# Building JOD Addons

January 29, 2019

## 1 Building JOD Addons

### 1.0.1 Introduction

JOD is distributed as three J addons: jod, jodsource and joddocument.
*This notebook describes how to build the JOD addons.*

### 1.0.2 JAL - the J package manager

J addons are managed with the J package manager. As you might expect addons have "packaging" requirements. For each JOD addon you must supply:

1. `manifest.ijs` - a J script defining addon contents

2. `history.txt` - an optional addon revision history file

3. addon files - a directory of files referenced by `manifest.ijs`

   To insure that all the required JOD addon files are generated and placed correctly you run a JOD macro script.
   *Yes, JOD builds itself!*

### 1.0.3 Running `buildjodistribution`

The following builds all JOD addons.
   It assumes:

1. The `jodsource` addon has been installed.

2. The JOD dictionaries (`joddev`), (`jod`) and (`utils`) are available.

3. Required build directories - shown below - are present.

```
NB. relative J folder ~JOD is defined
jpath '~JOD'

NB. JOD addon
~JOD/joddev/alien/stage/jod
~JOD/joddev/alien/stage/jod/jodbak
~JOD/joddev/alien/stage/jod/joddoc
~JOD/joddev/alien/stage/jod/joddoc/pdfdoc
~JOD/joddev/alien/stage/jod/jodexts
~JOD/joddev/alien/stage/jod/jodlabs

NB. JODSOURCE addon
~JOD/joddev/alien/stage/jodsource

NB. JODDOCUMENT addon
~JOD/joddev/alien/stage/joddocument
~JOD/joddev/alien/stage/joddocument/pdfdoc
```

4.  jod.pdf - built separately - is in

If these conditions are satisfied the following builds all JOD addons. When the macro runs it displays all the generated output files.

```
In [1]: clear ''
        load 'general/jod'
        dpset 'RESETME' [ portchars ''

        NB. open JOD dictionaries see:
        smoutput od ;:'joddev jod utils' [ 3 od ''

        NB. run build macro script and display output - note the location of the generated files
        rm 'buildjoddistribution'

+-+-------------------+------+---+-----+
|1|opened (rw/ro/ro) ->|joddev|jod|utils|
+-+-------------------+------+---+-----+
   NB.*buildjoddistribution s-- full JOD distribution build.

   cocurrent 'base'
   coclass tmploc_AAAjodbuild999_=: 'AAAjodbuild999' [ coerase <'AAAjodbuild999'
   coinsert 'ijod'

   NB. record open dictionaries and open JOD dictionaries
   ooo=: }. did 0
   od ;:'joddev jod utils' [ 3 od''
+-+-------------------+------+---+-----+
|1|opened (rw/ro/ro) ->|joddev|jod|utils|
+-+-------------------+------+---+-----+

   NB. get JOD build utilities and version tracking nouns
   tmploc get }. grp 'buildjod'
+-+-----------------+
|1|57 word(s) defined|
+-+-----------------+
```

```
    'JODSTAGEDIR JODGITDIR JODSOURCESTAGEDIR JODSTAGEPDFDIR JODSTAGEDOCDIR JODGITDOCDIR JODADDONDIR JODSCRIPTDIR JODEXTSDIR'=:

    updatejodmanifest 0
setting standard JOD interface
/VERSION=:'0.9.998 - dev'/VERSION=:'0.9.998 - dev'
/VERSION=:'0.9.998 - dev'/VERSION=:'0.9.998 - dev'
/VERSION=:'0.9.995'/VERSION=:'0.9.998 - dev'
JOD manifests updated
    JODVMD buildjodcompressed JODSTAGEDIR;JODGITDIR;JODADDONDIR;JODSCRIPTDIR
NB. System: JOD  Author: John D. Baker  Email: bakerjd99@gmail.com
NB. Version: 0.9.998 - dev  Build Number: 12  Date: 29 Jan 2019 18:54:14

compressing ...
output file locations:
c:/j64/j64-807/addons/general/jod/jod.ijs
c:/jod/joddev/script/jod.ijs
c:/jod/joddev/alien/stage/jod/jod.ijs
77597 script bytes
JOD compressed build complete
    JODTOOLSVMD buildjodtoolscompressed JODSTAGEDIR;JODEXTSDIR;JODSCRIPTDIR
NB. System: jodtools  Author: John D. Baker  Email: bakerjd99@gmail.com
NB. Version: 0.9.998 - dev  Build Number: 12  Date: 29 Jan 2019 18:54:14

compressing jodtools ...
output file locations:
c:/j64/j64-807/addons/general/jod/jodexts/jodtools.ijs
c:/jod/joddev/script/jodtools.ijs
c:/jod/joddev/alien/stage/jod/jodexts/jodtools.ijs
8078 script bytes
JODTOOLS compressed build complete
    JODVMD updatejoddistribution JODSTAGEDIR;JODGITDIR
c:/jod/joddev/alien/stage/jod/jodparms.ijs
c:/jod/joddev/alien/stage/jod/jodprofile.ijs
```

```
c:/jod/joddev/alien/stage/jod/history.txt
c:/jod/joddev/alien/jodgit/jod/history.md
c:/jod/joddev/alien/stage/jod/jodbak/jodprofilebak.ijs
c:/jod/joddev/alien/stage/jod/jodbak/jodparmsbak.ijs
c:/jod/joddev/alien/stage/jod/jodbak/joduserconfigbak.ijs
c:/jod/joddev/alien/stage/jod/manifest.ijs
c:/jod/joddev/alien/stage/jod/jodlabs/labexample001.ijs
c:/jod/joddev/alien/stage/jod/jodlabs/labdump.ijs
c:/jod/joddev/alien/stage/jod/jodlabs/jodintro.ijt
c:/jod/joddev/alien/stage/jod/jodlabs/joddump.ijt
c:/jod/joddev/alien/stage/jod/jodlabs/jodbest.ijt
c:/jod/joddev/alien/stage/jod/joddoc/pdfdoc/jodpdf.txt
c:/jod/joddev/alien/stage/jod/joddoc/linuxnotes.txt
c:/jod/joddev/alien/stage/jod/joddoc/macnotes.txt
JOD staging directories updated
    JODVMD updatejodsourcedumps JODSOURCESTAGEDIR
c:/jod/joddev/alien/stage/jodsource/manifest.ijs
c:/jod/joddev/alien/stage/jodsource/joddev.ijs
c:/jod/joddev/alien/stage/jodsource/jod.ijs
c:/jod/joddev/alien/stage/jodsource/utils.ijs
c:/jod/joddev/alien/stage/jodsource/jodsourcesetup.ijs
JODSOURCE stage directory updated
    JODVMD releasejod JODSTAGEDIR;JODSTAGEPDFDIR;JODSTAGEDOCDIR;JODGITDOCDIR
c:/jod/joddev/alien/stage/joddocument/manifest.ijs
c:/jod/joddev/alien/stage/joddocument/history.txt
c:/jod/joddev/alien/jodgit/joddocument/history.md
c:/jod/joddev/alien/stage/joddocument/pdfdoc/jod.pdf
JODDOCUMENT updated
JOD distribution build complete

    cocurrent 'base'
    coerase <tmploc_AAAjodbuild999_
1
```

### 1.0.4 Build Details

The rest of this notebook is for those brave souls that want to dive into the complexities of the JOD addon build code.

It's a good news bad news situation.

1. The good news: *all build code is in the three* `jodsource` *dictionaries.*

2. The bad news: *there is a lot of build code!*

Core JOD build code is in the JOD group (`buildjod`). Most JOD build macros (`get`) this group into a temporary locale. The following code fragment is found in a number of build macros.

```
cocurrent 'base'
coclass tmploc_AAAjodbuild999_=: 'AAAjodbuild999' [ coerase <'AAAjodbuild999'

NB. record open dictionaries and open JOD dictionaries
ooo=: }. did 0
od ;:'joddev jod utils' [ 3 od''

NB. get JOD build utilities and version tracking nouns
tmploc get }. grp 'buildjod'
```

In [2]: *NB. summary of group (buildjod) contents*
        hg 'buildjod'

```
+-----------------------+----------------------------------------------------------------------+
|CR                     |carriage return character                                             |
|CRLF                   |carriage return line feed character pair                             |
|JADDONJODPATH          |fully qualified client jod JAL subversion directory                  |
|JADDONJODROOTlinux     |linux jaddon directory root path                                     |
|JADDONJODROOTmac       |mac jaddon directory root path                                       |
|JADDONJODROOTwin       |windows jaddon directory root path                                   |
```

```
|JADDONJODSOURCEPATH    |fully qualified client jodsource JAL subversion directory      |
|JODTOOLSBUILDCNT       |(jodtools) build count                                         |
|JODTOOLSVERSION        |character string major-minor-point JODTOOLS version            |
|JODTOOLSVMD            |JODTOOLS version, make and date                                |
|JODVMD                 |version, make and date                                         |
|LF                     |line feed character                                            |
|TAB                    |tab character                                                  |
|TEMPFILE0              |temporary file must point to extant directory                  |
|afterstr               |retains string after first occurrence of (x)                   |
|alltrim                |trims all leading and trailing blanks                          |
|allwhitetrim           |trims all leading and trailing white space                     |
|beforestr              |retains string before first occurrence of (x)                  |
|betweenstrs            |select sublists between nonnested delimiters discarding delimiters |
|blkaft                 |appends necessary blanks to J tokens                           |
|buildjodcompressed     |builds a fully compressed JOD load test script                 |
|buildjodtoolscompressed|builds compressed version of the JOD tools class script        |
|changenqt              |change not quoted                                              |
|changestr              |replaces substrings - see long document                        |
|charsub                |single character pair replacements                             |
|ctl                    |character table to newline delimited list                      |
|dblquote               |enclose all character lists in blcl in " quotes                |
|decomm                 |removes comments from j words                                  |
|dewhitejscript         |removes all redundant blanks from J scripts                    |
|fexist                 |1 if file exists 0 otherwise                                   |
|fwrite                 |write to file (UTF8 file names) returns #bytes if successful _1 otherwise|
|jodsystempath          |path of JOD system - \ terminated                              |
|jpathsep               |standarizes J path delimiter to unix/linux forward slash       |
|justfileext            |file name and extension from fully qualified file              |
|lastjodhistoryversion  |extract last JAL compatible JOD version from build history     |
|md5fromstring          |computer md5 hash from character list                          |
|md5manifest            |compute md5 checksums from manifest files                      |
|read                   |reads a file as a list of bytes                                |
|releasejod             |final JOD replease steps                                       |
|setbuilddirs           |sets paths used by JOD build words                             |
```

```
|setjaddoncopy          |set distribution zip copy command for host OS                   |
|setjaddonpaths         |sets jaddon paths for host OS                                   |
|setjodinterface        |sets interface list nouns for various systems                   |
|showpass               |show and then pass noun                                         |
|smoutput               |session manager output                                          |
|timestamp              |formats timestamp as dd mmm yyyy hr:mn:sc                       |
|toCRLF                 |converts character strings to CRLF delimiter                    |
|toHOST                 |converts character strings to host delimiter                    |
|toJ                    |converts character strings to J delimiter LF                    |
|tstamp                 |time stamp                                                      |
|updateJODTOOLSfiles    |updates additional JOD addon locations with JODTOOLS script text|
|updateJODfiles         |updates additional JOD addon locations with JOD script text     |
|updatejoddistribution  |updates files in JOD distribution                               |
|updatejodmanifest      |set JOD addons manifests to current version                     |
|updatejodsourcedumps   |update files in JODSOURCE distribution                          |
|wie                    |write ignoring errors                                           |
|write                  |writes a list of bytes to file                                  |
+-----------------------+----------------------------------------------------------------+
```

### 1.0.5  A typical `manifest.ijs`

Each J addon has a manifest file that lists the contents of the addon. The following is the manifest for jod.

```
In [3]: NB. manifest for JOD
        CAPTION=:'JOD J Object Dictionary'
        VERSION=:'0.9.998 - dev'
        FOLDER=:'general/jod'
        PLATFORMS=:'win linux darwin'
        LABCATEGORY=:'General'
        FILES=: 0 : 0
        jod.ijs
        jodparms.ijs
        jodprofile.ijs
        manifest.ijs
```

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```
history.txt
jodbak/jodparmsbak.ijs
jodbak/jodprofilebak.ijs
jodbak/joduserconfigbak.ijs
joddoc/linuxnotes.txt
joddoc/macnotes.txt
joddoc/pdfdoc/jodpdf.txt
jodexts/jodtools.ijs
jodlabs/joddump.ijt
jodlabs/jodintro.ijt
jodlabs/jodbest.ijt
jodlabs/labexample001.ijs
jodlabs/labdump.ijs
)
RELEASE=:''
DEPENDS=: 0 : 0
data/jfiles
)
DESCRIPTION=: 0 : 0
JOD (J Object Dictionary) is a J programming and refactoring
tool. JOD supports linked dictionary databases and provides
tools for building, documenting and testing J systems.

JOD requires the (data/jfiles) addon.

If you install JOD it is highly recommended that you
install the related addon JODDOCUMENT. JODDOCUMENT
installs detailed PDF documentation for JOD.

For more information see the JOD wiki pages (Info Button),
run the lab "JOD lab JOD Introduction" - JOD labs are under
the General lab category. If you do not see JOD labs listed
on the Lab menus use the Lab browse button to access:
```

```
          ~addons/general/jod/jodlabs

    More information is available on the JOD Page and GitHub at:

        https://analyzethedatanotthedrivel.org/the-jod-page/
        https://github.com/bakerjd99/jod
    )
```

### 1.0.6  `buildjodcompressed`

All the code required to build JOD is available in the jodsource dictionaries. The following verb (`buildjodcompressed`) builds the "compressed" JOD load script. *It calls many JOD verbs.*

```
In [4]: buildjodcompressed=:4 : 0

        NB.*buildjodcompressed v- builds a fully compressed JOD load test script.
        NB.
        NB. dyad:   blVersion buildjodcompressed blclDirs
        NB.
        NB. verbatim:
        NB.
        NB. Builds a compressed JOD load script.
        NB.
        NB. Caveats:
        NB.
        NB. No error checking.
        NB. Requires standard J profile.
        NB. In addition to standard JOD directories this script also requires
        NB.   the staging directory: .../joddev/alien/stage/jod/
        NB.
        NB. author:  John D. Baker
        NB. changes: --------------------------
        NB. 08may28 rename/relocate compressed script to root of jod addon
        NB. 11feb05 use (jpathsep) to show portable style file paths
        NB. 11feb08 coinsert 'ijod' added after moving JOD interface to ijod
```

```j
NB. 11nov24 tested on linux
NB. 14nov14 adjusted for j 8.03 (runs on win32 J 8.03 - not 64 - no zfiles)
NB. 15mar15 remove zfiles - redirect build to .../joddev/alien/stage/... directories
NB. 17jan09 improve caveat notes for running on jconsole versions
NB. 17mar03 macro script converted to verb

'JODSTAGEDIR JODGITDIR JODADDONDIR JODSCRIPTDIR'=. y

NB. set vmd - version, make, date
'jodversion jodbuildcnt'=.2{.x
jodbuilddate=. alltrim tstamp''
jodbuildcnt=. >:jodbuildcnt

NB. increment build and save - must be done before
NB. script generation to insure header and class JODVMD match
JODVMD=.(jodbuildcnt;jodbuilddate) (1 2)}x

NB. save incremented version, make, date in dictionary
assert. >0{(WORD_ajod_,NVTABLE_ajod_) put 'JODVMD';WORD_ajod_;wrep_ajodstore_ 'JODVMD'

NB. set output files
JODFILE=. 'jod.ijs'

NB. working JOD addon script
JODADDONFILE=. JODADDONDIR,JODFILE

NB. backup of JOD script placed in put dictionaries script directory
JODSCRIPTFILE=. JODSCRIPTDIR,JODFILE

NB. JOD staging directory under put dictionaries alien directory
JODSTAGEFILE=. JODSTAGEDIR,JODFILE

head=.'NB. System: JOD  Author: John D. Baker  Email: bakerjd99@gmail.com',LF
head=.head, ('NB. Version: ',(jodversion),'  Build Number: ',(":jodbuildcnt),'  Date: ',jodbuilddate),LF
```

```
smoutput head

NB. turn off white space preservation during JOD load
hc=.head,'(9!:41) 0',LF

NB. get preprocessor script - leave only header comments
s=. dewhitejscript (1;0 2){:: MACRO_ajod_ get 'jodprep'

NB. main JOD classes
g=. ;: 'jodon jod jodstore joddob jodmake jodutil'

NB. collect group dependents
deps=. gdeps&.> g

smoutput 'compressing ... '
NB. dewhite group headers
h=. dewhitejscript&.> {:"1 >{: GROUP_ajod_ get g

NB. compress all nondependent words in each group (a cruncher)
code=. , }.@:compj&> (({}.@:grp)&.> g) -.&.> deps

NB. combine header and word definitions
s=. s , ; , h ,. code

NB. append post processor script
s=. s, dewhitejscript (1;0 2){:: MACRO_ajod_ get 'jodpost'

NB. remove a few remaining redundant blanks after
NB. assignments - their presence annoys me!
s=. hc , '/ =./=./ =:/=:' changenqt s

NB. save compressed load scripts
smoutput 'output file locations:'
(s=. toJ s) write showpass JODADDONFILE
```

```
    smoutput s   write showpass JODSCRIPTFILE
    smoutput s   write showpass JODSTAGEFILE
    updateJODfiles s

    NB. update build history - stored as plain text macro
    JODBUILDHISTORY=. (1;0 2){:: MACRO_ajod_ get 'JODBUILDHISTORY'
    JODBUILDHISTORY=. JODBUILDHISTORY,(2#LF),head
    assert. >0{MACRO_ajod_ put 'JODBUILDHISTORY';TEXT_ajod_;JODBUILDHISTORY

    NB.byte size of generated plain text script
    smoutput (":#s),' script bytes'
    smoutput 'JOD compressed build complete'
    )

    NB. erase to prevent exeution out of context
    erase 'buildjodcompressed'
```

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### 1.0.7 `buildjodcompressed` uses union

The following displays all the words on the `buildjodcompressed` call tree. All of these words are in the source dictionaries.

```
In [5]: NB. find the uses union - unique list of words on the call tree
        'rc xr'=. 31 uses 'buildjodcompressed'

        NB. display all the words called by (buildjodcompressed)
        ('Direct calls';'Locatives - JOD internals') ,: 40&list &.> }. ,xr


+------------------------------+------------------------------+
|Direct calls                  |Locatives - JOD internals     |
+------------------------------+------------------------------+
|ALPHA           CR            |GROUP_ajod_     MACRO_ajod_    |
|CRLF            CWSONLY        |NVTABLE_ajod_   TEXT_ajod_     |
```

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```
|DEFAULT          DEPENDENTSEND   |WORD_ajod_      wrep_ajodstore_ |
|DEPENDENTSSTART  DICTIONARY      |checkopen__ST   defwords__ST    |
|DOCUMENT         ERR001          |getdicdoc__ST   getdocument__ST |
|ERR002           ERR003          |getexplain__ST  getgstext__ST   |
|ERR004           ERR008          |getntstamp__ST  getobjects__ST  |
|ERR010           ERR014          |invfetch__ST    wttext__MK      |
|ERR015           ERR020          |namecats__MK    obtext__UT      |
|ERR023           ERR024          |checkput__ST    putdicdoc__ST   |
|ERR025           EXPLAIN         |putexplain__ST  putntstamp__ST  |
|GROUP            INCLASS         |puttable__ST    puttexts__ST    |
|INCREATE         INPUT           |putwords__ST    JARGS__MK       |
|INSIZE           JNAME           |checkpath__ST   gslistnl__ST    |
|LF               MACRO           |putgs__ST       dnlsearch__ST   |
|MACROTYPE        MAXNAME         |rxall_jregex_                   |
|NAMEALPHA        NVTABLE         |                                |
|OBFUSCATE        OBFUSCCNT       |                                |
|OBFUSCPFX        OBJECTNC        |                                |
|PUTBLACK         SUITE           |                                |
|TAB              TEST            |                                |
|WORD             alltrim         |                                |
|badblia          badbu           |                                |
|badcl            badil           |                                |
|badlocn          badrc           |                                |
|badunique        beforestr       |                                |
|blkaft           boxopen         |                                |
|changenqt        changetok       |                                |
|checknames       checknttab      |                                |
|checknttab2      compclut        |                                |
|compj            compressj       |                                |
|ctit             ctl             |                                |
|decomm           dewhitejcr      |                                |
|dewhitejscript   dnl             |                                |
|exobrefs         firstone        |                                |
|gdeps            get             |                                |
```

```
|grp            gsmakeq         |                                |
|isempty        islocref        |                                |
|jderr          jnfrblcl        |                                |
|ljust          nc              |                                |
|nlargs         ok              |                                |
|plt            put             |                                |
|rv             rxall           |                                |
|second         showpass        |                                |
|smoutput       timestamp       |                                |
|toJ            trimnl          |                                |
|tstamp         updateJODfiles  |                                |
|wie            write           |                                |
+-------------------------------+--------------------------------+
```

In [ ]: