$$\Psi_{240} = C_1 \left(|22du\rangle + |22ud\rangle + |2du2\rangle + |2ud2\rangle - |d22u\rangle + |du22\rangle - |u22d\rangle + |ud22\rangle \right)$$

$$C_1 = \frac{1}{2\sqrt{2}}$$