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NOTE  SUPPLEMENTARY EQUATIONS
NOTE
147   S     FOR.K=(.22)(F.K)/(.32*F.K+SO.K+IO.K)
148   S     FOI.K=IO.K/(.32*F.K+SO.K+IO.K)
149   S     FOS.K=SO.K/(.22*F.K+SO.K+IO.K)
NOTE
NOTE  CONTROL CARDS FOR SIMULATION
NOTE
SPEC  DT=.5/LENGTH=2100
C     PYEAR=1975
N     TIME=1900
151   A     PLTPER.K=STEP(PLP,PLIT)
C     PLP=5
C     PLIT=1900
C     PRP=0
152   A     PRTPER.K=STEP(PRP,PRIT)+STEP(-PRP,PRTT)
C     PRIT=1900
C     PRTT=2100
PLOT  NRFR=R(0,1)/IOPC=I,FPC=F(0,1000)/POP=P(0,16E9)/PPOLX=X(0,32)
X     /CBR=B,CDR=D(0,50)
RUN   STANDARD
NOTE
NOTE  PARAMETER AND STRUCTURAL CHANGES FOR THE WORLD3 RUNS
NOTE
NOTE  HISTORICAL RUNS
NOTE
C     LENGTH=1970
C     PLP=2
PLOT  POP=P(0,4E9)/CBR=B,CDR=D(0,50)/LE=L(0,60)/
X     LMF=F,LMP=X,LMHS=H,LMC=C(.75,1.75)/TF=T,DFS=*(0,8)
RUN   FIGURE 7-2: POPULATION STANDARD
C     LENGTH=1970
C     PLP=2
PLOT  IC=C,IO=O(0,4E12)/IOPC=I,SOPC=S(0,400)/
X     FOA=A,FOI=Z,FOS=Y(0,1)
RUN   FIGURE 7-3: CAPITAL STANDARD
C     LENGTH=1970
C     PLP=2
PLOT  F=*(0,2E12)/FPC=F(0,800)/AL=A(0,1.6E9)/LY=Y(0,2000)/
X     AIPH=S(0,80)/LFERT=T(0,800)
RUN   FIGURE 7-4: AGRICULTURE STANDARD
C     LENGTH=1970
C     PLP=2
PLOT  NRUR=U(0,4E9)/NRFR=R,FCAOR=C,PCRUM=P(0,1)
RUN   FIGURE 7-5: RESOURCE STANDARD
C     LENGTH=1970
C     PLP=2
PLOT  PPOIO=I,PFOAO=A,PPOR=G,PPAPR=R(0,2E8)/PPOLX=X(0,1)/
X     AHL=L,LMP=T(0,4)
RUN   FIGURE 7-6: POLLUTION STANDARD
NOTE
NOTE  GLOBAL STANDARD RUNS
NOTE
PLOT  NRFR=R(0,1)/IOPC=I,FPC=F(0,1000)/POP=P(0,16E9)/PPOLX=X(0,32)/
X     CBR=a,CDR=D(0,50)
RUN   FIGURE 7-7: GLOBAL STANDARD
PLOT  FCAOR=C(0,1)/IO=O,TAI=A(0,4E12)/AIPH=S(0,200)/
X     FIOAA=F(0,.2)
RUN   FIGURE 7-8: GLOBAL STANDARD, B
PLOT  LY=Y(0,4000)/AL=A(0,4E9)/FPC=F(0,800)/LMF=L(0,1.6)/
A     POP=P(0,16E9)
RUN   FIGURE 7-9: GLOBAL STANDARD, C
NOTE
NOTE  SENSITIVITY TESTS
NOTE
C     NRI=2E12
PLOT  NRFR=R(0,1)/IOPC=I,FPC=F(0,1000)/POP=P(0,16E9)/PPOLX=X(0,32)/
X     CBR=a,CDR=D(0,50)
RUN   FIGURE 7-10: DOUBLE RESOURCES
C     NRI=1E13
RUN   FIGURE 7-11: TEN TIMES RESOURCES
T     FIOAA1T=.5/.3/.1/0/0/0
T     FIOAA2T=.5/.3/.1/0/0/0
RUN   FIGURE 7-13: NEW FIOAA
C     ALIC1=21
C     ALIC2=21
RUN   FIGURE 7-14: ALIC=21 YEARS
C     ALIC1=21
C     ALIC2=21
C     ICOR1=3.75
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C     ICOR2=3.75
RUN   FIGURE 7-15: ALIC=21 YEARS, ICOR=3.75 YEARS
NOTE
NOTE  TECHNOLOGICAL POLICY RUNS
NOTE
NOTE  RUNS SIMULATING DISCRETE CHANGES IN TECHNOLOGIES
NOTE
T     FCAOR2T=1/.2/.1/.05/.05/.05/.05/.05/.05/.05
RUN   FIGURE 7-16: EXPLORATION TECHNOLOGIES
T     FCAOR2T=1/.2/.1/.05/.05/.05/.05/.05/.05/.05
C     NRUF2=.125
RUN   FIGURE 7-18: RECYCLING TECHNOLOGIES
T     FCAOR2T=1/.2/.1/.05/.05/.05/.05/.05/.05/.05
C     NRUF2=.125
T     LYMAP2T=1/1/.98/.95
RUN   FIGURE 7-19: RESOURCE, AIR POLLUTION TECHNOLOGIES
T     FCAOR2T=1/.2/.1/.05/.05/.05/.05/.05/.05/.05
C     NRUF2=.125
T     LYMAP2T=1/1/.98/.95
C     PPGF2=.1
PLOT  NRFR=R(0,1)/IOPC=I(0,2000)/FPC=F(0,1000)/
X     POP=P(0,16E9)/PPOLX=X(0,32)/CBR=B,CDR=D(0,50)
RUN   FIGURE 7-20: RESOURCE, POLLUTION TECHNOLOGIES
T     FCAOR2T=1/.2/.1/.05/.05/.05/.05/.05/.05/.05
C     NRUF2=.125
T     LYMAP2T=1/1/.98/.95
C     PPGF2=.1
C     LYF2=2
PLOT  NRFR=R(0,1)/IOPC=I(0,2000)/FPC=F(0,1000)/
X     POP=P(0,16E9)/PPOLX=X(0,32)/CBR=B,CDR=D(0,50)
RUN   FIGURE 7-21: RESOURCE, POLLUTION, YIELD TECHNOLOGIES
T     FCAOR2T=1/.2/.1/.05/.05/.05/.05/.05/.05/.05
C     NRUF2=.125
T     LYMAP2T=1/1/.98/.95
C     PPGF2=.1
C     LYF2=2
T     LLMY2T=1.2/1/.9/.8/.75/.7/.67/.64/.62/.6
PLOT  NRFR=R(0,1)/IOPC=I(0,8000)/FPC=F(0,1000)/
X     POP=P(0,16E9)/PPOLX=X(0,32)/CBR=B,CDR=D(0,50)
RUN   FIGURE 7-22: RESOURCE, POLLUTION, AGRICULTURAL TECHNOLOGIES
NOTE
NOTE  RUN SIMULATING EXPONENTIALLY GROWING TECHNOLOGIES
NOTE
NOTE  ** THE FOLLOWING CHANGES MUST BE MADE IN EDIT MODE:
NOTE  ** IN ORDER TO MODEL EXPONENTIALLY GROWING TECHNOLOGIES...
NOTE  ** ...CHANGE:
NOTE  ** A NRUF.K=CLIP(NRUF2.K,NRUF1,TIME.K,PYEAR)
NOTE  ** A PPGF.K=CLIP(PPGF2.K,PPGF1,TIME.K,PYEAR)
NOTE  ** A LYF.K=CLIP(LYF2.K,LYF1,TIME.K,PYEAR)
NOTE  ** A NRUF2.K=EXP(-EXPON.K)
NOTE  ** A PPGF2.K=EXP(-EXPON.K)
NOTE  ** A LYF2.K=EXP(EXPON.K)
NOTE  ** A LLMY.K=CLIP(LLMY2.K,LLMY1.K,TIME.K,PYEAR)+(1-EXP(-EXPON.K))
NOTE  ** A ULLR.K=ULPC.K*POP.K*EXP(-EXPON.K)
NOTE  ** ...INSERT:
NOTE  ** A EXPON.K=CLIP(ALPHA*(TIME.K-PYEAR),0,TIME.K,PYEAR)
NOTE  ** C ALPHA=.04
T     LYMAP2T=1/1/.98/.95
T     CUFT=1/1/1/1/1/1
C     DT=.1
PLOT  NRFR=R(0,1)/IOPC=I,FPC=F(0,1000)/POP=P(0,16E9)/PPOLX=X(0,32)/
X     CBR=a,CDR=D(0,50)
RUN   FIGURE 7-23: EXPONENTIALLY GROWING TECHNOLOGIES
NOTE
NOTE  RUNS SIMULATING ADAPTIVE CHANGES IN TECHNOLOGY
NOTE
NOTE  ** THE FOLLOWING CHANGES MUST BE MADE IN EDIT MODE:
NOTE  ** IN ORDER TO MODEL RESOURCE CONTROL...
NOTE  ** ...CHANGE:
NOTE  ** A NRUF.K=CLIP(NRUF2.K,NRUF1,TIME.K,PYEAR)
NOTE  ** L NRUF2.K=NRUF2.J+(DT)(NRATE.JK)
NOTE  ** ...INSERT:
NOTE  ** N NRUF2=1
NOTE  ** R NRATE.KL=CLIP(NRUF2.K*NRCM.K,0,TIME.K,PYEAR)
NOTE  ** A NRCM.K=TABHL(NRCMT,1-NRUR.JK/DNRUR,-1,0,1)
NOTE  ** T NRCMT=--.05/0
NOTE  ** C DNRUR=2E9
NOTE  ** IN ORDER TO MODEL YIELD CONTROL...
NOTE  ** ...CHANGE:
NOTE  ** A LYF.K=CLIP(LYF2.K,LYF1,TIME.K,PYEAR)
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