



# HO Structure Kit

## 90' NON-MOTORIZED TURNTABLE

### 933-3171

Thanks for purchasing this Cornerstone Series® kit. **NOTE: This is an unpowered kit! You must buy Motorizing Kit 933-1050 separately to power this turntable. Decide before assembly whether you will power it or not.** All parts are made of styrene plastic, so use only paints and glues which are compatible. Before starting, please read through these instructions and study the drawings.

Although we associate turntables with steam locos, they are still part of today's engine terminals. Requiring less space than a wye, they are an economical and functional way to reverse locos or cars. A turntable is basically a large bridge, equipped with rails, and designed to revolve in a full circle. Around the turntable, a series of radial tracks (other nicknames were also used) run into roundhouse stalls, open-air storage or service tracks. So that all rails were at the same height, the turntable was constructed in a large circular opening, called a pit. Early pits were made of earth or stone, while modern designs used concrete.

The basic concept of the turntable evolved before the railroad, when crude examples were used to reverse coal carts in mines. From the earliest days, steam locos (as well as some equipment such as spreaders, snowplows and observation cars) were built to operate in one direction and had to be turned around for their return trip. By 1842 a device we would recognize as a railroad turntable was in regular use in England. Over the next century the turntable became a fixture of railroading around the world.

In America, three basic types developed. The first was the center-balance with a central pivot point and wheels under each end of the bridge to support the weight. Bigger and heavier locos put too much strain on these turntables. The next style was the Articulated Design, with a central vertical hinge, which allowed the table to tip in the direction of the greatest weight. The final type, still seen today, was the Continuous Girder which supports the weight on the center pivot and on load-bearing wheels under each end.

Two styles of turntable bridges became common. These included the Deck Style, with most of the bridge below ground level (requiring a deep pit) and the Through Type, where a portion of the bridge was above ground.

In order to swing the table end for end, a source of power was needed. In the early days, they were pushed by men with strong arms, and these tables were called "armstrongs." In later years, steam and gasoline engines were used to drive one set of the load-bearing wheels, but electric motors were found to be the best choice for most applications. Electricity could be supplied using underground cables, but most tables had an arch over the center, connected to overhead power lines.

In most terminals, the turntable and roundhouse were in constant use. For easier and safer operation, turntables had a small

operator's cabin at one end of the bridge. This housed controls and placed the operator in the best position to align the rails. Many also sported an old engine bell, which was rung to warn that the table was being turned.

New turntables were usually built to accommodate the longest engines in service on a division. For this reason, some large engines were restricted to one or two divisions where turntables and facilities were big enough for them. Railroads also went to extremes to utilize existing turntables. Some ordered new steam locos with short wheelbases so they would fit, others extended turntable rails, some resorted to jacking up the end of the tender!

With the coming of diesels, the need for turntables began to decline. Although F units still had to be turned, the new road-switchers and Geeps could be run in either direction. Today, the number of turntables on active duty is declining, but those still in use can be found at major shops and engine terminals. A few are also in use at railroad museums.

#### ON YOUR LAYOUT

Sized to fit an average layout, this 90' table is typical of the units installed by most roads. It will easily accommodate a 2-8-2 or 4-6-2, which was the big power on most lines. Diesels up to 12-3/8" long fit easily on the table, so it can be used in any era.

Virtually all turntables were used in conjunction with a Roundhouse (933-3041). This basic kit builds a three-stall structure, but its modular design makes it easy to enlarge, up to a full-circle, by combining kits. The interior has been carefully sized to hold engines up to 13" long.

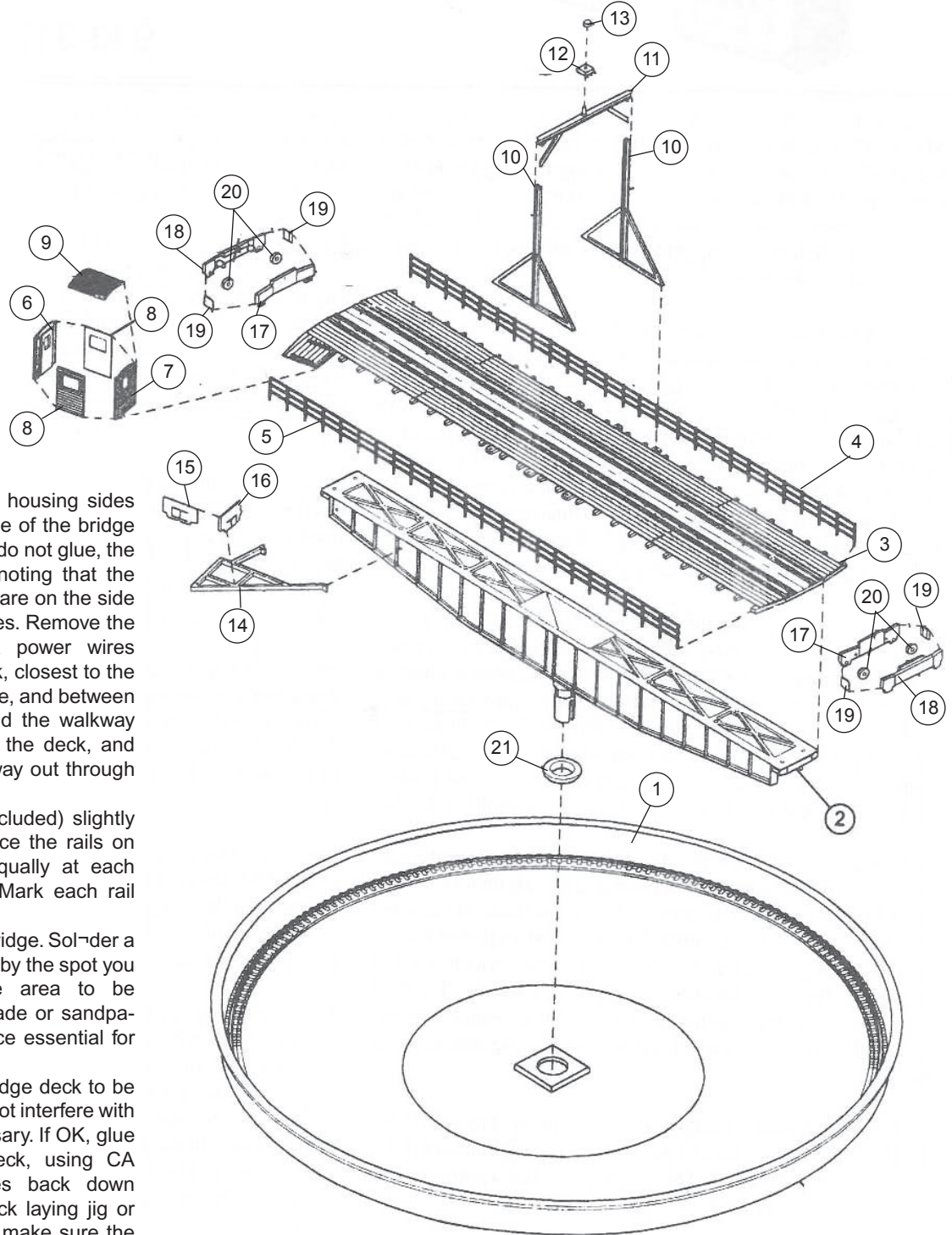
Most roundhouse and turntable combinations were built at division point terminals where engines were changed and serviced. Other facilities such as a Coaling Tower (933-3042), Water Tank (933-3043), ash pit and sanding tower were also located near the turntable to speed the turn-around time for each engine. In many metropolitan areas, the terminal was part of the railroad's shop complex. The Turntable is a perfect complement to a shop scene, constructed with the Backshop (933-3039) and Car Shop (933-3040).

Your dealer can supply a variety of locos, figures and vehicles for your favorite era, as well as kits to build the many different storage and service buildings found near a roundhouse.

For additional prototype history and information on turntables, see "The Locomotive Merry-Go-Round" by James Alexander Jr. in the July, 1995 issue of "Trains" magazine. Your local library may also have copies of older Railroad Maintenance Cyclopedias, which provided basic information on turntables and other facilities.



1. Place the upper bearing (21) into the pit (!). Use a small amount of CA type cement to hold it in place.
2. Place the lower bearing (22) into the recess of the mechanism cover (29) [See illustration on next page].
3. Assemble the bogie halves (17 and 18) together, with the wheels (20) sandwiched in between and turning freely in the cone-shaped bearing surfaces. Glue on the end pieces (19). Glue the bogie assemblies into the pockets at the ends of the bridge (2).
4. Place the bridge (2) upside down on your work surface and set the pit (1) upside down on top of it, with the bridge shaft going through the hole in the pit.



5. Glue the (simulated) motor housing sides (15 and 16) to the underside of the bridge deck (3). Then position, but do not glue, the deck onto the bridge (2), noting that the long ties for the control cab are on the side of the bridge that has 2 holes. Remove the deck and feed the track power wires between the ties of the deck, closest to the center of the deck lengthwise, and between the inner guard timbers and the walkway boards. Glue the bridge to the deck, and then pull the wires all the way out through the deck.
6. Cut 2 pieces of rail (not included) slightly longer than the bridge. Place the rails on the bridge, overhanging equally at each end, but do not glue yet. Mark each rail where it is closest to a wire.
7. Remove the rails from the bridge. Solder a wire to the bottom of the rail by the spot you marked. Hint: scrape the area to be soldered with an X-Acto blade or sandpaper to obtain a clean surface essential for soldering.
8. Test fit the rails onto the bridge deck to be sure the soldered joints do not interfere with wheel flanges. File if necessary. If OK, glue the rails to the bridge deck, using CA cement, feeding the wires back down through the ties. Use a track laying jig or NMRA standards gauge to make sure the rails are properly spaced. After the glue dries, trim the rails to the length of the bridge with a flush cutter or cutoff disc in a motor tool. Filing a slight bevel on the ends of the rail heads will help guide a loco's wheel flanges when coming onto the turntable.
9. Assemble the cab (6, 7, 8, 9) together and to the deck as shown in the illustration. The cab doorway faces the end of the deck.
10. Assemble the power arch (10 and 11). Slip the power collector (12) onto the pin in the center, but do not glue. Place the retainer (13) on top and glue it carefully so that the power collector is free to rotate. For added detail, dummy wires can be glued to the "insulators" and run to a power pole near the edge of the pit.
11. Glue the handrails (4 and 5) to the deck, with the lengthwise railings facing inside. The bottoms of the posts should be even with the bottoms of the long ties. The posts glue to the sides of the long ties where they protrude from under the walkway boards.
12. Glue the (simulated) turntable drive support (14) into the holes in the bridge side and onto the motor housing sides (15 and 16). The notches in 15 and 16 should fit over the braces of part 14.

13. Place the metal washer (50) onto the shaft with the surface that has the rounded edges against the pit. Remove the big gear (33) from the sprue and place it onto the shaft as far as it will go on top of the washer. The "nubs" from the sprue should be down that is, next to the pit bottom. Use CA type cement to secure the big gear to the shaft.
14. Cut 2 pieces of wire about 5" long. Strip about 1/4" of insulation from each end. Solder the free end of one of the wires to the inner surface of the brass tube (35). Repeat with other wire and tube. Slip one of the tubes onto the bridge shaft, feeding the wire into the slot and through the shaft. Glue the plastic spacer ring (28) onto the shaft. Repeat with the second brass tube. A small amount of Goo on the shaft before placing the second brass tube will help keep it in place.
15. To install Motorizing Kit, 933-1050, (Sold separately) continue reading. Skip to step 16 if not using the Motorizing Kit. Use two of the provided self-tapping screws, mount the motor/gearbox (30) to the bottom of the mechanism cover (29).
16. Using the machine screws (37), attach the electrical wipers (36) to piece 26. Do not tighten the nuts (38) yet. Temporarily place the piece 26 into position to see how much the wipers must be bent to make good contact with the brass tubes (35).
17. Cut the remaining wire into 2 pieces and strip the insulation from each end. Bend one end of each wire into a hook. Loosen the nuts (38) and slip a wire under each, and then tighten. Be careful that the wipers do not touch each other. Wrapping some tape around one of the wipers will maintain the necessary gap.
18. Use a marker or some other means to distinguish the motor wires from the track power wires. Fasten the mechanism cover (29) onto the pit bottom with the 4 self tapping screws. Make sure that the tab on piece 26 is guided into the slot in part 29. The wire should emerge from the gap near motor gearbox.

Make sure the rounded edges go up towards the bottom of the pits.

19. When you have determined the location of the turntable, mark a circle 12 5/8" in diameter. All tracks coming from the turntable should be in line with the center of the circle, so it is best to mark their centerlines before cutting the hole. Cut the hole with a saber saw and test fit the pit. Use a wood rasp or file to finish the opening if it is too tight.
20. Connect the wires to appropriate power source. The track power feeders should be routed through a reversing switch independently from the approach track(s). The motor drive power should be controlled through a center-off type reversing switch. Since the motor operated more realistically at less than its full 12 volts DC, an inexpensive power pack can supply power, speed and directional control for the motor.

933-1050 Motor/Gearbox  
(Available Separately)

#### DECALING

1. After cutting out the decal, dip in water for 10 seconds, remove and let stand for 1 minute. Slide decal onto surface, position and then blot off any excess water.
2. Lightly brush Micro Sol® on top. This will soften the decal allowing it to conform to irregular surfaces. DO NOT TOUCH DECAL while wet!
3. When the decal is thoroughly dry, check for any trapped air bubbles. Prick them with the point of a small pin or hobby knife blade and apply more Micro Sol®.

