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SUNRISE, SUNSET, AND THE SHORTEST DAY OF THE YEAR  
by IRCA Special Features Editor Bill Hardy

Everyone knows that it gets dark earlier in the day during the fall and winter months than during the spring and summer months. And most folks know that sunrise comes later in the winter than it does during the summer. For DXers, of course, the shorter days and longer nights lead to better overall DX conditions on the AM broadcast band, plus more nighttime hours to actually DX.

Those of you who have your complete set of 12 sunrise/sunset maps for each month of the year can readily see the earlier sunset times and later sunrise times in months such as November, December, and January. These times are computed by the FCC for each community, based on sunrise and sunset on the 15th day of each particular month rounded off to the nearest 15 minutes. (The FCC lists the times in each station's license, so that some enterprising station doesn't come up with a way of computing sunrise/sunset to give itself longer hours!)

There is little variation in sunrise/sunset times for a given day from one year to another (what little variation there is, is primarily due to leap year coming up every four years). Thus, sunset on Feb. 15, 1975, is within a minute or two of the same time as sunset on Feb. 15, 1976, and thus the FCC can apply the sunrise/sunset standard year after year without change.

I always used to wonder why sunrise times for some stations were 15 minutes later in January than in December. I was brought up believing that December 21st was the shortest day of the year, and that June 21st was the longest. So why a later sunrise on January 15th than December 15th?

The explanation is really fairly simple.

Almanacs, such as the World Almanac, have tables listing sunrise and sunset times (real times, not the FCC rounded-off times) for various latitudes on each day of the year. These are based on the time meridians (75°, 90°, 105°, 120°) used for the standard time zones. If you live east or west of these meridians, you add or subtract 4 minutes for each degree longitude. I live almost exactly at 124°W longitude, so I add 16 minutes to each time in the table; if you live east of the meridian, you subtract. There's also a varying corrector to interpolate times between the listed parallels of 30°, 40°, 50°, etc., north latitude. Since the times are accurate within one or two minutes each year, it really doesn't matter if your almanac isn't for the current year.

Let's use 40°N latitude as an example, as this runs centrally through most of the U.S. midway between the Canadian and Mexican/Gulf Coast borders. At this latitude, the earliest sunrises and the latest sunsets are NOT on December 21st. The earliest sunsets are a clump of several days with the same early time, centering around December 8th. The same is true of the latest sunrises. Several days tie for the same late time, centering around January 5th. The reason for this evidently has something to do with the earth's orbit, which is not perfectly circular around the sun.

So why is December 21st considered the "shortest day of the year," if there are several days with later sunrises and several days with earlier sunsets? Well, because the "day" is the time between sunrise and sunset. And on December 21st, there is less time between sunrise and sunset than on any other day.

On December 8th, when sunset is as early as it will be all year, sunrise continues to occur a minute or so later each morning. Between December 8th and 21st, sunrise continues to subtract more daylight in the morning than is added at sunset each evening. On December 21st, the loss and gain are even. From December 21st to January 5th, more daylight is added at sunset than is being lost at sunrise, so even though sunrise is later, the total day is getting longer.

The dates used above are based on 40°N latitude, the nation's approximate midpoint. Further south and further north, the same thing happens, although the dates for the earliest sunset and latest sunrise  
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may be a little different. At 50°N (southern Canada), the earliest sunrises center on December 13th, and the latest sunsets center on December 31st. At 30°N, the earliest sunsets center on December 2nd, and the latest sunrises center on January 10th. You can interpolate your own values - the dates for 35°N would be halfway between those for 30°N and 40°N, etc.

And, of course, the same holds true in June and early July, with the earliest sunrise times occurring just before June 21st and the latest sunsets just after June 21st, although the difference is not so pronounced as in the winter.

I hope this information on late sunrise times and early sunset times will be interesting and possibly helpful to DXers, whether beginning or experienced DXers. If you want to try for a most-wanted daytimer on sunset skip when the sunset time is earliest and nighttime conditions prevail the most, you'll know that you have to try before December 21st. And if you want to try on sunrise skip in the morning, maximum nighttime conditions will prevail after December 21st. Actually, since the difference between true sunrise/sunset and licensed sunrise/sunset is less at these turnaround points in December than it is at the beginning or end of some of the other months, you might be best trying on the first days of January, February, March, April, or May, or the last days of July, August, September, October, or November. Then you'll find stations still using day power/pattern as much as a half hour or more before actual sunrise and after actual sunset.  
Good luck! -BH.

Crookston, Minnesota  
1000 watts Day — 500 watts Night 1260 Kc.  
**KROX**  
Studios in the Eagles Building  
Confirming Reception of KROX by Hal Christianson  
on 9/12/74 1974 at 500 CPT.  
"THE CROOKSTON BROADCASTING CO."  
William J. Kiewel Bill Kiewel, Manager

1,000 WATTS AM <sup>1470</sup> 14,070 WATTS ERP. FM

AM **WILY** WXX-FM  
1210 KC FM 95.3

CENTRALIA, ILLINOIS

Verifies Reception of WILY ---AM- By

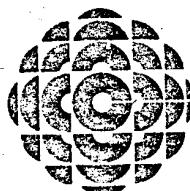
Hal Christianson

Winnipeg, Manitoba, Canada

Date October 14, 1974 Time 6:15 a.m. to 6:22

Remarks Thanks for your letter. Distance approx. 880 miles

Certified by Bruce Henderson



CBC RADIO  
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