

Y-method Input Data Format

```

&-----1-----2-----3-----4-----5-----6-----7-----8
&DATA SYST ← The line which starts with "&" is a comment line.
DATA
  BANK 1000.000 60.000 IEEJ WEST 30-MACHINE MODEL (PEAK)
  
```

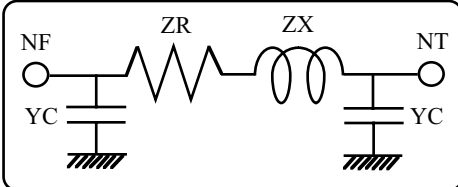
Name of Power System Data
 System Base [MVA]
 System Frequency [Hz]
 Header of the power system to be analyzed (starts from 41 columns)

Transmission Line Data

```

Line No. FROM Node No. TO Node No. Line Name starts from 69 columns
&-----1-----2-----3-----4-----5-----6-----7-----8
T 1010 2010 1020 1 0.00168 0.05050 0.02444
T 1020 1020 1030 2 0.00182 0.05470 0.02648
T 20 1 2 1 0.00420 0.12600 0.06100 LINE20-1
TEND
  
```

Number of Circuits (BLANK means 1 cct.)
 Positive-phase Sequence Resistance ZR [pu / 1cct.]
 Positive-phase Sequence Reactance ZX [pu / 1cct.]
 Positive-phase Sequence Charging Capacity YC [pu / 1cct.]



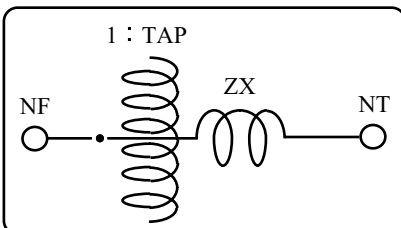
End of Transmission Line Data

Transformer Data

```

Transformer No. FROM Node No. TO Node No. Number of Banks (BLANK means 1 Bank)
&-----1-----2-----3-----4-----5-----6-----7-----8
X 3010 3010 2010 1 0.01490 1.00000 0.0
X 3020 3020 2020 1 0.02690 1.00000 0.0
X 910 21 1 1 0.00932 1.00000 0.00000 G1-TR
XEND
  
```

Positive-phase Sequence Reactance ZX [pu / 1 bank]
 In-phase TAP ratio [pu]
 Name starts from 69 columns



End of Transformer Data

Node Data

```

Node No. Generator Active Power Output [pu] Active Power Load [pu]
&-----1-----2-----3-----4-----5-----6-----7-----8
N 3010 1.01 8.32 0.0 0.44 0.088 0.0 NODE1
NEND
  
```

Specified Voltage [pu] at a P-V node
 Blank means a P-Q node
 Generator Reactive Power Output [pu]
 Reactive Power Load [pu]
 Connected Reactive Power Supply Devices [pu, MVA]

End of Node Data

DEND
 GCON
 GSAT

Generator Data

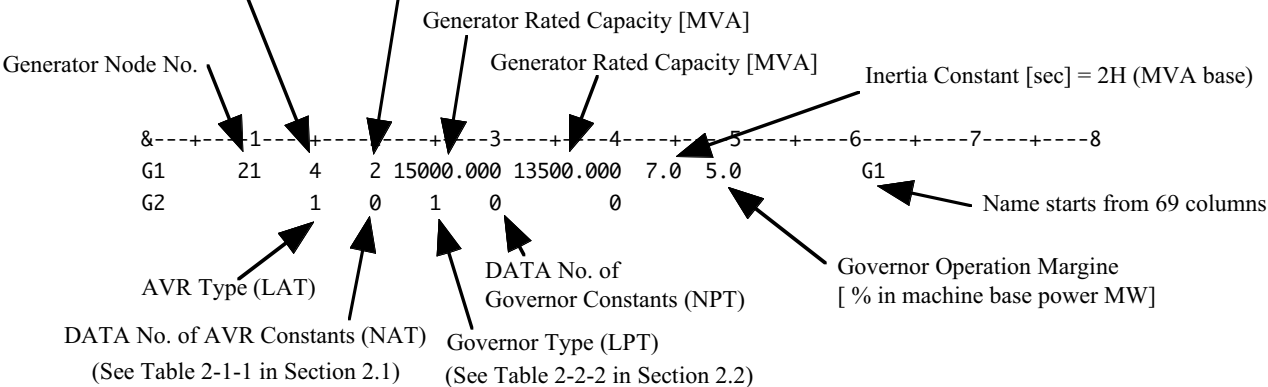
Type of Generator Constants

NGT = 2 : Large Thermal Generator
 6 : Nuclear Generator
 8 : Large Hydro Generator

(1) If NGT > 0 then "the Standard Generator Constants" are used.
 Only G1 and G2 cards are required.

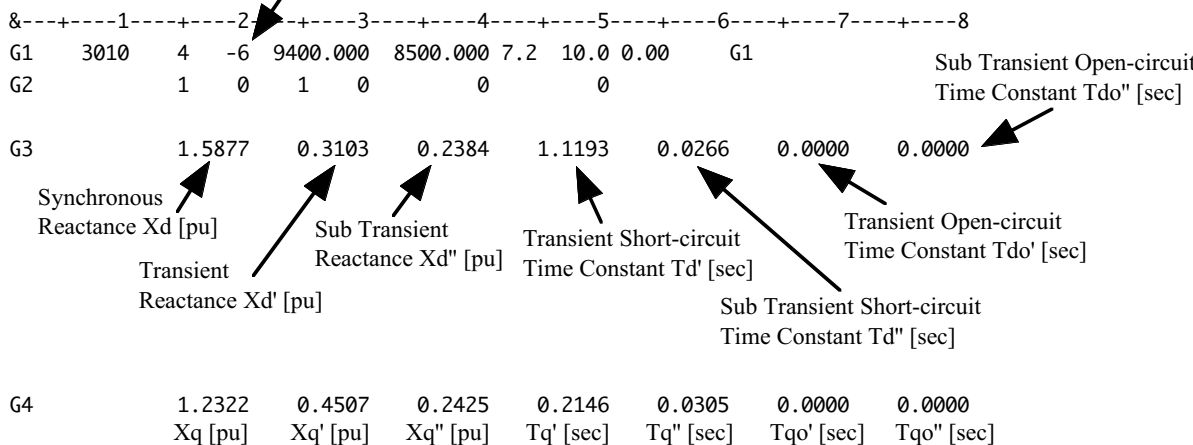
(2) If NGT < 0 then Generator Constants are specified by G3, G4 and G5 cards

Type of Generator Model (LGT)
 4 : Generator have 1 D-axis and 1 Q-axis damper



LAT + 100 : ΔP input type PSS is added
 LAT + 50 : Self-excited excitation system
 LAT + 150 : Self-excited excitation system with ΔP input type PSS

Because of NGT < 0, Generator Constants are specified by G3, G4 and G5 cards.



End of Generator Data

GEND

BLANK is regarded as $X2 = (Xd'' + Xq'') * 0.5$

AVR Data

LAT = 102 : Thyristor Excitation System Model with ΔP Input Type PSS

```

&---+---1---+---2---+---3---+---4---+---5---+---6---+---7---+---8
@  LATNAT< 1 >< 2 >< 3 >< 4 >< 5 >< 6 >< 7 >< 8 >< 9 >< 10>< 11>< 12>
A1 102 1 1.0 0.0 1.0 0.1 100. -100. 150. 0.0 5.0 -5.0 0.05 0.2
@PSS < 1 >< 2 >< 3 >< 4 >< 5 >< 6 >< 7 >< 8 >< 9 >< 10>< 11>< 12>< 13>
PSS 0.0 5.0 0.25 1.25 0.0 0.0 0.0 0.0 1.0 0.02 0.1 -0.1 0.0
AEND
  
```

AVR Data (the same as LAT = 2)

PSS Data

END of AVR Data

PEND
SEND
MEND
REND

Load Characteristic Data

Load Characteristic Data of NLT = 2

```

&---+---1---+---2---+---3---+---4---+---5---+---6---+---7---+---8
@L > <NLT><IFG> < XL1 >< XL2 >< XL3 >< XL4 >< XL5 >><XL6><XL7>
L 2 -1 1.0 2.0 3.33 0.0 0.0 0.7 0.0
  
```

Load Characteristic Data of NLT = 107

```

@L > <NLT><IFG> < XL1 >< XL2 >< XL3 >< XL4 >< XL5 >><XL6><XL7>
@< XL8 >< XL9 >< XL10 >< XL11 >
@ 107 -1 1.0 2.0 3.33 0.0 0.0 0.7 0.0
@ 10.0 10.0 0.15 0.0
&---+---1---+---2---+---3---+---4---+---5---+---6---+---7---+---8
  
```

LEND

END of Load Characteristic Data

FEND
ZEND
STOP

Load Flow Calculation Control Data

```

&-----1-----2-----3-----4-----5-----6-----7-----8
&DATA FLOW
C 10-MCHN PEAK 30 ← Phase Angle Reference Node No. 2
CS 20 .0001
CEND
TEND
XEND
NEND
DEND
    
```

2 : The π type equivalent circuit is used.
 Normally, the transmission line data are converted to the 4 terminal constants.
 In this case, the calculation error increases as the transmission line becomes longer.

Y-Method Program Control Data

```

&-----1-----2-----3-----4-----5-----6-----7-----8
&DATA DYNA
BANK PEAK
DEND
&-----1-----2-----3-----4-----5-----6-----7-----8
GCHK 0 0
GCON
GSAT
GEND
AEND
PEND
SEND
MEND
REND
LEND
FEND
ZEND
    
```

Default Settings : Calculation Time Step : 0.01 [sec]
 Maximum Iteration Number : 40
 Convergence Check Criterion : 0.0001 [pu]

Sequence Data

```

END of the Simulation Time [sec] Out-of-step cut-off control phase angle [deg]
Header Phase Angle Reference Generator Node No.
&-----1-----2-----3-----4-----5-----6-----7-----8
*** 30-machine PEAK A-point CCT 3LG-0 ***
Q 20.000 300.0 3150
Q N
Q G ABC 1100 R 2 10
Q 0 ABC 1100 2500
QEND
    
```

0.00
 0.10
 0.17

A 3-phase to ground fault is occurred at the receiving end of the branch No. 1100 at 0.10 [sec]. This fault is cleared by opening the branch No. 1100 (3-phase) at 0.17 [sec]. This simulation is finished at 20.0 [sec].

Branch Opening (Fault Cleared) Branch No. R : Receiving End S : Sending End

END of Sequence Data ABC-phase (3-phase) Ground Fault

The following part is omitted.