Revised Draft

PROPOSAL OF RECOMMENDATION CCTF 2 (2006):
Concerning secondary representations of the second

The Consultative Committee for Time and Frequency,
considering that

- a common list of "Recommended frequency standard values for applications including the practical realisation of the metre and secondary representations of the second" shall be established
- the CCL/CCTF Joint Working Group (JWG) on the Mise en Pratique of the Definition of the Metre and the Secondary Representations of the Second in its meeting at the BIPM in September 2005 discussed possible candidates to be included in this list for secondary representations of the second,
- the CCL/CCTF JWG reviewed and updated the values for the Hg ion, Sr ion, Yb ion, and the Sr neutral atom transition in its session in September 2006
- the CCTF in its RECOMMENDATION CCTF 1 (2004) already recommended the unperturbed ground-state hyperfine quantum transition of ^{87}Rb as secondary representation of the second

recommends

that the following radiations shall be used as secondary representations of the second and be included into the new list of "Recommended frequency standard values for applications including the practical realisation of the metre and secondary representations of the second"

- the unperturbed ground-state hyperfine quantum transition of ^{87}Rb with a frequency of
  $f_{^{87}\mathrm{Rb}}$ = 6 834 682 610.904 324 Hz
  and an estimated relative standard uncertainty (1 σ) of 3×10^{-15},
- the unperturbed optical 5s $^2S_{1/2}$ – 4d $^2D_{5/2}$ transition of the $^{88}Sr^+$ ion with a frequency of
  $f_{^{88}\mathrm{Sr}^+}$ = 444 779 044 095 484 Hz
  and a relative uncertainty of 7×10^{-15},
- the unperturbed optical 5d^{10}6s $^2S_{1/2}$ (F = 0) – 5d^{9}6s^2 $^2D_{5/2}$ (F =2) transition of the $^{199}Hg^+$ ion with a frequency of
  $f_{^{199}\mathrm{Hg}^+}$ = 1 064 721 609 899 145 Hz
  and a relative standard uncertainty of 3×10^{-15},
- the unperturbed optical 6s $^2S_{1/2}$ (F = 0) – 5d $^2D_{5/2}$ (F =2) transition of the $^{171}Yb^+$ ion with a frequency of
  $f_{^{171}\mathrm{Yb}^+}$ = 688 358 979 309 308 Hz
  and a relative standard uncertainty of 9×10^{-15},
- the unperturbed optical transition 5s^2 $^1S_0$ – 5s5p $^3P_0$ ^{87}Sr neutral atom with a frequency of
  $f_{^{87}\mathrm{Sr}}$ = 429 228 004 229 877 Hz
  and a relative standard uncertainty of 1.5×10^{-14}.