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**High-k Scattering and FIReTIP Diagnostic Upgrades for NSTX-U**[1] ROBERT BARCHFELD, EVAN SCOTT, CALVIN DOMIER, CHRISTOPHER MUSCATELLO, PAUL RIEMENSCHNEIDER, MOHAMMAD SOHRABI, NEVILLE LUHMANN, UC Davis, YANG REN, ROBERT KAITA, Princeton Plasma Physics Laboratory — A major upgrade to the High-k Scattering system is underway on NSTX-U, which is being transformed from a primarily toroidal detection geometry (for $k_r$ measurements) to a poloidal detection geometry (for $k_\theta$ measurements) in which a probe beam is launched from Bay G and collected on Bay L. Combined with an increase in probing frequency to 693 GHz, the poloidal wavenumber sensitivity has been extended from $k_\theta = 7$ cm$^{-1}$ up to 40 cm$^{-1}$. The system will be installed and commissioned in 2016 with an initial 4-channel receiver, with plans to eventually upgrade to an 8x2 configuration, which can probe the plasma from the core out to the edge of the pedestal region. The Far Infrared Tangential Interferometer/Polarimeter (FIReTIP) system is being upgraded with field programmable gate array (FPGA) electronics to support real time feedback density control, and will be installed on Bay G this fall. Design and implementation details regarding both diagnostics will be presented.

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