Canadian territory until more than 4½ hours have elapsed, when track 4 crosses Newfoundland heading northeast. Following this, at approximately 91 minute intervals, each of track 5 to track 13 cross part of Canada. During the 24 hours, ten of the 15.8 orbits cross some part of Canada.

On Figure 7 the ground track under the seventh orbit is drawn with a swath width of 100 km, centred under the orbital path. The seventh orbit crosses the equator 9 hours and 6 minutes after the beginning of the day being illustrated. The hatch marks show where the satellite is at two-minute intervals between 9 hours 16 minutes and 9 hours 36 minutes. Moving at 460 km/minute the satellite is above Canadian territory for eight minutes (between 9 hours 19 minutes and 9 hours 27 minutes).[30]

From Figure 6, it is clear that it will take a single satellite several days before its ground track can pass within 50 km of every point inside or near Canadian territory.

The territory of Canada is all between latitudes 42°N and 82°N. Therefore a satellite for surveillance of the Canadian North or the Arctic Ocean would have to be in an orbit with an inclination close to 90°. This has the property of overflying all of the earth's surface, whether or not territory south of 42°N is of interest.

One way to keep a satellite over northern latitudes as much as possible is to employ a highly eccentric (elongated) elliptical orbit, which comes close to the earth when it is at its southern extremity, and moves very fast, but departs to very high altitude over the northern hemisphere, above which it moves more slowly and therefore spends more time. Such an orbit can be given a period of 12 hours, so that its long dwell time above

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[30] The slight curvature of the tracks on Figure 7 is due to the rotation of the earth. If the earth did not rotate, the tracks would be straight lines on the gnomonic projection. But in the 20 minutes it takes to cross the mapped area the earth rotates through 5°, just enough to produce a noticeable curvature.