



is "inferior conjunction," when it is between us and the sun. The other kind, when Mercury is on the far side of the sun, is "superior conjunction," which occurs on June 8.

Jupiter, which shone so brilliantly in the evening sky during the past winter, reaches conjunction on April 17. By the end of May it will have moved sufficiently far to the west of the sun to enable it to rise in the east about an hour before sunrise, and so begin to be visible at dawn as a morning star.

Though Venus does not reach superior conjunction until June 24, it is already nearly in the sun's direction and far beyond that body. At the beginning of April it rises less than an hour before sunrise, after the morning twilight has well begun.

Venus is still so low, when the sun appears, that it is hardly possible to see it. Not until next autumn will Venus have moved sufficiently far to the east of the sun to permit us to view it as an evening star low in the west.

**Celestial Time Table for April**

April	EST	
1	5:00 a.m.	Saturn opposite sun, distance 798,900,000 miles
2	3:48 a.m.	Moon is in first quarter
3	1:00 p.m.	Moon farthest, distance 251,300 miles
5	5:00 a.m.	Mercury between earth and sun
9	3:26 p.m.	Moon passes Saturn
10	2:00 a.m.	Neptune nearest, distance 2,722,000,000 miles
	3:53 a.m.	Full moon
12	5:48 a.m.	Moon passes Mars
17	2:00 a.m.	Jupiter beyond sun
	4:07 a.m.	Moon in last quarter
18	3:00 a.m.	Moon nearest, distance 229,800 miles
21	early a.m.	Meteors visible radiating from constellation of Lyra
24	2:27 a.m.	New moon
30	8:00 p.m.	Mars opposite sun, distance 52,360,000 miles

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

Science News Letter, March 29, 1952

**ELECTRONICS**

**Printed "Wires" for TV**

▶ PRINTED CIRCUITS for television receivers should save critical materials and reduce labor costs, W. H. Hannahs and Norman Stein of the Sylvania Electric Products Inc., have reported to the Institute of Radio Engineers in New York.

A new production technique divides television circuits into about 20 sub-assemblies, each having an electron tube and associated components.

Each unit is printed on two small cards, one being made of a ceramic material and the other made of a plastic. Electrical contacts between connecting circuit sub-assemblies is made by dipping the cards in molten solder and then joining them.

Printed circuits have been a reality ever since the proximity fuze was developed during World War II, although the principle has been known and thought prac-

tical since the early 1900's. Today they are being used commercially in some amplifiers, transmitters, receivers and hearing aids.

Basically, a circuit is printed on a ceramic or plastic plate using a metallic "ink." Circuits have been sprayed on, painted on, etched on, die-stamped on, dusted on, chemically deposited and applied through a vacuum process.

Printed television circuits are expected to reduce a television set's 500 hand-soldered connections by as much as 60%.

Already some printed circuits are being used in television sets. But though the circuits can be produced quickly, costs of materials needed to print the circuits will keep prices about the same as competitive sets not using printed circuits. Their performance is at least equal to commercial circuits.

Science News Letter, March 29, 1952

**OPTICS**

**Reverse Sunglasses Aid Pilots Flying at Night**

▶ REVERSE SUNGLASSES will help combat-wise World War II veteran pilots at the controls of night bombers and fighter planes in Korea.

They were designed, by Lt. Wayne E. Gully of the Air Force School of Aviation Medicine, Randolph Field, Tex., for the pilot with a slight defect of vision that can be corrected by eye glasses.

Just as corrective lenses can be tinted to give protection against the sun, the lenses of these glasses are treated to cut down the loss of light by reflection that is bothersome to a person wearing glasses at night.

The treatment consists in coating the lenses with magnesium fluoride, a substance used on costly camera lenses to cut down loss of light by reflection. To avoid the trouble with light glinting from behind on a small lens, these special night lenses are fitted into the standard Air Force sunglasses frames that cover the pilot's whole range of vision.

One drawback to the new glasses is that the soft metallic coating begins to wear off in irregular patches after a few months of normal use. Then the glasses must be cleaned and recoated. Further research may develop a way to harden the coating and do away with this inconvenience.

Science News Letter, March 29, 1952

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