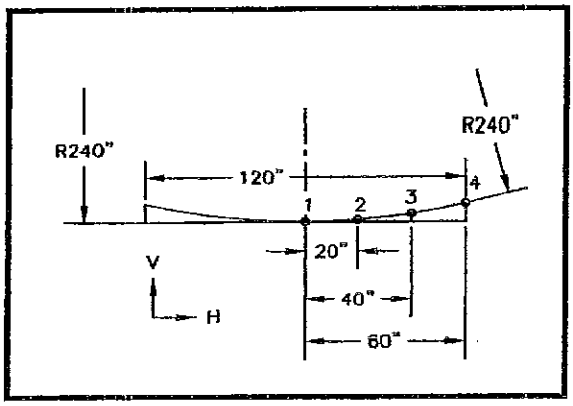


Fig. 12

You will need a calculator with a square (x^2) and a square root ($\sqrt{}$) key.
Begin by constructing a straight line at least as long as the length of your material. Place a mark at the midpoint of the line. This is point 1. To calculate the points on the arc, we will use the following formulas:

$\mathbf{R^2 - H^2 = L^2}$ and $\mathbf{R-\sqrt{L^2}=V}$ where

R=Radius of the arc in inches
H=Horizontal Distance between layout points
L=Length of the third side of the triangle
V=Vertical departure from the layout line

Refer to figure 12. To calculate height at point 2, we will use 240" for the radius **R** and 20" for the horizontal spacing **H**. By substituting these values for **R** and **H** in the first formula we have:

$\mathbf{240^2 - 20^2 = L^2}$ or **57600 - 400 = 57200.**

Applying this number to the second formula,

$\mathbf{240-\sqrt{57200} = V}$ or **240 - 239.17 = .83"**

Since we are measuring up from the bottom of the arc, we need to subtract the number **L** from the original radius. Point #2 in figure 12 will be placed at H = 20" and V = .83" (approx. 13/16"). . Repeating these calculations substituting the remaining values for H would give us points at the following locations:

Point 1: H = 0.00" V = 0.00"
Point 2: H = 20.0" V = .83"
Point 3: H = 40.0" V = 3.36"
Point 4: H = 60.0" V = 7.62"

Note that the **V** Values are be the same on the other side of centerline.

Connecting these points will give you the required arc. The more points you use, the more accurate the arc.

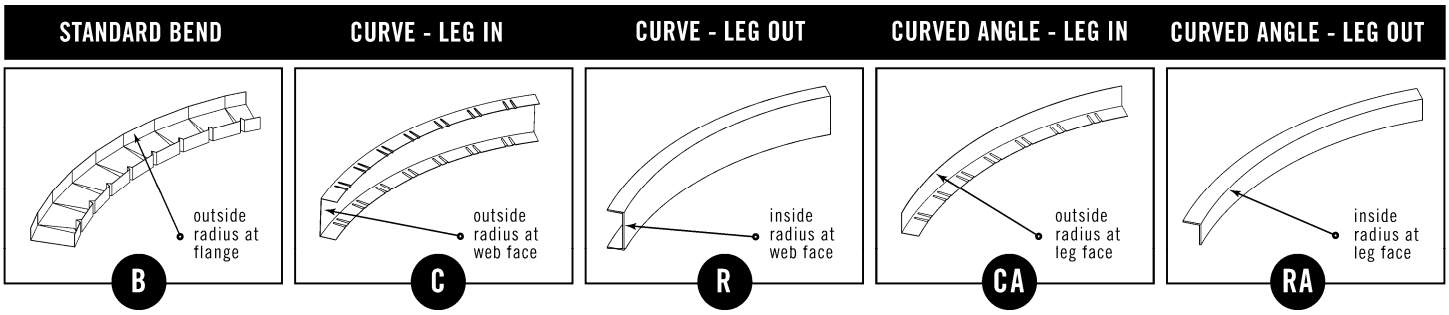
13 About Radius Track Corporation

The Radius Track Corporation is a privately owned company with manufacturing facilities in Minneapolis, Minnesota. In addition to the **Trim Bender**, we also manufacture and sell the **Track Bender**, a portable bending tool engi-

www.radiustrack.com
info@radiustrack.com
Phone: 763.795.8885 | Fax: 763.795.8884

REQUEST FOR QUOTATION: RADIUS TRACK™ CUSTOM CURVING

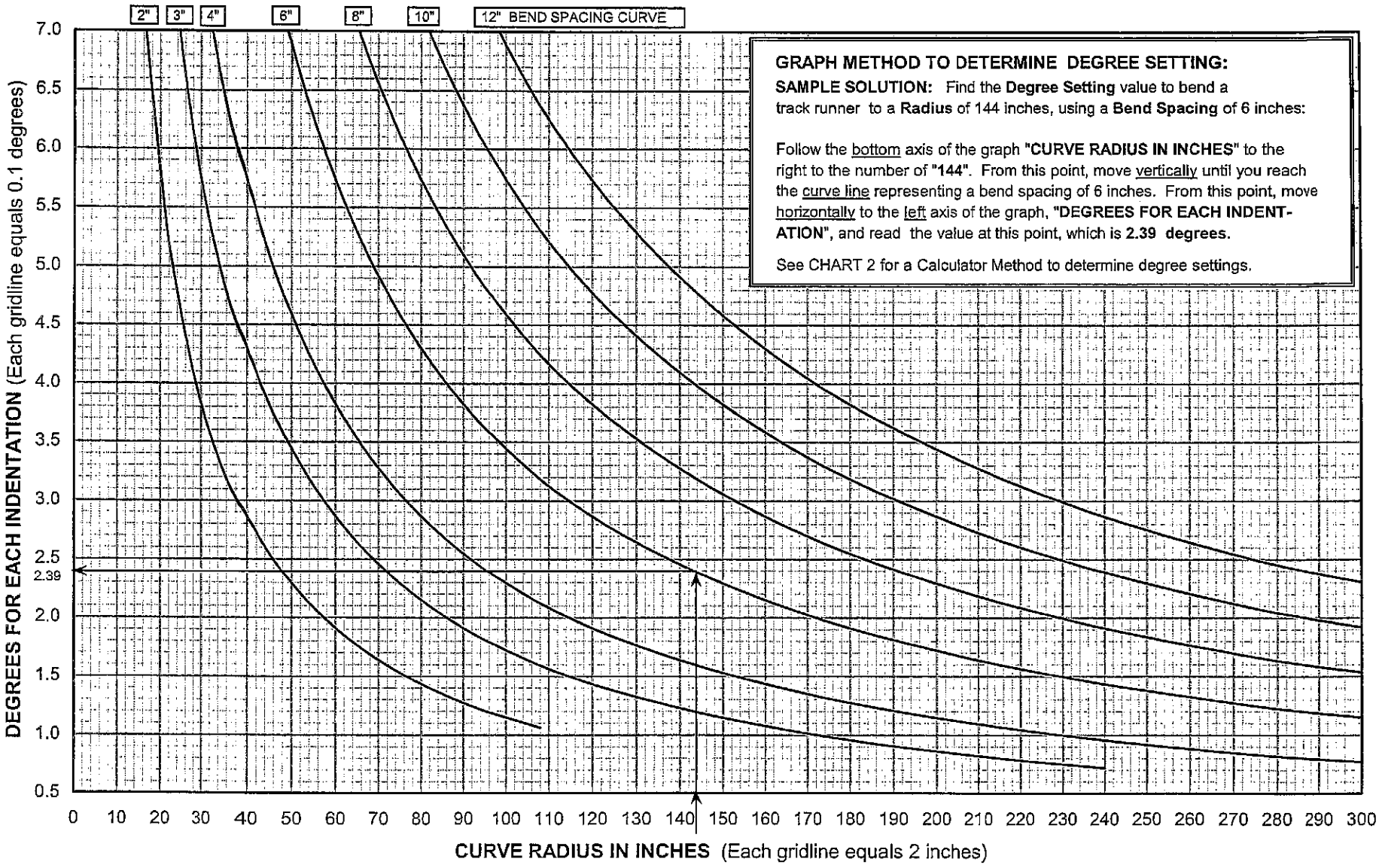
COMPANY NAME:	**SHIP TO:**
CONTACT:	**PROJECT NAME:**
ADDRESS:	**ADDRESS:**
CITY, STATE, ZIP:	**CITY, STATE, ZIP:**
PHONE:	**PHONE:**
FAX:	**FIELD CONTACT:**



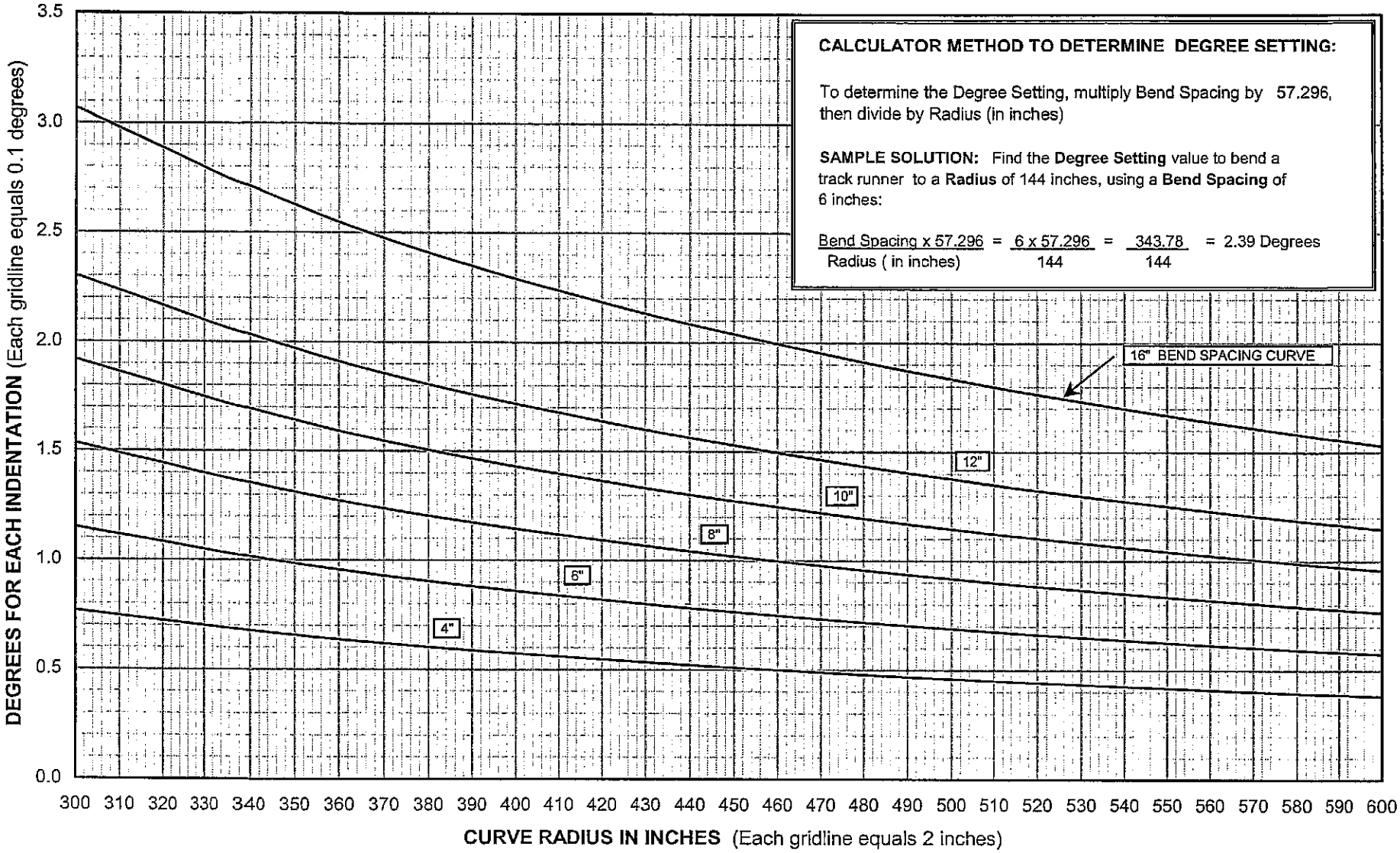
	CURVE TYPE (B, C*, CA, R*, RA) *TRACK ONLY	**QUANTITY** (# OF PCS)	**ARC LENGTH OF MATERIAL** (UP TO 35')	**MATERIAL TYPE** (E.G. TRACK, STUD, ANGLE, ETC.)	**WEB WIDTH** (UP TO 12")	**FLANGE** (UP TO 3")	**GAUGE** (20, 18, 16, 14)	**RADIUS** FEET	**RADIUS** INCHES
1									
2									
3									
4									
5									
6									
7									
8									
9									
10									
11									
12									
13									

NOTE: You may have to add or subtract the wall and/or finish thicknesses to determine the correct radius for your job.

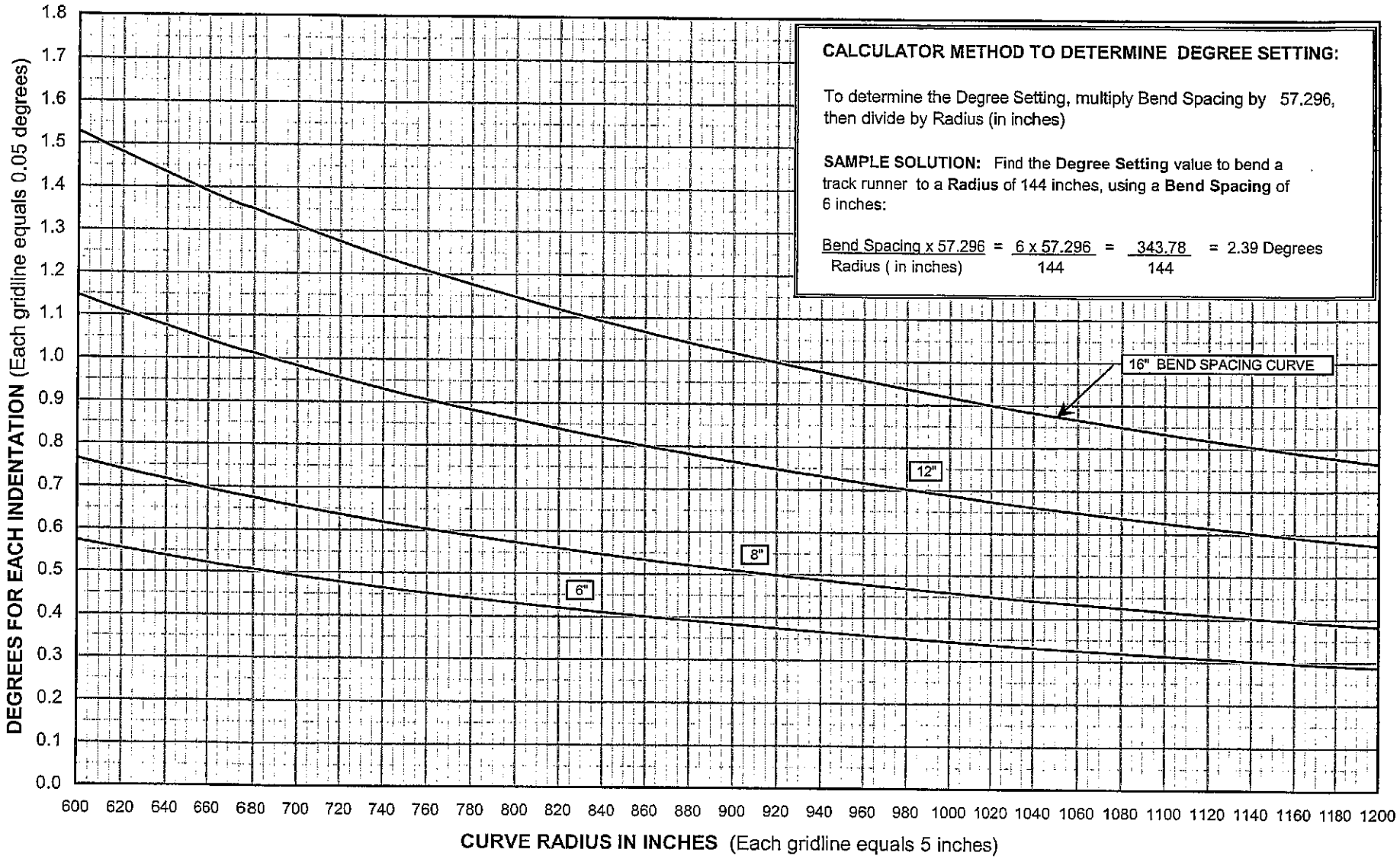
DEGREE SETTINGS CHART 1 - FOR 15 INCH TO 300 INCH RADIUS



DEGREE SETTINGS CHART 2 - FOR 300 INCH TO 600 INCH RADIUS



DEGREE SETTINGS CHART 3 - FOR 600 INCH TO 1200 INCH RADIUS



DEGREE SETTINGS CHART 4 - FOR 1200 INCH TO 1800 INCH RADIUS