ARMAX EQUATIONS IN GENERAL

$$y_t = \frac{\omega_t(L)}{\delta_t(L)} X_{t-b} + \frac{w_t(L)}{d_t(L)} I_{t-\tau} + \frac{\Theta_t(L)\theta_t(L)}{\nabla_t \nabla_s^s \Phi_t(L)\phi_t(L)} e_t,$$

where

y_t = *dependent series*

$\omega_t(L)$ = *lagged or led polynomial of* ω_t

$\theta_t(L)$ = *nonseasonal moving average polynomial*

$\Theta_t(L)$ = *seasonal moving average polynomial*

∇_t = *first difference*

∇_s^s = *seasonal difference*

$\phi_t(L)$ = *autoregressive polynomial*

$\Phi_t(L)$ = *seasonal autoregressive polynomial*

X_{t-b} = *time varying parameters (prewhitened and differenced if nec.)* $_{b=\text{time lag}}$

$I_{t-\tau}$ = *computer based automatic intervention detection and modeling* $_{\tau=\text{time lag}}$
(outliers, seasonal pulses, local trends, level shifts, etc.)

e_t = *disturbance*