

◊ \* ◦ • SYMBOLS FOR STARS IN ORDER OF BRIGHTNESS

The month's second eclipse is a total one of the moon, which occurs when that body enters the shadow of the earth on July 26. At 5:32 a.m. EST, the moon begins to enter the shaded region, and that, of course, will be after the moon has set and the sun has risen in the eastern part of the nation. In the Midwest, especially the more westerly parts, it should be possible to see the partially eclipsed moon low in the west shortly before dawn.

Still farther west, in the Rocky Mountain states, it may even be possible to see it totally eclipsed. The mid-eclipse occurs at 7:21 a.m. EST, which is 4:21 Pacific Standard time.

At San Francisco, sunrise occurs that day about 5:00 a.m. PST, so along the Pacific

Coast the beginning, at least, of the total phase should be easily visible, provided one happens to be up at that early hour!

**Celestial Time Table for July**

July	EST	
3	5:03 p.m.	Moon in last quarter.
5	1:00 p.m.	Earth farthest from sun, distance 94,450,000 miles.
7	7:44 a.m.	Moon passes Venus.
8	6:15 a.m.	Moon passes Jupiter.
10	9:28 p.m.	New moon, partial eclipse of sun visible in Arctic regions.
16	10:00 a.m.	Moon farthest, distance 251,600 miles.
18	7:43 p.m.	Moon passes Saturn.
	11:47 p.m.	Moon in first quarter.
22	5:00 p.m.	Venus passes Jupiter.
26	7:20 a.m.	Full moon, total eclipse of moon visible from western U. S.

28 9:00 a.m. Moon nearest, distance 225,200 miles.

Subtract one hour for CST, two hours for MST, and three for PST.

Science News Letter, June 27, 1953

TECHNOLOGY

**"Water Wings" Lift Small Boats From Water**

See Front Cover

► THE SMALL boat skipping across the cover of this week's SCIENCE NEWS LETTER is one of the Navy's experiments with hydrofoils. Currently under test at the Naval Air Station, Patuxent River, Md., hydrofoils are wing-like structures that act in water similar to the way airplane wings act in air.

Although they produce considerable drag at slow speeds, "water wings" can actually lift boats from the water, sharply reducing overall resistance. This permits boats to travel faster than they could with their hulls plowing through the water.

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ELECTRONICS

**Radio Circuits Built in Tiny, Replaceable Units**

► RADIO, TV and other electronic sets of the future can be built of small, replaceable and standardized units assembled without soldering. Parts of circuits would be replaced like tubes.

The National Bureau of Standards is investigating a novel method of cellular electronic construction proposed by Dr. P. J. Selgin of its engineering electronic laboratory. The new method makes full use of printed electronic circuits, also a Bureau of Standards development.

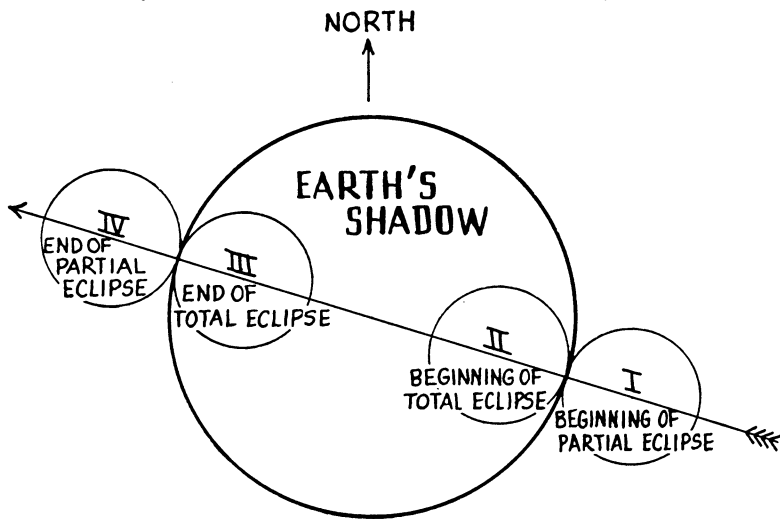
Individual molded cells of plastic, less than an inch on all sides, contain one or two circuit elements, such as resistors, capacitors and inductors. Each of these cells has three contacts, one on the top and two on the bottom. These press against the printed or etched circuits that replace conventional wires. The springs that keep the units in place are extensions of the tube socket contacts.

Twelve cells of this sort are assembled in a block along with two electron tubes. Electronic mechanisms are assembled from such blocks. When trouble occurs in any place, the offending cell is simply replaced by a spare and the repair is made.

The Navy Bureau of Aeronautics is supporting the development to improve construction and maintenance of electronic equipment. Printed circuits got their start in the research that gave our armed forces the proximity fuse, which bursts a shell when it comes near a plane or other target even if it does not hit it. The proximity fuse was also a Bureau of Standards development.

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**TOTAL ECLIPSE OF MOON, JULY 26, 1953 (PARTLY VISIBLE IN WESTERN U.S.)**



The large circle represents the shadow of the earth, and the small circles, I, II, III and IV, indicate the successive positions of the moon as it passes through the shadow. North is toward the top. Phases III and IV are not visible in the far western states. The four phases shown occur at the following times:

I	4:32 a.m. CST	3:32 a.m. MST	2:32 a.m. PST
II	5:30	4:30	3:30
III	7:11	6:11	5:11
IV	8:09	7:09	6:09

