

WSM RADIO FIELD STRENGTH DURING AUGUST 21, 2017 ECLIPSE

| TIME (EDT) | FIELD ($\mu\text{V/M}$) | COMMENT |
|------------|---------------------------|--|
| 02:11 PM | 35 | |
| 02:18 PM | 26 | |
| 02:20 PM | 31 | |
| 02:22 PM | 28 | |
| 02:25 PM | 25 | |
| 02:26 PM | 30 | |
| 02:27 PM | 41 | |
| 02:28 PM | 27 | Predicted start of total eclipse at WSM was 14:28:24 |
| 02:29 PM | 30 | Predicted end of total eclipse at WSM was 14:28:48 |
| 02:30 PM | 80 | |
| 02:31 PM | 60 | Predicted start of total eclipse at Fontana was 14:34:15 |
| 02:37 PM | 100 | Gap in data – too busy taking in the majesty! |
| 02:39 PM | 2400 | Predicted end of total eclipse at Fontana was 14:36:38 |
| 02:40 PM | 800 | |
| 02:41 PM | 100 | |
| 02:42 PM | 170 | |
| 02:44 PM | 70 | |

Method: A FIM-21 was set in position at Fontana Dam, 171 miles from class-A station WSM Nashville. Measurements of WSM field strength were taken at irregular intervals and recorded by hand during the August 21 total eclipse.

Field strength meter was a calibrated Potomac FIM-21, used as per manufacturer's specifications. A reference FS reading was taken at 23:45 PM EDT from Clinton, TN (north of Knoxville) the night before. It showed typical skywave conditions with field intensity varying between 1 and 2.5 mV/M.

Local times are plus/minus 30 seconds.

Distance from WSM transmitter to Fontana Dam was 171 miles.

Duration of total eclipse at WSM was just 24 seconds.

Duration of total eclipse at Fontana Dam was 2:23.

Timings were taken from the interactive eclipse map at NASA.gov.

It was assumed that WSM was not experiencing technical difficulty during the measurements.

Preliminary Conclusions:

Shortly before totality at the receiving location, measured field strength climbed. It peaked a few minutes after totality. The enhanced field strength lasted slightly longer than the length of totality at the receiver. Brief totality at the transmitter made a small change in received field strength. Maximum FS enhancement during the eclipse raised FS to nearly what I saw the night before during skywave measurements. D-layer ionization (and absorption) was not instantaneous when the sun re-appeared, but it was rapid. Ionization of the D-layer apparently is not affected by the corona seen during totality, rather by the energy streaming from the sun's surface.

Dale Lamm 8/23/17