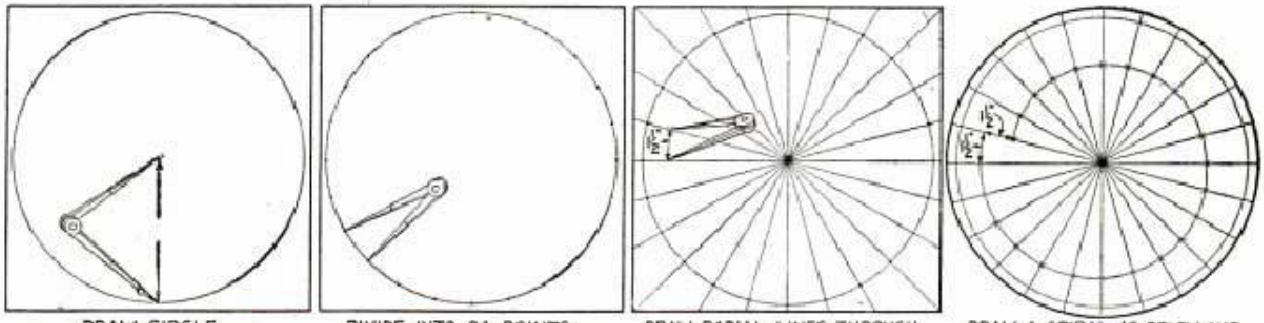



# Making a Television Disk

## *If You Are Looking for New Thrills, This Article Will Help You to Start Delving into Radio's Latest Marvel*

By JOHN CARR

A SOLEMN faced young man in his 'teens gazed gravely at a shiny red motorcycle. The time had come for a momentous decision. Should the fascinating speed machine be sacrificed on the altar of science? Were the experiments he was making in the budding science of wireless worth the sacrifice? Science won. The motorcycle was sold and the money went into more apparatus.

This all happened in 1910, and the young man who made the decision was Edwin H. Armstrong, who years later won fame and fortune with his invention of the regenerative circuit and the superheterodyne.

Countless other young men who got into radio in its infancy have won high places in various branches of the vast industry.

Television, the newest scientific infant, may be equally good to those who begin delving in its unsolved problems today.

In the September issue of POPULAR SCIENCE MONTHLY, the problems confronting the television experimenter were outlined. This article will show you exactly how to make the television scanning disk. A succeeding article will show you how to assemble the rest of the apparatus and receive "visions," as they are being called.

The television scanning disk is simply a circular sheet of thin metal with a spiral of small holes drilled in it. This disk rotates in front of a neon lamp.

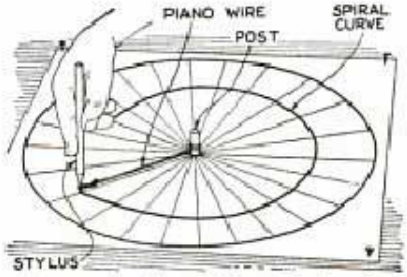
The holes in the spiral are so spaced that for each revolution of the disk the holes in succession sweep across every portion of the picture area represented by the plate of the neon tube. First the hole farthest from the center of the disk sweeps across the top edge of the picture. As this hole passes beyond the edge of the area, the second hole starts to sweep a path just inside the path of the first hole, and so on.

The number of holes in the receiving disk must be the same as in the transmitting scanning disk at the broadcasting station.

At present experimental television transmission is being carried on with disks having twenty-four, thirty-six, or forty-eight holes.

The size of the scanning disk is determined by the size of the plate in the neon tube and the number of holes in the spiral. With a neon tube having a plate one and a half inches square, the maximum picture it will illuminate will be one and a half inches wide and one and a half inches high. Because the forty-eight-hole spiral necessarily must be larger than the thirty-six-hole spiral and the latter must, in turn, be larger than the twenty-four-hole spiral, it is possible to make one large disk with all three spirals in it.

Television, newest scientific infant, offers untold possibilities to the amateur wireless experimenter in his home workshop.




How to scribe the spiral for the holes, using piano wire and stylus. Detailed instructions and measurements are given in the article.

Then, by mounting the neon tube so that it can be moved in line with any one of the spirals, you will be prepared to receive from any station using a spiral with that same number of holes—provided, of course, that your motor drive can be varied in speed sufficiently to synchronize with the speeds at which these various spirals are driven.

The method of laying out the spiral is quite simple, but it is well to experiment with a large sheet of paper first.

FIRST draw a circle of any convenient size. Then step off on the circumference the number of holes there are to be in the spiral. You can do this without the use of a protractor merely by trying different compass openings until you find one that comes out just right. If, for instance, the first time you step the compass around the circle, you find that you pass the starting point before you reach the required number, close the compass a bit and try again.

After you have the points on the circumference located, draw from the center of the circle through these points. Then, with a ruler, set (Continued on page 140)

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the compass to the width of the picture, and with the hinge of the compass pointing directly at the center of the circle, find the point where the compass legs will touch adjacent radii. Use one of these points as the start of your spiral. These steps are illustrated at the top of page fifty-three.

A perfect spiral can be drawn by using a stud at the center with a piece of thin piano wire wound around it. The scriber should be passed through a loop in the end of the wire. As the scriber moves around, the wire winds about the stud and gradually draws the point toward the center, or unwinds and allows it to approach the rim, depending on which way the wire is wound around the stud.

The diameter of the stud should be equal to the height of the picture divided by 3.1416.

BEFORE you start to lay out the spirals on the metal, remember extreme accuracy is essential. See that you have plenty of light, use a sharp pointed scriber, and be careful that each punch mark exactly coincides with the spiral line. Also make sure the disk is mounted on the shaft of the motor so that the center of the motor shaft matches the center from which you laid out the spiral. The size of the hole in the center of the disk will depend on the diameter of the motor shaft.

A thin sheet of polished aluminum will do well for the television disk. The shiny surface will clearly show the lines scratched on it with the sharp steel point.

The diagrams show the principle of laying out a spiral. The same method should be followed no matter how many holes are to be used, or what size the picture is to be.

Now let us see how it works out in practice. Suppose, for instance, that you have a sheet of aluminum not less than twenty-four inches square and that you want to lay out on the one disk spirals for forty-eight, thirty-six and twenty-four hole pictures, and that you have a neon tube with a plate large enough to illuminate a picture one and a half inches square. With such definite specifications, it is possible to calculate many of the dimensions.

THE outer hole of the forty-eight-hole spiral will be exactly 11.45 inches from the center of the disk. The outer hole of the thirty-six-hole spiral will be 8.60 inches from the center, and the outer hole of the twenty-four-hole spiral will be 5.74 inches. The diameter of the stud about which the wire is wound will be $\frac{1}{32}$ inch. The same stud is used for all three spirals.

The holes are drilled in the disk at the intersections of the spiral with the radii. The size of these holes is determined by the number of holes in the spiral and the height of the picture. To find the size of the hole, divide the height of the picture by the number of holes and add ten percent to provide the necessary overlap. For the particular disk mentioned above, the holes in the forty-eight-hole spiral should be drilled with a No. 65 drill (drills smaller than No. 60 can be obtained in a jeweler's supply store). Drill the holes in the thirty-six-hole spiral with a No. 56 drill. Use a No. 50 drill for the twenty-four-hole spiral. It is desirable to drill the holes with a drill a couple of sizes smaller than specified, and then redrill with the right size to get the holes exactly right. Be sure to remove all burrs.

**BEGINNING next month the first complete story of the two brothers who gave us the airplane, written from new sources of information. Watch for it!**

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