

RTCA Special Committee 186, Working Group 5

ADS-B UAT MOPS

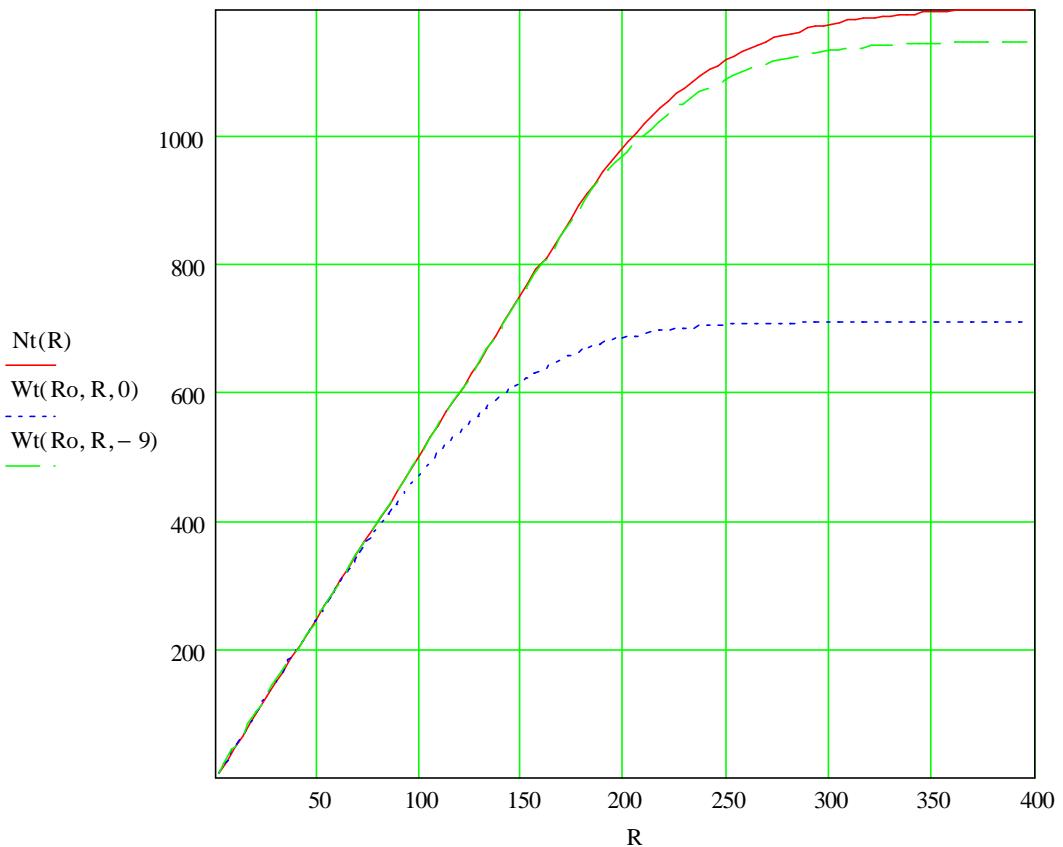
Meeting #6

UAT Performance Estimates

Presented by: S. R. Jones

MITRE/CAASD

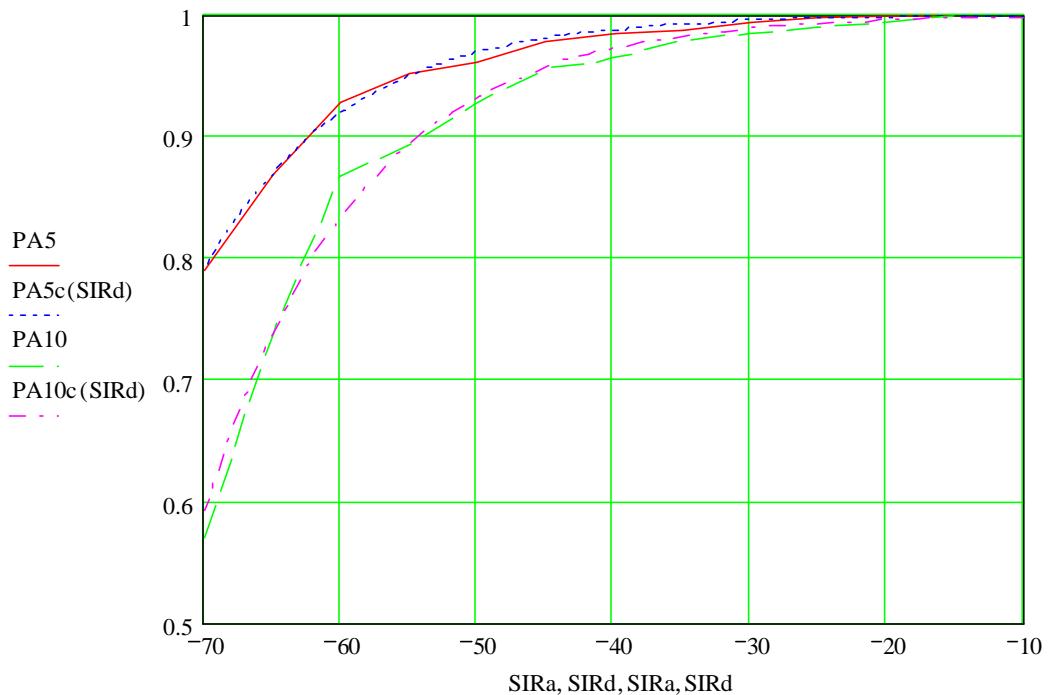
$$Nt(60) = 302 \quad ah = 40000 \quad D1 = 246 \quad Ro = 135 \quad \mu_u = 0 \quad \sigma_u = 4 \quad Rp = 400 \quad Nt(Rp) = 1199$$



Assumed traffic distribution for LA 2020

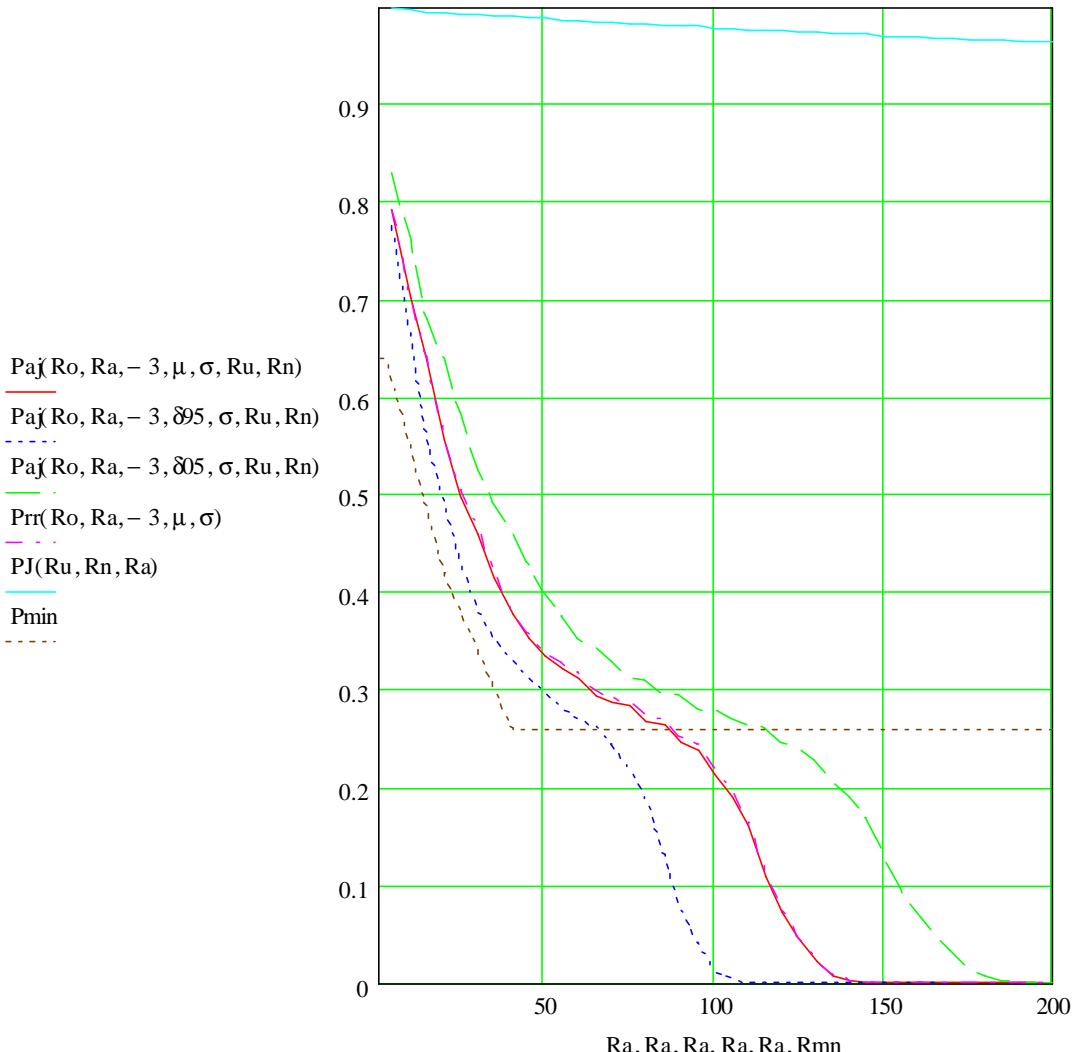
$$PA5c(SIRd) := 1 - 0.012 \exp[-0.095(SIRd + 40)]$$

$$PA10c(SIRd) := 1 - 0.016 \exp[-0.09(SIRd + 34)]$$



JTIDS interference model for UAT air message and TSDFs of 50% and 100%. Light scenario implies $p = 0.98$ at MTL, heavy scenario implies $p = 0.93$ at MTL

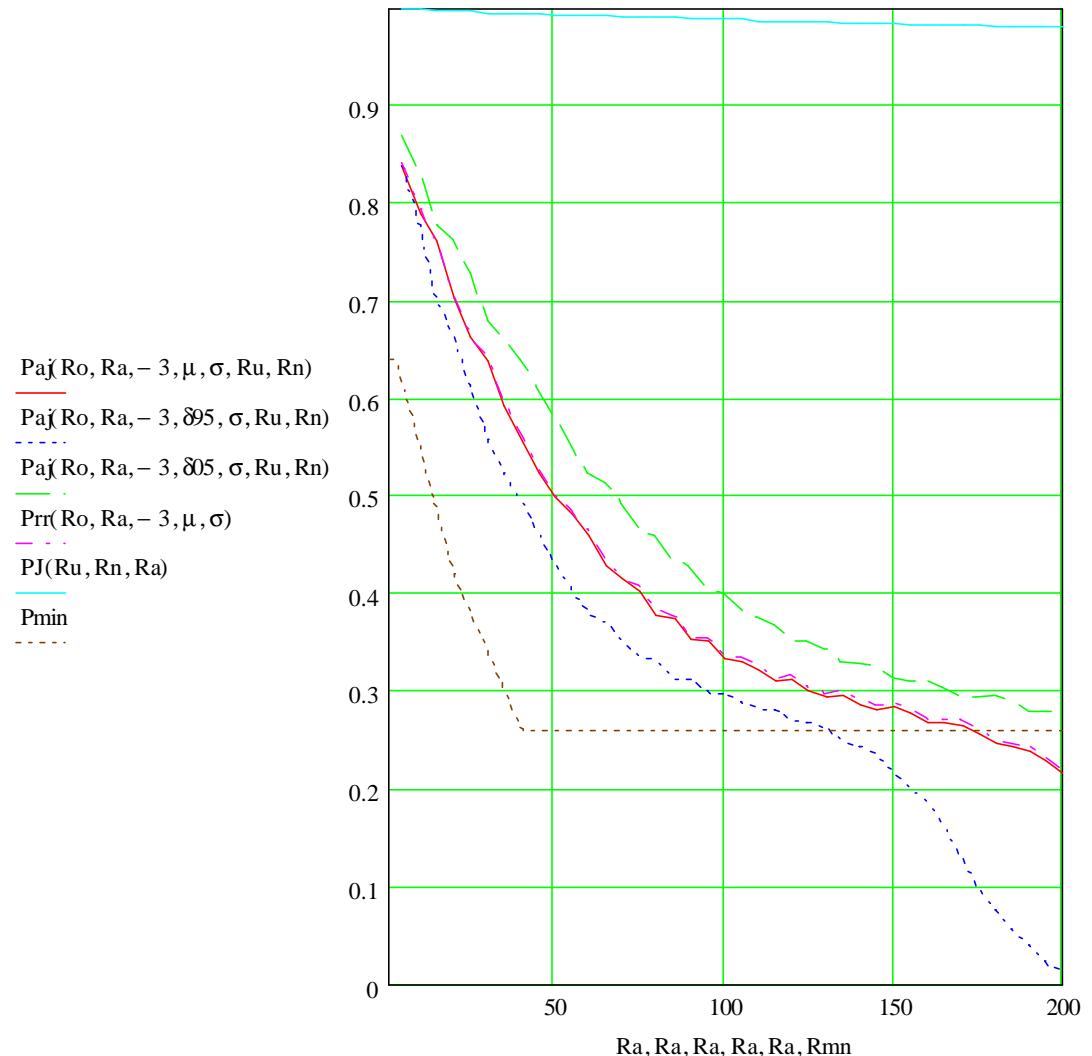
$$\begin{aligned}
Nt(400) &= 1199 & \mu_u &= 0 & \sigma_u &= 4 & faa(Ro, Rp, 0) &= 888 & ah &= 40000 & Ro &= 135 & D1 &= 246 \\
\sigma_c &= 1.5 & \mu &= -3 & \sigma &= 0.5 & \eta &= 0.9 & \gamma_u &= 9 & MTL - T &= 2 & Pm(0, T) &= 0.9 \\
Ru &= 8 & Rn &= 20 & Gs &= 1 & Ps &= 5 & Gu &= 1 & Pu &= 200 & Gn &= 1 & Pn &= 200
\end{aligned}$$



Probability of UAT message decode as a function of separation range for 50% of the user equipage class population (dashed) and JTIDS effect on UAT message decode for conditions shown (dash-dot), and joint results (solid). Joint results for 95% of class (dotted)

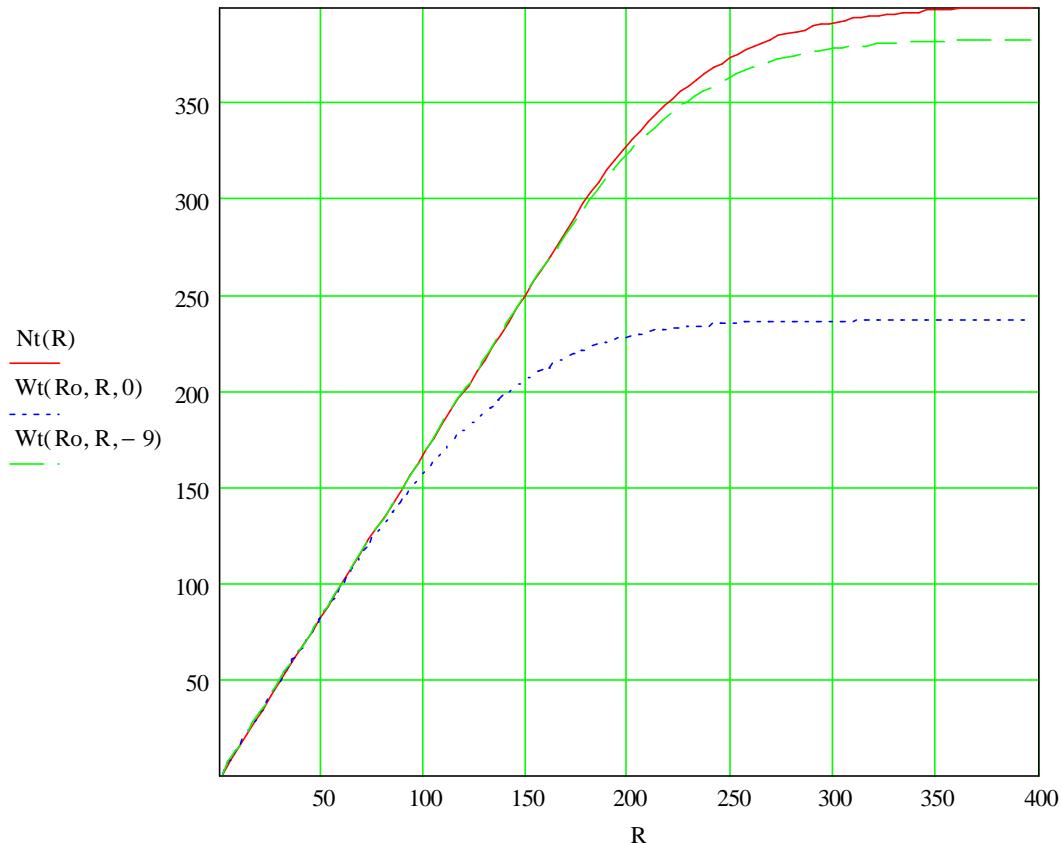
Low power (25w) class performance for LA 2020 scenario with light JTIDS (0.98 at 93 nmi.) and DME/co-site interference

$$\begin{aligned}
N_t(400) &= 1199 & \mu_u &= 0 & \sigma_u &= 4 & f_{aa}(Ro, Rp, 0) &= 888 & a_h &= 40000 & Ro &= 135 & D_1 &= 246 \\
\sigma_c &= 1.5 & \mu &= 3 & \sigma &= 0.5 & \eta &= 0.9 & \gamma_u &= 9 & MTL - T &= 2 & P_m(0, T) &= 0.9 \\
R_u &= 8 & R_n &= 20 & G_s &= 1 & P_s &= 22.4 & G_u &= 1 & P_u &= 200 & G_n &= 1 & P_n &= 200
\end{aligned}$$



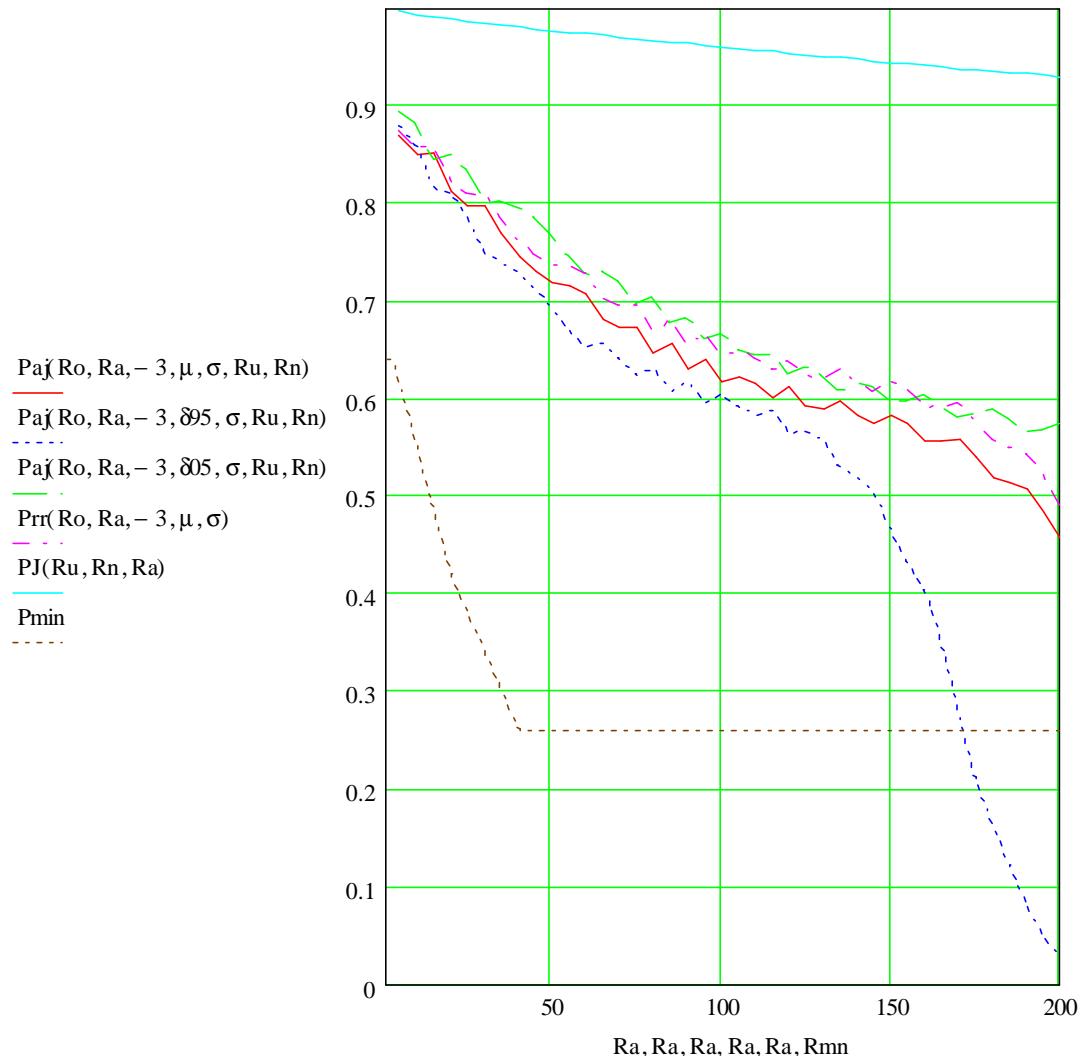
High power (100w) class performance for LA 2020 scenario with light JTIDS (0.98 at 135 nmi.) and DME/co-site interference

$$Nt(60) = 101 \quad ah = 40000 \quad D1 = 246 \quad Ro = 135 \quad \mu\mu = 0 \quad \sigma u = 4 \quad Rp = 400 \quad Nt(Rp) = 400$$



Low density traffic scenario

$$\begin{aligned}
N_t(400) &= 400 & \mu_u &= 0 & \sigma_u &= 4 & faa(Ro, Rp, 0) &= 296 & ah &= 40000 & Ro &= 135 & D1 &= 246 \\
\sigma_c &= 1.5 & \mu &= 3 & \sigma &= 0.5 & \eta &= 0.9 & \gamma_u &= 9 & MTL - T &= 2 & Pm(0, T) &= 0.9 \\
Ru &= 8 & Rn &= 20 & Gs &= 1 & Ps &= 2 & Gu &= 1 & Pu &= 700 & Gn &= 1 & Pn &= 200
\end{aligned}$$



High power (100w) class performance in low density scenario with heavy JTIDS (0.93 at 135 nmi.) and DME/co-site interference