Purpose:
To develop a filmless method to perform CT gantry tilt angle quality control test by using commercialy available phantom to adapt the modern digital radiological environment.

Method and Materials:
A Catphan® 500 CT performance phantom (The Phantom Laboratory, Inc.) was set up on the CT patient couch according to manufacturer's instructions with the CTP401 module of the phantom centered in the scan plane. The CTP401 module contains four ramps (two vertical and two horizontal) which are angled $\pm 23°$ from the scan plane when gantry tilt is $0°$. Axial scans through the ramps were acquired over a range of prescribed slice thicknesses to determine slice sensitivity profile width, or true slice thickness (T_{slice}), by averaging the slice sensitivity profile width derived from all four ramps. Following this, gantry tilt (θ) was measured over the entire range of tilt ($-30°$ to $+30°$) by scanning the CTP401 module through the vertical ramp of the same sign ($-23°$ or $+23°$) and measuring the FWHM length ($L_{FWHM,\theta}$) of the ramp image. Then, gantry tilt (θ) was calculated as $23° + \cot^{-1}(L_{FWHM,\theta}/T_{slice})$ for gantry tilts less than $23°$, and as $23° - \cot^{-1}(L_{FWHM,\theta}/T_{slice})$ for gantry tilts greater than $23°$. Calculated gantry angles were validated by comparison to gantry angles determined using the conventional film measurement method described in AAPM Report No. 39. Measurements were obtained at nine gantry tilt angles on $16-$ slice CT systems.

Results:
Different slice thicknesses obtained at 9 different angles will be presented. On average, gantry tilt measured using the Catphan agreed with the conventional film measurement method within $1°$.

Conclusion:
This new method removes the requirement to use film for gantry tilt measurements. It is easy to calculate and can be performed without purchasing additional phantoms or equipment. It could be applied to clinical CT gantry angle QC in either on diagnostic or simulation CT .