X-12-ARIMA Quick Reference for DOS
Version 0.3
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Running X-12-ARIMA on a single series:

{*path1*\}x12a {-i} {*path2*\}filename

where:

{*-i*} :	optional flag that informs X-12-ARIMA that the named file is an input specification file
{*path2*\} filename.spc :	input specification file
{*path2*\} filename.out :	main output file
{*path2*\} filename.err :	error file
{*path1*\} :	path information for the X-12-ARIMA program (optional)
{*path2*\} :	path information for the X-12-ARIMA input file (optional)

Example:

```
c:\x12arima\x12a b:\sales\retail
```

Notes:

(a) Only the filename (and path, if necessary) is specified, not the extension.
(b) The program uses this filename to form the filename of other files generated by the program.

Running X-12-ARIMA on a single series with an alternate output name:

{*path1*\}x12a {-i} {*path2*\}filename1 {-o} {*path3*\}filename2

where:

{*-i*} :	optional flag that informs X-12-ARIMA that the named file is an input specification file
{*path2*\} filename1.spc :	input specification file
{*-o*} :	optional flag that informs X-12-ARIMA that the named file is to be used to form the output files
{*path3*\} filename2.out :	main output file
{*path3*\} filename2.err :	error file
{*path1*\} :	path information for the X-12-ARIMA program (optional)
{*path2*\} :	path information for the X-12-ARIMA input file (optional)
{*path3*\} :	path information for the X-12-ARIMA output file (optional)

Example:

```
c:\x12arima\x12a b:\sales\retail b:\sales\retail2
```

Notes:

(a) Only the filename (and path, if necessary) is specified, not the extension.
(b) The program uses the alternate filename to form the filename of other files generated by the program.

Handling spaces in file names for a single series:

{*path1*\}x12a {-i} "{*path2*\}filename"

where:

{*path2*\} filename.spc :	input specification file, enclosed in quotation marks (")
{*path1*\} :	path information for the `X-12-ARIMA` program (optional)
{*path2*\} :	path information for the `X-12-ARIMA` input file (optional)

Example:

```
c:\x12arima\x12a "b:\US sales\NE retail"
```

Notes:

(a) The opening and closing quotation marks must fully contain the filenames with no extra spaces.
(b) Quotation marks can be used to handle spaces in the alternate output filename as well.

Running X-12-ARIMA on more than one series (a spec file for every series):

{*path1*\}x12a -m {*path2*\}metafile

where:

-m :	flag that informs X-12-ARIMA that the named file is a metafile
{*path2*\} metafile.mta :	input metafile
{*path2*\} metafile.log :	log file, which gives a summary of all the runs for a given metafile
{*path1*\} :	path information for the X-12-ARIMA program (optional)
{*path2*\} :	path information for the X-12-ARIMA metafile (optional)

Example:

```
c:\x12arima\x12a -m b:\sales\allsales
```

Notes:

(a) Only the filename (and path, if necessary) for the metafile is specified, not the extension
(b) The metafile must have one or two filenames (without extension) per line, separated by a tab or blank spaces. The first filename is the filename of an input specification file. The second (if specified) is the filename used to form the filenames of the output files for the run specified by the corresponding input selection file.
(c) If only one filename is given on a particular line, the filename of the input specification file is used to generate the names of the output files.
(d) Up to 500 input files can be specified in a single metafile.

Running X-12-ARIMA on more than one series (one spec file run on many series):

{*path1*\}x12a {*-i*} {*path2*\}filename -d {*path3*\}metafile

where:

{*-i*} :	optional flag that informs X-12-ARIMA that the named file is an input specification file
{*path2*\} filename.spc :	input specification file
-d :	the flag that informs X-12-ARIMA that the named file is a data metafile
{*path3*\} metafile.dta :	data metafile
{*path3*\} metafile.log :	log file, which gives the summary of all the runs for a given metafile
{*path1*\} :	path information for the X-12-ARIMA program (optional)
{*path2*\} :	path information for the X-12-ARIMA input file (optional)
{*path3*\} :	path information for the X-12-ARIMA data metafile (optional)

Example:

```
c:\x12arima\x12a sales -d b:\sales\alldata
```

Notes:

(a) Only the filename (and path, if necessary) for the data metafile is specified, not the extension.

(b) The metafile must have one or two filenames per line, separated by a tab or blank spaces. The first filename is the name of a data file (including the file extension). The second (if specified) is the filename (without extension) used to form the filenames of the output files for the run specified by the corresponding input specification file.

(c) If only one filename is given on a particular line, the filename of the data file is used to generate the names of the output files.

(d) The X-12-ARIMA options given in the input specification file are applied to the data read in from each of the files given in the data metafile.

(e) Up to 500 data files can be specified in a single data metafile.

Handling spaces in file names for a metafile run

{*path1*\}x12a -m " {*path2*\} metafile "

where:

-m :	flag that informs `X-12-ARIMA` that the named file is a metafile
{*path2*\} metafile.mta :	input metafile, enclosed in quotation marks (")
{*path1*\} :	path information for the `X-12-ARIMA` program (optional)
{*path2*\} :	path information for the `X-12-ARIMA` metafile (optional)

Examples:

```
c:\x12arima\x12a -m "c:\US sales\all sales"
```

```
c:\x12arima\x12a "airline model" -d "c:\US sales\all sales data"
```

Notes:

(a) Filenames within the metafile or data metafile can also be surrounded by quotes if they have spaces imbedded in the name of the file.

(b) The opening and closing quotation marks must fully contain the filenames with no extra spaces, and that there are matching opening and closing quotation marks for each file.

(c) All other rules for constructing and running metafiles are the same.

Other options declared at time of execution:

-a : Accessible output - generate codes that are used by the `cnvout2html` utility to generate accessible HTML output
-c : Sum each of the components of a composite adjustment, but only perform modelling or seasonal adjustment on the total.
-g dirname : Store graphics metafile and related files for external graphics in the *dirname* directory.
-n : (No tables) Print only the tables specifically requested in the input specification file.
-p : Turn off pagination in the main output file.
-q : Run X-12-ARIMA in "quiet" mode (warning messages not sent to console).
-r : Use reduced output format for table formats and headers.
-s : Store seasonal adjustment and regARIMA model diagnostics in a file.
-v : Check input specification file(s) for errors only; no other processing.
-w : Use wide (132 character) format in main output file.

Examples:

```
c:\x12arima\x12a -i b:\trade\imports -o b:\trade\importsRun2 -a -s
   c:\x12arima\x12a b:\trade\imports b:\trade\importsRun2 -a -s
c:\x12arima\x12a -m "g:\EU trade\all exports" -g "g:\EU trade\graph" -q -r
```

Notes:

(a) The first two examples are equivalent; when the input specification file is given as the first argument, the -i flag is assumed. When the alternate output filename is given as the second argument, the -o flag is assumed.
(b) Options can entered in any order (ie, -n -s is treated the same as -s -n).
(c) The -v flag should not be used with the -s, -c, -n, -w, -r, -q or -p flags. A warning message will be generated.
(d) The -c flag can only be used with the -m flag.
(e) The -m flag cannot be used with the -d flag.
(f) The -i flag cannot be used with the -m flag.
(g) The -o flag cannot be used with the -m and -d flags.
(h) The -a flag invokes the -w and -p flags.
(i) Quotation marks can be used for all filenames that have spaces.

Specs and arguments for the input specification file

Notes:

(a) Every input specification file must have either a `series` spec or a `composite` (for runs where a composite seasonal adjustment is performed) spec.
(b) The first spec in any input specification file must be either a `series`, `composite`, or `metadata` spec. If the `metadata` spec is the first spec in the input specification file, then the second spec must be either the `series` or `composite` spec.
(c) The `series` and `composite` specs cannot be used in the same input file.
(d) For the arguments given below, when two or more values are connected by the symbol |, only one of the values can be assigned to the argument in a given run.
(e) Dates are specified as either *year.month* for monthly data or *year.quarter* for quarterly data. For monthly series, the months can be denoted either by integers (1 to 12) or by month abbreviations (`jan, feb, mar, apr, may, jun, jul, aug, sep, oct, nov, dec`). For quarterly series, only integers (1 to 4) are allowed. A zero can be placed in front of integers from 1 to 9 for padding (for example, `2002.02` is an acceptable date specification for February 2002).
(f) Anything on a line after a number sign (#) is considered a comment and is ignored by the program.
(g) Spec names, arguments, keywords, and dates are not case sensitive. For example, `SeasonalMA` and `seasonalma` are treated the same by `X-12-ARIMA`

(h) Multiple arguments must be enclosed in parentheses. If an argument accepts multiple values but only one is given, then the parentheses are optional. If an argument accepts only a single value, the value must not be enclosed in parentheses.

(i) Either double or single quotation marks are acceptable for character arguments.

(j) The `data` and `file` arguments cannot be used in the same spec.

(k) The `data` and `format` arguments cannot be used in the same spec.

(l) Only one of the `automdl`, `pickmdl` and `arima` specs can be used in the same input file.

(m) Change of regime regression variables can be specified for seasonal `(seasonal)`, trigonometric seasonal `(sincos)`, trading day `(td, tdnolpyear, td1coef, td1nolpyear, or tdstock)`, length-of-month `(lom)`, length-of-quarter `(loq)`, or leap year `(lpyear)` regression variables. When a change of regime is specified for one of these regression variables, the program will add an additional set of regression variables that is defined as usual before the date of the change of regime, and set to zero for those observations on or after the change of regime date. A change of regime regression variable is specified by appending a valid date surrounded by slashes to the name of a regression variable in the `variables` argument of the `regression` spec. For example, to specify a change of regime in trading day starting June of 1985, put `td/1985.jun/` in the `variables` argument of the `regression` spec.

(n) `X-12-ARIMA` will extend the series with one year of forecasts prior to seasonal adjustment whenever a regARIMA model is specified with no **forecast** spec. The only way to specify a seasonal adjustment without forecast extension when a regARIMA model is specified is to set `maxlead = 0` in the **forecast** spec.

(o) The `function` and `power` arguments cannot be used together in the `transform` spec.

(p) The `x11regression` spec cannot be used for a series with missing data.

(q) The `b` argument in the `regression` and `x11regression` specs must appear **after** the `variables` and `user` arguments.

(r) When `0.per` is entered for the ending date of the `modelspan` argument of the `series` or `composite` specs, the ending date of the model span will be set to be the final occurrence of the period `per` in the span of data analyzed (ie, `modelspan=(1980.jan,0.dec)` will set the ending date of the model span to the last December of the data).

(s) The `diff` and `maxdiff` arguments in the `automdl` specs cannot be used in the same input file; if they are found in the same file, only the values of `maxdiff` will be used.

(t) The `period` argument of the `series` and `composite` specs can be any number up through 12, but only 12 and 4 are allowed when performing a seasonal adjustment of the series.

(u) Arguments which have been designated **Rarely Used Options** in the main documentation are given at the end of each spec, with a "#" as the first character of the line.

INDIVIDUAL SPECS (with starting page number in main documentation)

INDIVIDUAL SPECS

```
arima{
  ar = (initial coefficients for AR, or fixed values with suffix f, e.g. -.6f)
  ma = (initial coefficients for MA, or fixed values with suffix f, e.g. -.6f)
  model = (p d q)(P D Q)
  title = "    "
}

automdl{
  acceptdefault = yes | no { default : no }
  diff = (regular differencing order, seasonal differencing order)
  ljungboxlimit = number { default : 0.95 }
  maxdiff = (maximum regular differencing order, maximum seasonal differencing order) { default: (2,1) }
  maxorder = (maximum nonseasonal ARMA order, maximum seasonal ARMA order) { default: (2,1) }
  mixed = yes | no { default : yes }
  print = See Table 1 for list of table names
  savelog = See Table 2 for list of diagnostics
  armalimit = limit for t-statistics of ARMA coefficients { default : 1.0 }
#   balanced = yes | no { default : no }
#   hrinitial = yes | no { default : no }
#   reducecv = amount of reduction for outlier critical value { default : 0.14286 }
#   urfinal = limit for the final unit root test { default : 1.05 }
}

check{
  maxlag = number of acf's to print
      { default: 24 for monthly series, 8 for quarterly series }
  print = See Table 1 for list of table names
  save = See Table 1 for list of table names
  savelog = See Table 2 for list of diagnostics
}

composite{
  appendbcst = yes | no { default: no }
  appendfcst = yes | no { default: no }
  decimals = 0 number of output decimals, must be an integer from 0 to 5, inclusive
  modelspan = ( startdate, enddate )
      { default: starting, ending date of the aggregated series }
  name = "    "
  print = See Table 1 for list of table names
  save = See Table 1 for list of table names, and Table 3 for a list of tables
      that can be saved as percentages
  savelog = See Table 2 for list of diagnostics
  spectrumstart = date { default: 96 observations before end of span, start of span if length of series < 96 }
  title = "    "
#   diffspectrum = yes | no { default: yes }
#   maxspecar = 20 { maximum order of the AR spectrum, default : 30 for monthly series,
#       10 for quarterly series }
#   peakwidth = 2 { width of spectral peak, default : 1 }
#   saveprecision = 10 { number of decimals in save tables, must be integer from 1 to 15 }
#   spectrumseries = original | a1 | outlieradjoriginal | a19 | adjoriginal | b1 | modoriginal | e1
#       { default: original }
#   spectrumtype = arspec | periodogram { default: arspec }
#   yr2000 = yes | no { default: yes }
}
```

estimate{
  exact = ma | arma | none { default: exact m.l.e. for all coefficients }
  maxiter = maximum number of iterations { default: 1500 }
  outofsample = yes | no { default: no }
  print = See Table 1 for list of table names
  save = See Table 1 for list of table names
  savelog = See Table 2 for list of diagnostics
  tol = convergence tolerance { default: 10e-5 }
# file = " "
# fix = nochange | all | arima | reg | none { default: nochange }
}

force{
  lambda = Value of the parameter λ used to determine the weight matrix C for the regression method
    of forcing the totals of the seasonally adjusted series { $-3.0 \leq \lambda \leq 3$, default: 0.0 }
  mode = ratio — diff { default: ratio }
  print = See Table 1 for list of table names
  rho = Value of the AR(1) parameter (ρ) used in the regression method { $0.0 \leq \rho \leq 1.0$,
    default: $0.9^{12/Ny}$, where Ny is the seasonal period (12 for monthly series, 4 for quarterly) }
  round = yes | no { default: no }
  save = See Table 1 for list of table names, and
      Table 3 for a list of tables that can be saved as percentages
  start = month or quarter when forcing starts { default: 1st month or quarter }
  target = original — caladjust — permprioradj — both { default: original }
  type = no | denton | regress { default: no }
  usefcst = yes | no { default: yes }
# indforce = yes | no { default: yes }
}

forecast{
  exclude = number of observations to drop before starting forecasts { default: 0 }
  maxback = how many backcasts { default: 0 }
  maxlead = how many forecasts { default: one year }
  print = See Table 1 for list of table names
  probability = coverage probability of prediction intervals, assuming normality { default: 0.95 }
  save = See Table 1 for list of table names
}

history{
  endtable = ending date of tables for seasonal adjustment revisions histories
  estimates = (sadj sadjchng trend trendchng seasonal aic fcst)
  fixmdl = yes | no { default: model is restimated every time }
  fixreg = (td holiday user outlier)
  fstep = vector of forecast leads for the out-of-sample forecasts and MSE's { default: (1,period) }
  print = See Table 1 for list of table names
  sadjlags = vector of target lags for revisions history of the seasonally adjusted series
  save = See Table 1 for list of table names
  savelog = See Table 2 for list of diagnostics
  start = starting date of revision history
  target = concurrent | final { default: final }
  trendlags = vector of target lags for revisions history of the trend component
# additivesa = percent | difference { default: difference }
# fixx11reg = yes | no { default: no }
# refresh = yes | no { default: no }
# outlier = (keep | remove auto) { default: keep }
# outlierwin = number of observations to test for outliers { default: one year }
# x11outlier = yes | no { default: yes }
}

identify{
  diff = (orders of nonseasonal differencing)
  maxlag = number of acf's and pacf's to print { default: 36 for monthly series, 12 for quarterly series }
  print = See Table 1 for list of table names
  save = See Table 1 for list of table names
  sdiff = (orders of seasonal differencing)
}

metadata{
  keys = (keys for user-defined metadata)
  values = (corresponding values for user-defined metadata)
}

outlier{
  critical = critical value for outlier testing | ($critical_{AO}, critical_{LS}, critical_{TC}$) { default: see Table 4 }
  lsrun = number of successive level shifts to test { default: 0 }
  method = addone | addall { default: addone }
  print = See Table 1 for list of table names
  save = See Table 1 for list of table names
  span = (*startdate, enddate*)
  types = none | ao | ls | tc | all { default: (ao ls) }
  tcrate = number between 0 and 1 { default: 0.70 * (12 / period) }
}

pickmdl{
  bcstlim = limit for average backcast error { default: 18.0 }
  fcstlim = limit for average forecast error { default: 15.0 }
  file = " " { default: five models given in Table 5 }
  identify = all | first { default: first }
  method = first | best { default: first }
  mode = both | fcst { default: fcst }
  outofsample = yes | no { default: no }
  overdiff = limit for overdifferencing { default: 0.9 }
  print = See Table 1 for list of table names
  qlim = limit for probability of Ljung-Box Q { default: 5.0 }
  savelog = See Table 2 for list of diagnostics
}

regression{
  aicdiff = difference needed for AIC-based test to accept regressor { default: 0.0 }
  aictest = (td | tdnolpyear | td1coef | td1nolpyear | tdstock easter user)
  data = ( )
  file = " "
  format = "(*valid FORTRAN format*)" | "datevalue" | "datevaluecomma" | "free" |
      "freecomma" | "x12save" { default: "free" }
  print = See Table 1 for list of table names
  save = See Table 1 for list of table names
  savelog = See Table 2 for list of diagnostics
  start = *date* { default: the beginning of the series }
  user = (names of user-defined regression variable(s))
  usertype = (constant seasonal td lpyear lom loq tdstock
      easter sceaster thanks labor holiday ao ls rp tc user)
  variables = (seasonal | sincos[1 to period/2] td | tdnolpyear | td1coef | td1nolpyear | tdstock[1 to 31]
      lpyear | loq | lom easter[1 to 25] | sceaster[1 to 25] labor[1 to 25] thank[-8 to 17]
      ao*date* ls*date* tc*date* rp*date-date* const)
# b = (initial coefficients for regressors, or fixed values with suffix f, e.g. -.6f)
# centeruser = mean | seasonal { default: user-defined regressors are not centered }
# eastermeans = yes | no { default: yes }
# noapply = (td ao ls tc holiday userseasonal user)
# tcrate = number between 0 and 1 { default: 0.70 * (12 / period) }
}

```
series{
  appendbcst = yes | no { default: no }
  appendfcst = yes | no { default: no }
  comptype = none | add | sub | mult | div { default: none }
  compwt = any number >0 { default: 1 }
  data = ( )
  decimals = 0 { number of output decimals, must be an integer from 0 to 5, inclusive }
  file = "     "
  format = "( valid FORTRAN format )" | "1r" | "2r" | "1l" | "2l" | "2l2" | "cs" | "cs2" |
       "datevalue" | "datevaluecomma" | "free" | "freecomma" | "tramo" | "x12save"    { default: "free" }
  modelspan = ( startdate, enddate ) { default: starting, ending date of span }
  name = ”     ”
  period = 12 | 4 { default: 12 }
  precision = 0 { number of input decimals, must be an integer from 0 to 5, inclusive }
  print = See Table 1 for list of table names
  save = See Table 1 for list of table names
  savelog = See Table 2 for list of diagnostics
  span = ( startdate, enddate )
  spectrumstart = date { default: 96 observations before end of span, start of span if length of series < 96 }
  start = date
  title = "     " { default: "X-12-ARIMA run for name" }
#   diffspectrum = yes | no { default: yes }
#   divpower = 4 { rescale series by power of 10, must be integer from -9 to 9 }
#   maxspecar = 20 { maximum order of the AR spectrum, default : 30 for monthly series,
#        10 for quarterly series }
#   missingcode = any number  default: -99999.
#   peakwidth = 2 { width of spectral peak, default : 1 }
#   saveprecision = 10 { number of decimals in save tables, must be integer from 1 to 15 }
#   spectrumseries = original | a1 | outlieradjoriginal | a19 | adjoriginal | b1 | modoriginal | e1
#        { default: original }
#   spectrumtype = arspec | periodogram { default: arspec }
#   trimzero = yes | no | span { default: yes }
#   yr2000 = yes | no { default: yes }
}
slidingspans{
  cutchng = any number >0 { default: 3.0 }
  cutseas = any number >0 { default: 3.0 }
  cuttd = any number >0 { default: 2.0 }
  fixmdl = yes | no | clear { default: yes (model is fixed every span) }
  fixreg = ( td    holiday    user    outlier )
  length = length of sliding span { default: selected by program }
  numspans = number of sliding spans { default: selected by program }
  outlier = yes | keep | remove { default: keep }
  print = See Table 1 for list of table names
  save = See Table 1 for list of table names
  savelog = See Table 2 for list of diagnostics
  start = starting date of ss comparisons { default: selected by program }
#   additivesa = percent | difference { default: difference }
#   fixx11reg = yes | no { default: yes }
#   x11outlier = yes | no { default: yes }
}
```

```
transform{
  adjust = lom | loq | lpyear
  aicdiff = AICC difference needed to accept no transformation { default: 2.0 }
  data = ( )
  file = "     "
  format = "( valid FORTRAN format )" | "1r" | "2r" | "1l" | "2l" | "2l2" | "cs" | "cs2" |
       "datevalue" | "datevaluecomma" | "free" | "freecomma" | "tramo" | "x12save"    { default: "free" }
  function = none | log | sqrt | inverse | logistic | auto { default: none }
  mode = percent | ratio | diff
  name = "     "
  power = power for Box-Cox power transformation { default: no transformation }
  precision = 0 { number of input decimals, must be an integer from 0 to 5, inclusive }
  print = See Table 1 for list of table names
  save = See Table 1 for list of table names
  savelog = See Table 2 for list of diagnostics
  start = date { default: beginning of the series }
  title = "     "
  type = temporary | permanent
#    trimzero = yes | no | span { default: yes }
}

x11 {
  appendbcst = yes | no { default: no }
  appendfcst = yes | no { default: no }
  final = ao | ls | tc | user { default: all listed effects kept in final seasonally adjusted series }
  mode = mult | add | logadd | pseudoadd { default: mult }
  print = See Table 1 for list of table names
  save = See Table 1 for list of table names, and
       Table 3 for a list of tables that can be saved as percentages
  savelog = See Table 2 for list of diagnostics
  seasonalma = x11default | s3x1 | s3x3 | s3x5 | s3x9 | s3x15 | stable | msr { default: msr }
  sigmalim = (1.5 2.5) | (lower and upper sigma limits, both > 0)
  title = "     "
  trendma = any odd number less than or equal to 101 { default: automatic trend selection }
  type = sa | summary | trend { default: sa }
#    calendarsigma = all | signif | select | none { default: none }
#    centerseasonal = yes | no { default: no }
#    excludefcst = yes | no { default: no }
#    keepholiday = yes | no { default: no }
#    print1stpass = yes | no { default: no }
#    sfshort = yes | no { default: no }
#    sigmavec = list of months to be grouped together when calendarsigma = select
#    spectrumaxis = same | diff { default: diff }
#    trendic = any number > 0 { default : depends on what is entered for trendma }
#    true7term = yes | no { default: no }
}
```

```
x11regression {
   aicdiff = difference needed for AIC-based test to accept regressor { default: 0.0 }
   aictest = (td | td1coef | tdstock    easter    user)
   critical = critical value for AO outlier testing
         { default: depends on length of span, see Table 3 }
   data = ( )
   file = "     "
   format = "( valid FORTRAN format )" | "datevalue"| "datevaluecomma" | "freecomma"
         | "free" | "tramo" | "x12save" { default: "free" }
   outliermethod = addone | addall { default: addone }
   outlierspan = (startdate, enddate )
   print = See Table 1 for list of table names
   prior = yes | no { default: no }
   save = See Table 1 for list of table names
   savelog = See Table 2 for list of diagnostics
   sigma = any number > 0 { default: 2.5 }
   span = ( startdate, enddate ) { default: starting, ending date of span }
   start = date { default: the begining of the series }
   tdprior = (td weight for each day of week) { default: no prior trading day }
   user = (names of user-defined regression variable(s))
   usertype = ( td    tdstock    ao    holiday    easter    labor    thanks    user )
   variables = (td | td1coef | tdstock[1 to 31]    aodate    easter[1 to 25] | sceaster[1 to 25]
         labor[1 to 25]    thank[-8 to 17] )
#    b = (initial coefficients for regressors, or fixed values with suffix f, e.g. -.6f)
#    centeruser = mean | seasonal { default: user-defined regressors are not centered }
#    eastermeans = yes | no { default: yes }
#    forcecal = yes | no { default: no }
#    noapply = (td    holiday)
#    reweight = yes | no { default: no }
#    umdata = ( ) { user-defined mean to be removed from irregular }
#    umfile = "     " { file containing user-defined mean to be removed from irregular }
#    umformat = "( valid FORTRAN format )" | "1r" | "2r" | "1l" | "2l" | "2l2" | "cs" | "cs2" |
#          "datevalue" | "datevaluecomma" | "free" | "freecomma" | "tramo" | "x12save"
#          { default: "free" }
#    umname = "     " { name of the user-defined mean }
#    umprecision = 0
#          { number of input decimals, must be an integer from 0 to 5, inclusive }
#    umstart = date { default: the begining of the series }
#    umtrimzero = yes | no | span { default: yes }
}
```

Table 1: **Tables printed or saved by X-12-ARIMA**

Name	Abbrev.	Save Table?	Brief	Default	Spec
autochoice	ach		+	+	automdl
autochoicemdl	amd				automdl
autodefaulttests	adt				automdl
autofinaltests	aft				automdl
autoljungboxtest	alb				automdl
bestfivemdl	b5m				automdl
header	hdr		+	+	automdl
unitroottest	urt		+	+	automdl
unitroottestmdl	urm				automdl
acf	acf	+		+	check
acfplot	acp			+	check
acfsquared	ac2	+		+	check
acfsquaredplot	ap2			+	check
histogram	hst			+	check
normalitytest	nrm			+	check
pacf	pcf	+			check
pacfplot	pcp				check
specresidual	spr	+		+	check
adjcompositeplot	b1p				composite
adjcompositesrs	b1	+	+	+	composite
calendaradjcomposite	cac	+			composite
compositeplot	cmp				composite
compositesrs	cms	+	+	+	composite
header	hdr		+	+	composite
indadjsatot	iaa	+	+	+	composite
indadjustfac	iaf	+		+	composite
indadjustmentratio	i18	+			composite
indaoutlier	iao	+		+	composite
indcalendar	ica	+		+	composite
indcalendaradjchanges	ie8	+		+	composite
indforcefactor	iff	+	+	+	composite
indftestd8	idf			+	composite
indirregular	iir	+		+	composite
indirregularplot	iip				composite
indlevelshift	ils	+		+	composite
indmcdmovavg	if1	+			composite
indmodirr	ie3	+			composite
indmodoriginal	ie1	+			composite
indmodsadj	ie2	+			composite
indmovseasrat	ims			+	composite
indqstat	if3		+	+	composite
indreplacsi	id9			+	composite
indresidualseasf	irf			+	composite
indrevsachanges	i6a	+		+	composite
indrndsachanges	i6r	+		+	composite
indrobustsa	iee	+			composite
indsachanges	ie6	+		+	composite
indsadjround	irn	+	+	+	composite
indseasadj	isa	+	+	+	composite
indseasadjplot	iap				composite
indseasonal	isf	+	+	+	composite
indseasonaldiff	isd	+	+	+	composite
indseasonalplot	isp				composite
indtest	itt		+	+	composite
indtotaladjustment	ita	+			composite
indtrend	itn	+		+	composite

Table 1: X-12-ARIMA Tables (continued)

Name	Abbrev.	Save Table?	Brief	Default	Spec
indtrendchanges	ie7	+		+	composite
indtrendplot	itp				composite
indunmodsi	id8	+		+	composite
indx11diag	if2		+	+	composite
indyrtotals	ie4	+			composite
origchanges	ie5	+		+	composite
origwindsaplot	ie0				composite
outlieradjcomposite	oac	+			composite
prioradjcomposite	ia3	+			composite
ratioplotindsa	ir2				composite
ratioplotorig	ir1				composite
speccomposite	is0	+	+	+	composite
specindirr	is2	+	+	+	composite
specindsa	is1	+	+	+	composite
armacmatrix	acm	+			estimate
averagefcsterr	afc			+	estimate
estimates	est	+	+	+	estimate
iterationerrors	ite				estimate
iterations	itr	+			estimate
lformulas	lkf				estimate
lkstats	lks	+	+	+	estimate
model	mdl	+	+	+	estimate
options	opt			+	estimate
regcmatrix	rcm	+			estimate
regressioneffects	ref	+			estimate
residuals	rsd	+			estimate
roots	rts	+			estimate
forcefactor	ffc	+	+	+	force
revsachanges	e6a	+		+	force
rndsachanges	e6r	+		+	force
saround	rnd	+	+	+	force
seasadjtot	saa	+	+	+	force
backcasts	bct	+			forecast
forecasts	fct	+		+	forecast
transformed	ftr	+		+	forecast
transformedbcst	btr	+			forecast
variances	fvr	+			forecast
chngestimates	che	+			history
chngrevisions	chr	+		+	history
chngsummary	chs		+	+	history
fcsterrors	fce	+	+	+	history
fcsthistory	fch	+			history
header	hdr		+	+	history
indsaestimates	iae	+			history
indsarevisions	iar	+		+	history
indsasummary	ias		+	+	history
lkhdhistory	lkh	+	+	+	history
outlierhistory	rot	+	+	+	history
saestimates	sae	+			history
sarevisions	sar	+		+	history
sasummary	sas		+	+	history
sfestimates	sfe	+			history
sfilterhistory	sfh	+			history
sfrevisions	sfr	+		+	history
sfsummary	sfs		+	+	history
trendchngestimates	tce	+			history

Table 1: X-12-ARIMA Tables (continued)

Name	Abbrev.	Save Table?	Brief	Default	Spec
trendchngrevisions	tcr	+		+	history
trendchngsummary	tcs		+	+	history
trendestimates	tre	+			history
trendrevisions	trr	+		+	history
trendsummary	trs		+	+	history
acf	iac	+	+	+	identify
acfplot	acp			+	identify
pacf	ipc	+	+	+	identify
pacfplot	pcp			+	identify
regcoefficients	rgc				identify
finaltests	fts	+			outlier
header	hdr			+	outlier
iterations	oit	+			outlier
temporaryls	tls		+	+	outlier
tests	ots				outlier
header	hdr		+	+	pickmdl
pickmdlchoice	pch		+	+	pickmdl
usermodels	umd		+	+	pickmdl
aictest	ats		+	+	regression
aoutlier	ao	+	+	+	regression
dailyweights	tdw				regression
holiday	hol	+	+	+	regression
levelshift	ls	+	+	+	regression
outlier	otl	+	+	+	regression
regressionmatrix	rmx	+			regression
regseasonal	a10	+	+	+	regression
temporarychange	tc	+	+	+	regression
tradingday	td	+	+	+	regression
userdef	usr	+	+	+	regression
adjoriginal	b1	+	+	+	series
adjorigplot	b1p				series
calendaradjorig	a18	+			series
header	hdr		+	+	series
outlieradjorig	a19	+			series
savefile	sav		+	+	series
seriesmvadj	mv	+	+	+	series
seriesplot	a1p				series
span	a1	+	+	+	series
specfile	spc	+	+	+	series
specorig	sp0	+	+	+	series
chngspans	chs	+			slidingspans
factormeans	fmn			+	slidingspans
header	hdr		+	+	slidingspans
indchngspans	cis	+			slidingspans
indfactormeans	fmi		+	+	slidingspans
indpercent	pci		+	+	slidingspans
indsaspans	ais	+			slidingspans
indsfspans	sis	+			slidingspans
indsummary	smi			+	slidingspans
indychngspans	yis	+			slidingspans
indyypercent	piy				slidingspans
indyysummary	siy				slidingspans
percent	pct		+	+	slidingspans
saspans	ads	+			slidingspans
sfspans	sfs	+			slidingspans
ssftest	ssf			+	slidingspans

Table 1: X-12-ARIMA Tables (continued)

Name	Abbrev.	Save Table?	Brief	Default	Spec
summary	sum			+	slidingspans
tdspans	tds	+			slidingspans
ychngspans	ycs	+			slidingspans
yypercent	pcy				slidingspans
yysummary	suy				slidingspans
aictransform	tac		+	+	transform
permprior	a2p	+			transform
permprioradjusted	a3p	+			transform
permprioradjustedptd	a4p	+			transform
prior	a2	+	+	+	transform
prioradjusted	a3	+			transform
prioradjustedptd	a4d	+			transform
seriesconstant	a1c	+	+	+	transform
seriesconstantplot	acp				transform
tempprior	a2t	+			transform
transformed	trn	+			transform
adjoriginalc	c1	+			x11
adjoriginald	d1	+			x11
adjustdiff	fad	+	+	+	x11
adjustfac	d16	+	+	+	x11
adjustmentratio	e18	+			x11
autosf	asf				x11
biasfactor	bcf	+			x11
calendar	d18	+	+	+	x11
calendaradjchanges	e8	+		+	x11
combholiday	chl	+	+	+	x11
extreme	c20	+			x11
extremeb	b20	+			x11
ftestb1	b1f				x11
ftestd8	d8f		+	+	x11
irregular	d13	+		+	x11
irregularadjao	iao	+			x11
irregularb	b13	+			x11
irregularc	c13	+			x11
irregularplot	irp				x11
irrwt	c17	+		+	x11
irrwtb	b17	+			x11
mcdmovavg	f1	+			x11
modirregular	e3	+			x11
modoriginal	e1	+			x11
modseasadj	e2	+			x11
modsic4	c4	+			x11
modsid4	d4	+			x11
movseasrat	d9a			+	x11
origchanges	e5	+		+	x11
origwsaplot	e0				x11
qstat	f3		+	+	x11
ratioplotorig	ra1				x11
ratioplotsa	ra2				x11
replacsi	d9	+		+	x11
replacsib4	b4				x11
replacsib9	b9				x11
replacsic9	c9	+			x11
residualseasf	rsf			+	x11
robustsa	e11	+			x11
sachanges	e6	+		+	x11

Table 1: X-12-ARIMA Tables (continued)

Name	Abbrev.	Save Table?	Brief	Default	Spec
seasadj	d11	+	+	+	x11
seasadjb11	b11	+			x11
seasadjb6	b6	+			x11
seasadjc11	c11	+			x11
seasadjc6	c6	+			x11
seasadjconst	sac	+	+	+	x11
seasadjd6	d6	+			x11
seasadjfcst	saf	+			x11
seasadjplot	sap				x11
seasonal	d10	+	+	+	x11
seasonaladjregsea	ars	+	+	+	x11
seasonalb10	b10	+			x11
seasonalb5	b5	+			x11
seasonalc10	c10	+			x11
seasonalc5	c5	+			x11
seasonald5	d5	+			x11
seasonaldiff	fsd	+	+	+	x11
seasonalplot	sfp				x11
sib3	b3	+			x11
sib8	b8	+			x11
specirr	sp2	+	+	+	x11
specsa	sp1	+	+	+	x11
tdadjorig	c19	+			x11
tdadjorigb	b19	+			x11
tdaytype	tdy		+	+	x11
totaladjustment	tad	+			x11
trend	d12	+		+	x11
trendadjls	tal	+			x11
trendb2	b2	+			x11
trendb7	b7	+			x11
trendc2	c2	+			x11
trendc7	c7	+			x11
trendchanges	e7	+		+	x11
trendconst	tac	+			x11
trendd2	d2	+			x11
trendd7	d7	+			x11
trendfcst	trf	+			x11
trendplot	trp				x11
unmodsi	d8	+		+	x11
unmodsiox	d8b	+			x11
x11diag	f2		+	+	x11
x11easter	h1	+	+	+	x11
yrtotals	e4	+		+	x11
calendar	xca	+	+	+	x11regression
calendarb	bxc	+			x11regression
combcalendar	xcc	+	+	+	x11regression
combcalendarb	bcc	+			x11regression
combtradingday	c18	+	+	+	x11regression
combtradingdayb	b18	+			x11regression
extremeval	c14	+		+	x11regression
extremevalb	b14	+			x11regression
holiday	xhl	+	+	+	x11regression
holidayb	bxh	+			x11regression
outlierfinaltests	xft				x11regression
outlierhdr	xoh			+	x11regression
outlieriter	xoi	+			x11regression

Table 1: X-12-ARIMA Tables (continued)

Name	**Abbrev.**	**Save Table?**	**Brief**	**Default**	**Spec**
outliertests	xot				x11regression
priortd	a4	+	+	+	x11regression
tradingday	c16	+	+	+	x11regression
tradingdayb	b16	+			x11regression
x11reg	c15	+		+	x11regression
x11regb	b15	+			x11regression
xaictest	xat		+	+	x11regression
xregressioncmatrix	xrc	+			x11regression
xregressionmatrix	xrm	+			x11regression

Table 2: **Diagnostics saved to the log file by X-12-ARIMA**

Name	**Abbrev.**	**Spec**	**Name**	**Abbrev.**	**Spec**
automodel	amd	automdl	aveabsrevindsa	iaa	history
autodiff	adf	automdl	aveabsrevsa	asa	history
bestfivemdl	b5m	automdl	aveabsrevsf	asf	history
mean	mu	automdl	aveabsrevsfproj	asp	history
ljungboxq	lbq	check	aveabsrevtrend	atr	history
normalitytest	nrm	check	aveabsrevtrendchng	atc	history
alldiagnostics	all	composite	automodel	amd	pickmdl
indfstabled8	id8	composite	aictest	ats	regression
indicratio	iir	composite	peaks	spk	series
indidseasonal	iid	composite	percent	pct	slidingspans
indm1	im1	composite	percents	pcs	slidingspans
indm10	imt	composite	autotransform	atr	transform
indm11	ime	composite	alldiagnostics	all	x11
indm2	im2	composite	fstableb1	fb1	x11
indm3	im3	composite	fstabled8	fd8	x11
indm4	im4	composite	icratio	icr	x11
indm5	im5	composite	idseasonal	ids	x11
indm6	im6	composite	m1	m1	x11
indm7	im7	composite	m10	m10	x11
indm8	im8	composite	m11	m11	x11
indm9	im9	composite	m2	m2	x11
indmovingseasf	isf	composite	m3	m3	x11
indmovingseasratio	isr	composite	m4	m4	x11
indq	iq	composite	m5	m5	x11
indq2	iq2	composite	m6	m6	x11
indtest	itt	composite	m7	m7	x11
peaks	spk	composite	m8	m8	x11
aic	aic	estimate	m9	m9	x11
aicc	acc	estimate	movingseasf	msf	x11
averagefcsterr	afc	estimate	movingseasratio	msr	x11
bic	bic	estimate	q	q	x11
hannanquinn	hq	estimate	q2	q2	x11
aveabsrevchng	ach	history	aictest	ats	x11regression

Table 3: **Tables That Can Be Saved as Percentages in the `save` Argument**

name	*short*	*spec*	*description of table*
indadjustfacpct	ipa	composite	indirect combined adjustment factors expressed as percentages if appropriate
indcalendaradjchangespct	ip8	composite	percent changes in original series adjusted for calendar effects
indirregularpct	ipi	composite	indirect irregular component expressed as percentages if appropriate
indrevsachangespct	ipf	composite	percent changes for indirect seasonally adjusted series with forced yearly totals
indrndsachangespct	ipr	composite	percent changes for rounded indirect seasonally adjusted series
indsachangespct	ip6	composite	percent changes for indirect seasonally adjusted series
indseasonalpct	ips	composite	indirect seasonal component expressed as percentages if appropriate
indtrendchangespct	ip7	composite	percent changes for indirect trend component
origchangespct	ip5	composite	percent changes for composite series
revsachangespct	p6a	force	percent changes in seasonally adjusted series with forced yearly totals
rndsachangespct	p6r	force	percent changes in rounded seasonally adjusted series
adjustfacpct	paf	x11	combined adjustment factors, expressed as percentages if appropriate
calendaradjchangespct	pe8	x11	percent changes in original series adjusted for calendar factors
irregularpct	pir	x11	final irregular component, expressed as percentages if appropriate
origchangespct	pe5	x11	percent changes in the original series
sachangespct	pe6	x11	percent changes in seasonally adjusted series
seasonalpct	psf	x11	final seasonal factors, expressed as percentages if appropriate
trendchangespct	pe7	x11	percent changes in final trend cycle

Name gives the name of each plot for use with the **save** arguments.
Short gives a short name for the tables of the **save** argument.
Spec indicates which spec the tables are defined for.

Table 4: **Default Critical Values for Outlier Identification Generated by X-12-ARIMA**

Number of Observations Tested	Outlier Critical Value	Number of Observations Tested	Outlier Critical Value
1	1.9600	48	3.6273
2	2.2365	72	3.7323
3	2.4449	96	3.8007
4	2.6180	120	3.8508
5	2.7455	144	3.8898
6	2.8433	168	3.9169
7	2.9215	192	3.9217
8	2.9859	216	3.9484
9	3.0403	240	3.9714
10	3.0871	264	4.0093
11	3.1280	288	4.0253
12	3.1643	312	4.0398
24	3.4194	336	4.0529
36	3.5458	360	4.0650

Table 5: **ARIMA Models Used by Default in the Pickmdl Spec**

Seasonal	*Nonseasonal*
$(0,1,1)(0,1,1)_s$	$(0,1,1)$
$(0,1,2)(0,1,1)_s$	$(0,1,2)$
$(2,1,0)(0,1,1)_s$	$(2,1,0)$
$(0,2,2)(0,1,1)_s$	$(0,2,2)$
$(2,1,2)(0,1,1)_s$	$(2,1,2)$

Seasonal gives the seasonal models used if seasonal regressors are not in the regARIMA model.

Nonseasonal gives the nonseasonal models used if seasonal regressors are present in the regARIMA model.

s is the seasonal period (12 for monthly data, 4 for quarterly)

Table 6: **Graphics Metafile Codes**

Code	Description
acf	residual autocorrelations
acf2	squared residual autocorrelations
adjcori	composite series (prior adjusted)
ador	original series (prior adjusted)
ahst	concurrent and revised seasonal adjustments and revisions
aichst	revision history of the likelihood statistics
ao	regARIMA AO outlier component
arat	final adjustment ratios
bct	point backcasts and prediction intervals on the original scale
btr	point backcasts and standard errors for the transformed data
cad	regARIMA calendar adjusted original data
caf	combined adjustment factors
cal	combined calendar adjustment factors
ccal	final combined calendar factors from irregular component regression
cfchst	concurrent out-of-sample forecasts
chol	combined holiday component
chss	sliding spans of the changes in the seasonally adjusted series
cmpcad	regARIMA calendar adjusted composite data

Table 6: **Graphics Metafile Codes (continued)**

Code	Description
cmpoad	regARIMA outlier adjusted composite data
cmpori	composite time series data (for the span analyzed)
cmppadj	prior adjusted composite data
cmpspor	spectrum of the original series
csahst	history of the percent change of the adjustments
ctd	final combined trading day factors from irregular component regression
ctrhst	history of the percent change of the trend-cycle values
fct	point forecasts and prediction intervals on the original scale
fcthst	revision history of the out-of-sample forecasts
fintst	final outlier test statistics
frfc	factors applied to get adjusted series with forced yearly totals
ftr	point forecasts and standard errors for the transformed data
idacf	residual autocorrelations for different orders of differencing
idpacf	residual partial autocorrelations for different orders of differencing
indahst	concurrent and revised indirect seasonal adjustments and revisions
indao	indirect additive outlier adjustment factors
indarat	indirect final adjustment ratios
indcaf	indirect combined adjustment factors
indcal	indirect calendar component
indchss	sliding spans of the changes in the indirect seasonally adjusted series
indfrfc	factors applied to get indirect adjusted series with forced yearly totals
indirr	indirect irregular component
indls	indirect level change adjustment factors
indmirr	irregular component modified for extremes from indirect adjustment
indmori	original data modified for extremes from indirect adjustment
indmsa	seasonally adjusted data modified for extremes from indirect adjustment
indrsi	final replacement values for SI component of indirect adjustment
indsa	indirect seasonally adjusted data
indsar	rounded indirect final seasonally adjusted series
indsass	sliding spans of the indirect seasonally adjusted series
indsat	final indirect seasonally adjusted series with forced yearly totals
indsf	indirect seasonal component
indsfss	sliding spans of the indirect seasonal factors
indsi	indirect unmodified SI component
indspir	spectrum of indirect modified irregular component
indspsa	spectrum of differenced indirect seasonally adjusted series
indtadj	indirect total adjustment factors
indtrn	indirect trend cycle
indyyss	sliding spans of the year-to-year changes in the indirect seasonally adjusted series
irr	final irregular component
irrwt	final weights for irregular component
ls	regARIMA level change outlier component
mdlest	regression and ARMA parameter estimates
mirr	modified irregular series
mori	original data modified for extremes
msa	modified seasonally adjusted series
mvadj	original series adjusted for missing value regressors
oad	regARIMA outlier adjusted original data
ori	time series data (for the span analyzed)
oricnt	time series data plus constant (for the span analyzed)
otl	regARIMA combined outlier component
pacf	residual partial autocorrelations
padj	prior-adjusted data
padjt	prior-adjusted data (including prior trading day adjustments)
ppradj	permanent prior-adjusted data
ppradjt	permanent prior-adjusted data (including prior trading day adjustments)

Table 6: **Graphics Metafile Codes (continued)**

Code	Description
pprior	permanent prior-adjustment factors
prior	prior-adjustment factors
ptd	prior trading day factors
rgseas	regARIMA user-defined seasonal component
rhol	regARIMA holiday component
rsi	final replacement values for SI ratios
rtd	regARIMA trading day component
sa	final seasonally adjusted data
sac	final seasonally adjusted series with constant value added
sar	rounded final seasonally adjusted series
sass	sliding spans of the seasonally adjusted series
sat	final seasonally adjusted series with forced yearly totals
sf	final seasonal factors
sfhst	concurrent and projected seasonal component and their percent revisions
sfr	seasonal factors, adjusted for user-defined seasonal regARIMA component
sfss	sliding spans of the seasonal factors
si	final unmodified SI ratios
siox	final unmodified SI ratios, with labels for outliers and extreme values
spcrsd	spectrum of the regARIMA model residuals
spirr	spectrum of modified irregular series
spor	spectrum of the original series
spsa	spectrum of differenced seasonally adjusted series
tadj	total adjustment factors
tc	regARIMA temporary change outlier component
tdss	sliding spans of the trading day factors
tprior	temporary prior-adjustment factors
trn	final trend cycle
trnhst	concurrent and revised Henderson trend-cycle values and revisions
usrdef	regARIMA user-defined regression component
xcal	final calendar factors from irregular component regression
xeastr	X-11 Easter adjustment factors
xhol	final holiday factors from irregular component regression
xtd	final trading day factors from irregular component regression
xtrm	final extreme value adjustment factors
yyss	sliding spans of the year-to-year changes in the seasonally adjusted series