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Satellite Digital Radio

THE automotive industry was supercharged 41 years ago by a new technology that had nothing to do with car engines or automotive design. The new innovation was FM radio.

The gripes of the driving public of the past are now being voiced by the driving public of today. People once again want more broadcasting choices, better sound quality, and something new with fewer or no commercials.

Your future radio might soon have buttons for AM, FM, and SAT selections. Most automobile manufacturers will start selling satellite radios as an extra on the 2003 models.

The brand of car that you buy will probably determine whose satellite radio you will receive. GM is providing XM radios, and Ford and Chrysler are providing Sirius systems.

Charges for these paid services differ. Steven Nunes, Chief of Operation at Yorktown Motors, indicates that, "Just like the On-Star system, new GM car owners at some dealerships will have free XM satellite service for their first year of car ownership."

The XM service will cost $9.95 per month after the first year. If your car comes with a Sirius system you will be charged $12.50 a month.

To determine which radio different car manufacturers are installing, go to the car manufacturer, Sirius, and XM websites: **www.siriusradio.com** and **www.xmradio.com**.

Satellite digital radio broadcasts at 2.3 GHz, which is nicknamed the S-band. At this time only Sirius and XM have purchased FCC licenses to broadcast satellite radio to the entire continental United States.

XM satellite radio started trial broadcasting in limited areas last September. Sirius satellite radio launched its radio broadcasting this past July.

Today, XM and Sirius both offer their own coast-to-coast digital program lineup of 100 channels. This means that you can drive from New York to California listening to the same radio station.

If you subscribe to one of these services, your radio will still be able to receive AM and FM by conventional means. When you tune into the S-band, your music, news, sports, and talk shows will be bounced down to your car from an Earth satellite.

These transmissions are created in the XM or Sirius broadcast facilities by conventional means, up to the point where they are transmitted into space through an uplink dish, such as the one shown in the photo.

Once broadcast into space, Sirius and XM use different satellite technology to bring your radio programming back to Earth. Two geo-stationary satellites return the XM satellite radio transmissions to Earth.

These satellites both orbit 22,223 miles above North America. Since their orbit matches the Earth's speed, or rotation, they stay above the same point on our planet as if they were fixed to Earth with a super-long cable.

The Sirius satellite system uses three satellites that are not in geo-stationary orbit. These satellites actually move across the continental United States in an elliptical pattern that keeps at least one bird over the U.S. at all times.

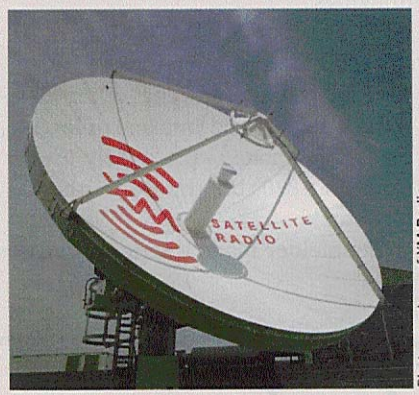

Photo courtesy of XM Radio

XM and Sirius are incompatible and will both require a strange new fish-fin antenna on your car. To remove transmission blind spots, XM and Sirius also transmit to a series of Earth-bound ground repeaters that guarantee clear reception everywhere.

Recalling the Facts

1. How do the XM satellites differ from those used by Sirius?
2. Describe how satellite radio gets its signal from the radio station to your car.
3. Can the XM and Sirius systems receive the same radio broadcasts?

Alan Pierce is a technology education consultant, technical writer, and public speaker on technology issues.