History:

It became apparent in the early 1960s that certain space weather events might interfere with the stated U.S. objective of a manned mission to the moon. In particular, the sun emits continuous electromagnetic energy and electrically charged particles, which can cause disturbances in the near-Earth environment and disrupt satellite communications. The United States Air Force Research Laboratory (AFRL) was assigned the task of developing and validating a network of ground-based solar observatories. AFRL established a worldwide network called the Radio Solar Telescope Network (RSTN). The prototype was assembled and operated during the early 1960s. Official solar patrols from this prototype began in 1966.

The original Solar Observing Optical Network (SOON) network was designed by Dr. Richard B. Dunn, who commissioned the Tower Telescope (later designated the Dunn Solar Tower) on Sacramento Peak, Sunspot, NM in the late 60s.

This combination of radio and optical telescopes is referred to as the Solar Electro Optical Network (SEON).

SEON Overview:
The Solar Electro-Optical Network (SEON) is a real-time solar optical and radio observing and analysis network. The SEON is comprised of five locations operating a Solar Observing Optical Network (SOON) telescope, Radio Solar Telescope Network (RSTN) telescope or combination of both. The network provides timely and accurate solar alerts and analyses to the Space Weather Operations Center (SpaceWOC), 2d Weather Squadron (2 WS), and the National Oceanic and Atmospheric Administration's (NOAA) Space Weather Prediction Center (SWPC).

RSTN Overview:
The RSTN telescopes gather standardized solar radio data in computer assisted ("automatic") mode. The RSTN system produces discrete frequency radio observations using Radio Interference Measuring Sets (RIMS), and wideband (spectral) radio observations using the Solar Radio Spectrograph (SRS). Operating nominally, the RSTN provides 24/7/365 coverage of the sun, even during cloudy conditions. There are several observatories that operate RSTN telescopes positioned in the CONUS, Eastern and Western Pacific, and Europe.

Radio Interference Measuring Set (RIMS) One Second Data:
The RIMS 1 second data shows total power output in SFU (10^{-22}Watts*m^{-2}*Hz^{-1}) at 1 second time intervals for each monitored frequency. This value is the total raw power received by the RIMS.

Integrated FLUX (IFLUX or Noon Flux):
The IFLUX or "Noon Flux" is measured, daily at central meridian passage of the Sun for each observatory. This ensures a standardized process for the Noon Flux measurement. For the purposes of this file, "IFLUX" and "Noon Flux" are interchangeable and refer to the same measurement. The Noon Flux measurement determines the quiet Sun (i.e., background) thermal radio output received by Earth at the associated frequencies. Like the one second data, the Noon Flux reports total raw power received by the sensors at each observatory during central meridian passage. These values can then be used as calibration references or to track/monitor daily changes within the solar atmosphere.

IFLUX Qualifiers:
In addition to raw numbers, the noon flux values have qualifiers attached to them which indicate confidence in the value being reported. These qualifiers identify values which may be affected by local conditions (weather, equipment, interference etc.) or variances on the solar disk which may skew values. These qualifiers are:

1 – Good data
2 – Weather attenuated (value low)
3 – Interference (value high)
4 – Unknown (values too high or too low with unknown source)
5 – Burst (values high due to increased solar output)

Solar Radio Spectrograph:
The Solar Radio Spectrograph (SRS) differs from RIMS radiometers in instrumentation, theory of operation, and type of activity observed. The SRS detects spectral solar radio frequency emissions within the meter and decameter (tens of meters) region of the radio spectrum. This spectral data is then projected graphically for analysis. Analysts determine and report solar activity based on spectral signature of the events. CME shock speed analysis occurs on the SRS in real time by RSTN Analysts and is often the first chronographic data reported.