Addendum for Note 249(2)

If:
$$\underline{A} = \frac{1}{2}\underline{B} \times \underline{r} \quad -(1)$$
then we must have:
$$(\underline{r} \cdot \underline{\nabla})\underline{B} - (\underline{\nabla} \cdot \underline{B})\underline{r} = \underline{0} \quad -(2)$$
Consider the rotating magnetic field:
$$\underline{B} = \frac{B^{(0)}}{\sqrt{2}}(\underline{i} - i\underline{j})e^{i\omega t} \quad -(3)$$
then:
$$\underline{\nabla} \cdot \underline{B} = 0 \quad -(4)$$
and
$$(\underline{r} \cdot \underline{\nabla})\underline{B} = \left(X\frac{\partial}{\partial X} + Y\frac{\partial}{\partial Y} + Z\frac{\partial}{\partial Z}\right)\underline{B}$$
$$= \underline{0} \quad -(5)$$

The vector potential is:
$$\underline{A} = \frac{1}{2}\underline{B} \times \underline{r} = \frac{1}{2}\begin{vmatrix} \underline{i} & \underline{j} & \underline{k} \\ 1 & -i & 0 \\ X & Y & Z \end{vmatrix}\frac{B^{(0)}}{\sqrt{2}}e^{i\omega t}$$
$$= \frac{B^{(0)}}{2\sqrt{2}}e^{i\omega t}\left(-Z(1+i)\underline{j} + \underline{k}(Y - iX)\right) \quad -(6)$$

So computer algebra can be used to rework note 249(2) with this vector potential.