Yohkoh Analysis Guide

Portion of Volume 3: Reference Guide

Installation Guide

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A Installation and Maintenance of the Yohkoh Software

A.1 Network Installation

This section describes the network installation of compressed tar files on Unix systems[1]. Current disk allocation requirements: Approximately 100 MBytes which includes the Software and several supporting databases (35 Mbytes for only IDL and FORTRAN software or 25 Mbytes for only IDL software).

1. Determine which user will own the Yohkoh software and database area. Some sites prefer to create a special "Yohkoh" account for management but this is not an installation requirement. Log into the appropriate account.
2. Determine the path where you want to locate the Yohkoh Software. Let's call this path *yparent*. This pathname should be an nfs name per /etc/fstab if the software is to be shared among machines. Of course, the owner of the Yohkoh Software (determined in preceding step) requires write access to *yparent*.
3. Transfer the boot-up script via anonymous FTP.

```
% mkdir -p yparent/ysw/swmaint/tar          # local directory for tar files
% cd yparent/ysw/swmaint/tar                # move there
% ftp 133.74.8.100                          # user=ftp, passwd=name@node
FTP> cd pub/swmaint/tar                     # remote location (isass0)
FTP> get ys_install                         # boot up script
FTP> quit
```

4. Install the software and standard database using the script *ys_install*. The defaults are usually ok, but see script header for available options. Use the */HELP* switch to get updated instructions and the latest Yohkoh Software and Database descriptions without installing anything. (current directory is still = *yparent*/ysw/swmaint/tar).

```
% csh ys_install                            # INSTALL, take defaults
% csh ys_install [OPTIONS]                  # INSTALL, use 1 or more options
% csh ys_install /HELP                      # No installation, Help Information
```

Section B.1 describes the procedure for setting up the Yohkoh environment for new accounts.

A.2 Network Upgrades

This section is applicable if you have previously installed the Yohkoh Software on your Unix workstation. It will upgrade the latest version of the software and database files using the existing locations.

[1] If you have already installed Yohkoh Software in the past and do not need to relocate it, skip to section A.2. (Upgrades) instructions.

NOTE: beginning with Yohkoh Software Version# 931107.02, auto-upgrade scripts are included in the distribution. Once you have upgraded to this level, all FTP commands are automatically issued. For older Versions (before 930513.01) you must first retrieve the installation "boot" script – other files will be auto-FTPed as required.

% **tail -1 $ys/gen/setup/ys.version** # determine current version number

A.2.1 New Versions (starting with 931107.02)

Log in as owner of the Yohkoh Software tree; verify that $ys is defined. For possible options see header of $ys/gen/script/ys_install. Next, [2]

% **csh $ys/gen/script/ys_install**
% **csh $ys/gen/script/ys_install [OPTIONS]**

A.2.2 Old Versions (Before 930513.01)

Log in as owner of the Yohkoh Software tree; verify that $ys is defined

% **cd $ys/swmaint/tar** # local tar site
% **ftp 133.74.8.100** # user=ftp, passwd=name@node
FTP> **cd pub/swmaint/tar** # remote location (isass0)
FTP> **get ys_install** # boot up script
FTP> **quit**

see header of $ys/swmaint/tar/ys_install for options, then:

% **csh $ys/swmaint/tar/ys_install**
% **csh $ys/swmaint/tar/ys_install [OPTIONS]**

A.3 Automatic Upgrades of Yohkoh Software

The command to automatically upgrade the Yohkoh software on a periodic basis may be inserted into a "cron job" at remote sites[3]. If you are not familiar with function and operation of cron jobs on your particular machine, you should consult with your system manager. Although there may be some system dependencies not covered here we present some sample implementations here. Notes: *ys* is the path assigned to $ys ; *ysowner* is the username of the Yohkoh Software owner.

[2] this command may be placed in a daily "cronjob" to provide automatic upgrades – see discussion on page 2.
[3] Requires Yohkoh Software Version: 931108.02 or higher

SUN/Mips/SGI/OSF

1. Log on as the owner of the Yohkoh Software
2. Edit the "crontab" file with the command:

   % **crontab -e**

   and add a line with the format:
   `MM HH * * * setenv ys` *ys*`;csh $ys/gen/script/ys_install`
3. A specific example which upgrades the software daily at 23:00 local time is:
   `00 23 * * * setenv ys /user1/ysw; csh $ys/gen/script/ys_install`

Ultrix

1. Log on root
2. Add the following line to /etc/crontab via editor
   `MM HH * * * rsh -l` *ysowner* `"setenv ys` *ys*`;csh $ys/gen/script/ys_install"`
3. A specific example which upgrades the software daily at 2:00 local time is:
   `00 02 * * * rsh -l ysoft "setenv ys /user1/ysw; csh $ys/gen/script/ys_install"`

For Ultrix systems that wish to use the root account to run the batch job, you can exclude the "rsh -l *ysowner*" portion of the command. If you do not run as the root user, then you will also need to edit the `~/.rhost` file for the account which will be used to execute the "ys_install" script, and add a line similar to the following line, except with your node name.

```
isass0.solar.isas.ac.jp          root
```

A.4 Site Specific Cleanup Script

Sites may choose to execute a customized cleanup script following a Yohkoh installation. Common uses for this could be to set file protections, ownerships, group access etc. (chmod, chown, chgrp). It is possible to have such a script run automatically as part of the installation/upgrade procedure by naming the script $ys/site/script/ys_install.local. If this file exists, the Yohkoh Installation scripts will source it following the successful completion of an upgrade and/or installation. It is up to the local manager to verify that all commands within this script have the correct syntax. For example, if *chown* commands are issued, then the Yohkoh installation procedure would have to be run from the root account to have these take effect.

A.5 DATA_PATHS

Remote sites have many differences in available disk space, physical disk names and path names. To allow seemless software access to Yohkoh data and database files, we make use of Unix environmentals and VMS logicals within the routines. This allows relocation of existing data areas and addition of new data areas with no changes required to the access software.

Reformatted data access routines use logicals or environmentals which are named “ydNN” where “yd” stands for Yohkoh data and NN is an integer. Every site should define at least one data area (usually yd0); there is no upper limit on the number. The most common scheme is to have one area (and one environmental) per physical disk available for Yohkoh reformatted data.

To add a new area (ie, add a new environmental), a line should be added to the file $ys/site/setup/setup_paths. This script file is one of a few which are automatically executed during the Yohkoh IDL setup to configure the local and Yohkoh environment.

```
Each line is a Unix 'setenv' command of the form:

           setenv  yd<N>  <pathname>
WHERE:
<N>        = integer = disk area number (traditional to start at zero (0) )
<pathname> = pathname of data area to add
             If the area is to be shared via NFS, this should include the
             mount name as found in /etc/fstab
```

For example, appending the following lines to $ys/site/setup/setup_paths would add 3 reformatted data areas.

```
#....
#..... current contents of file: $ys/site/setup/setup_paths
#.....
# add 3 data areas for Yohkoh reformatted data
setenv yd0     /user1/yohkoh
setenv yd1     /data_disk2/yohkoh
setenv yd2     /machine_mount2/scratch/yohkoh
#...............................................
```

These areas will then be searched by the Yohkoh Software for reformatted data files. (creating the directories and placing data there is not covered here).

A.6 Receiving and Installing Secondary Yohkoh Database Files

A summary of supporting and secondary databases and the approximate size is provided in the following table. Certain database sets are automatically included when a Software installation or full upgrade is performed (described in previous section). All database files are also available on Exabyte tape (“ydb tape”) To receive a tape containing the mission-long Yohkoh database and to be placed on the distribution list for future releases, send e-mail:

```
  TO: software@isass0.solar.isas.ac.jp
SUBJ: ydb tape request
```

The IDL routine RD_YDBTAP (described in the User's Guide) can be used to extract and install user specified portions (or all) of the Yohkoh database from the ydb tape. That routine will optionally provide assistance in setting up and customizing the local environment prior to extraction and installation. The physical disk locations where each database resides at any given site are flexible since all software references are through the use of environmentals (Unix) or logicals (VMS). The IDL routine HELP_PREFIX provides some additional information about the specific database contents.

This table can be used to estimate current and future disk space requirements for the Yohkoh database. Unless otherwise noted, the distributed files contain one week of data. Column one (PFX) indicates the three letter prefix associated with each database set. Items marked with an asterisk are included in the automatic software installation procedure described in the preceding sections.

PFX	Contents	Avg File Size		Mission Size (Thru 1/94)
ATR	Raw S/C Attitude Database	2684 Kb		314.6 Mb
ATT	Processed S/C Attitude Database	2024 Kb		237.2 Mb
EVN*	Yohkoh Event Log	14 Kb		1.8 Mb
FEM*	Yohkoh Orbital Ephemeris	7 Kb		1.2 Mb
G6D	GOES 3 Sec Light Curve for S/C 6	2725 Kb		181.0 Mb
G7D	GOES 3 Sec Light Curve for S/C 7	2742 Kb		182.2 Mb
GBE	GRO BATSE Event Log	19525 Kb	[1]	19.1 Mb
GBL*	GRO BATSE Light Curves	143 Kb		19.1 Mb
GEV*	GOES Event Log	5 Kb		0.7 Mb
GXD	GOES Derived One Minute Light Curve Data	5 Kb		0.0 Mb
GXT*	GOES One Minute Light Curve Data	330 Kb		40.0 Mb
NAR*	NOAA Active Region	3 Kb		0.4 Mb
OBD	BCS Observing Log	690 Kb		81.7 Mb
OSF	SXT Full Frame Observing Log	52 Kb		6.3 Mb
OSP	SXT Partial Frame Observing Log	385 Kb		45.6 Mb
OWH	WBS/HXT Observing Log	1266 Kb		150.9 Mb
SDC	SXT Dark Current Images	1827 Kb		201.7 Mb
SDW	SXT Dark Current Images for Warm CCD	5196 Kb		81.2 Mb
SFC	SXT FFI Calibration (Leak) Image	528 Kb		4.2 Mb
SFM	SXT FFI Monthly File (daily SFD image)	6506 Kb	[M]	158.9 Mb
SSC	SXT Synoptic Images (centered)	697 Kb		77.6 Mb
SSE	SXT Synoptic Images (east of center)	703 Kb		(inc)
SSW	SXT Synoptic Images (west of center)	703 Kb		(inc)
XAD*	Exabyte ASCII Directory for Archive Tape	10 Kb		2.1 Mb
XBD*	Exabyte Binary Directory for Archive Tape	7 Kb		1.5 Mb

[1] - only 1 file for mission
[M] - each file contains one month of data

The following table indicates which datasets are important for various purposes.

Description	Datasets
Critical general datasets	FEM
Critical datasets for SXT calibration	SDC, SFC
Nice SXT datasets to have	SSC/E/W, SFM
Critical datasets for alignment	ATT
Non-necessary datasets for alignment	PNT, ATR
Observing log and event logs – nice to have	OBD, OSP, OSF, OHW, EVN
Sets that make reading Exabytes easier	XBD, XAD
Nice sets to have (don't take much space)	GEV, GXT, GBE, GBL
Nice sets to have (take much space)	NAR, G6D, G7D

A.7 Customizing the Overall Yohkoh Environment

The Yohkoh Software system allows customization of both site and user level IDL and operating system environments . These features are optional, and many users may work effectively without any knowledge or implementation of these features. On the other hand, as the Yohkoh system evolves at a given site, some of these features may be required to allow the Yohkoh system manager to tailor the system for the given site resources. For example, the multitude of Yohkoh ancillary databases may be divided among multiple disks or machines to match local disk resources. Sophisticated users may use some of these features to further customize the IDL environment while still remaining within the Yohkoh framework.

A.7.1 Use of Environmentals/Logicals for Yohkoh Software and Database

All supported Yohkoh Software uses Unix environmentals and VMS logicals for data and database files. The Yohkoh Software tree is also defined in terms of environmental variables. This allows relocation of Yohkoh Software and/or database files to different paths, disks, or machines without any changes required in the source code and may occur transparently to the Yohkoh Software user. It also minimizes restrictions on disk space allocation as different sites may organize the Yohkoh databases to suit the local resources.

A.7.2 Yohkoh environmental configuration files

The Yohkoh OS and IDL environment is established through the execution of several Unix script (or VMS command) files and IDL startup files. A single script acts to control the flow of script and setup execution. In some cases, multiple versions of scripts may exist in a general, site, and personal areas to allow customization according to the following execution order.

	Type	Path	Function
1)	GEN	$ys/gen/setup	setup default Yohkoh environment
2)	SITE	$ys/site/setup	allow site modifications to the above
3)	PERS	$HOME	allow personal modifications to the above

The files described below are used to configure the Yohkoh environment. Files for which a SITE version is maintained may be used by the site Yohkoh Software manager to customize the site environment. If no site version currently exists, the corresponding file from gen ($ys/gen/setup) may be used as an example or template (ie, copy to $ys/site/setup and edit). Note that files in SITE are not overwritten by a Yohkoh Software upgrade so site changes are not clobbered (unless requested).

File	Function	GEN	SITE	PERS
idl_setup	control flow of setup execution	yes	no	no
setup_paths	set top level database locations	yes(1)	yes	no
setup_dirs	define specific database paths	yes	yes	no
setup_alias	define OS symbols / aliases	yes	yes	no
setup_mail	define mailing list env	yes	yes	no
setup_ysenv	other env/alias customization	yes	yes	yes
IDL_STARTUP	define Yohkoh IDL environment	yes	yes(2)	yes(3)

1. the version in gen is not executed – it is provided as a template for site managers (some internal documentation)
2. The file $ys/site/setup/IDL_STARTUP (maintained by the site manager) is executed if it exists.
3. If user has the $IDL_STARTUP environmental defined, it will be executed following the Yohkoh-wide IDL_STARTUP. See the IDL manual for a description of IDL_STARTUP.

A.7.3 setup_paths – Yohkoh Database and Reformatted Data Locations

The site version of setup_paths may be used to split the Yohkoh database across multiple disks or machines. It is also used to define the areas where the software will search for reformatted files. It resolves top level environmentals with site specific path names. Local pathnames should include NFS names (per fstab) if database or reformatted files are shared among machines. The file: $ys/gen/setup/setup_paths may be used as a template if $ys/site/setup/setup_paths does not already exist. It includes some internal documentation and examples.

A.7.4 setup_dirs

This script defines specific database environmentals in terms of the top level environmentals defined in setup_paths. The site version of this file is only required if the Yohkoh database is split. As with setup_paths, this is just a series of Unix setenv commands (or VMS DEFINE commands). We recommend not including path references in this file – instead, the definitions should be in terms of the environmentals (or logicals) defined in setup_paths.

A.7.5 setup_alias

This script provides a convenient method to define aliases or symbols which can be used by all site users. This can provide a common OS environment at the site.

A.7.6 setup_ysenv

The intended use of this script is to set up several Yohkoh environmentals which control IDL startup. These include setting defaults for X windows startup, message of the day display, fast startup, etc. Use the "gen" version of the file ($ys/gen/setup/setup_ysenv) as a template and for some discussion of options. The site manager may use the site version of this file to change the distributed defaults. If a user has a file with this name in the HOME directory, it will be executed to supercede or supplement the default and site environment. Since it is just a script file which gets automatically executed during the Yohkoh startup, sophisticated users may discover additional uses.

A.7.7 Multiple Software Host and Software Relocation

Large, multi-user Yohkoh sites may consider maintaining multiple sets of the Yohkoh Software on different machines. The main purpose of such a system is to allow software access from a backup system(s) in the event that the primary system is off-line (e.g., for maintenance, repairs, etc). The Yohkoh Software distribution includes scripts which allow automatic selection of a host. The file: $ys/site/setup/yspaths.config is a data file which is used by the Yohkoh startup script to dynamically assign the location of the Yohkoh Software system. This file is created during the installation procedure and initially just includes an entry for the machine and path where the Yohkoh Software is located. The script *ys_newuser* (see Section B.1) copies this to the home directory of Yohkoh users to allow access to the Yohkoh setup scripts. To define additional hosts at a given site, the Yohkoh site manager can edit the file: $ys/site/setup/yspaths.config. One line containing two fields should be added. The file is of the form:

```
host1    path1          # original contents
host2    path2          # second host added
(host3)  (path3)
```

Where *hostN* is the hostname and *pathN* is the path location of Yohkoh Software. An example of this file is

```
isass0  /0p/yohkoh
isass2  /2p/yohkoh_sw
```

A.8 Initial Installation Using Exabyte Tapes

The large majority of users are currently performing initial Yohkoh Software installation via the network install. If a network installation is not practical, send e-mail:

```
TO:   software@isass0.solar.isas.ac.jp
SUBJ: tape installation procedure
```

We offer an Exabyte "boot up" tape and installation instructions.

A.9 VMS Installations

The Yohkoh Software System is designed to be compatible with the VMS operating system and is currently running under VMS at several locations, however, we recommend that Unix be selected for analysis of Yohkoh data if possible.

Currently, the VMS installation and upgrade process is not as automated as the Unix procedure. At the time of publication, the BCS team was the main user of the Yohkoh package under VMS, and it appears that they will transition completely to Unix in the future.

The BCS team may be able to offer some guidance and VMS command files to assist in installing the Yohkoh system under VMS, however we can make no promises that future Yohkoh software releases will be supported on VMS systems. For more information, send e-mail and it will be forwarded appropriately.

```
TO:   software@isass0.solar.isas.ac.jp
SUBJ: VMS installation procedure
```

A.10 Explanation of Software Release Version Numbers

Yohkoh Software version numbers are used for system maintenance and to facilitate problem reporting and tracking. The version numbers consist of two fields of the form:

```
YYMMDD.NN         Where:  YYMMDD = Date of Release
                              NN = Major Release Number
```

There are two types of "Releases", both of which are accompanied by an update to the date field. A "Major Release", accompanied by an increment of "NN", is generated when there is a major restructuring (deletions, renaming, moves) of the Yohkoh tree. A "Major Release" requires that remote sites execute a full upgrade (which copies over all of the *ys* tar files except *site*). A "Minor Release" is generated when there are a large number of additions to the tree, but not other restructuring. Remote sites can upgrade to new minor release levels with an incremental file – a minor release is a method of maintaining the incremental files at reasonable sizes. Upgrades to new major and minor release levels are both automatically accomplished by the upgrade scripts *ys_install*. Version numbers at remote sites are compared to the version numbers on the master copy (currently isass0) and the appropriate files are transferred and installed. To determine the Yohkoh Software version you are running type:

% **tail -1 $ys/gen/setup/ys.version**

When reporting problems, please include the Software version number within the message.

B Customizing Your Personal Yohkoh Working Environment

This section briefly describes options available for customizing the Yohkoh data analysis environment. To gain a deeper understanding of the IDL related items listed here, the user is referred to to the IDL User's Guide, Chapter: RUNNING IDL.

B.1 Initial User Setup (.yslogin)

For new user accounts, execute the following procedure one time.[4] First, determine the location of the Yohkoh software at your site. Call this path *ysw*.

% **setenv ys** *ysw*
% **source $ys/gen/script/ys_newuser**

Once this procedure has been executed, the following command will define the Yohkoh IDL environment:

% **source ~/.yslogin**

Most users will find it convenient to have this Yohkoh setup done automatically as part of the login procedure. For Ultrix and IRIX users, insert the line into your ~/.login file. Users of SUN, Mips, and most others should insert the line into the ~/.cshrc file.

B.2 Running IDL (run_idl)

The file $ys/gen/setup/run_idl is a script which performs the Yohkoh IDL startup procedure. When working within the Yohkoh environment, this script is run when a user enters the command `idl`. The alias *idl* is defined during the execution of idl_setup.

The following functions are performed by the run_idl script:

- define the IDL SW !path (Concatenation of Yohkoh, Personal, and IDL paths)
- setup remote X display if not already set (selected systems)
- display message of the day
- execute the Yohkoh wide IDL_STARTUP
- optionally execute user defined IDL_STARTUP
- enter IDL

The following additional options are available by entering a second parameter on the command line:

[4] Since the Yohkoh Software at a site is often shared among many machines, we supply an initialization script to dynamically define the location of the Yohkoh Software. This will avoid workstation hangups when the Yohkoh server is down and also permits multiple Yohkoh hosts (page 8).

```
% idl nox        # bypass X windows setup - useful to avoid color table
                 # corruption caused by 2nd IDL session or to speed up remote

% idl tek        # startup with plot device set to 'TEK' (Tektronics mode)

% idl noys       # do not include Yohkoh paths in IDL !path setup
                 # for non-Yohkoh IDL work(?!)

% idl fast       # define path from file (faster) [if supported at site]

% idl ahead      # place personal path ($IDL_PATH)  ahead of Yohkoh paths
                 # in IDL !path variable - default is Yohkoh paths first
```

B.3 Personal SETUP_YSENV

Under Unix, the Yohkoh startup will automatically execute (source) a script file in the users home directory which is named setup_ysenv. This can be used to personalize the operating system environment. One simple use of this file would be to alter some of the Yohkoh environmental startup defaults; see $ys/gen/setup/setup_ysenv for a convenient template and documentation.

B.4 IDL_PATH

Users may define one or more personal paths which may be used in conjunction with the extensive Yohkoh path definition. This will permit use of local and personal IDL libraries while still remaining within the Yohkoh analysis framework. To use this feature, the user should define the Unix environmental or VMS logical: IDL_PATH. See the IDL User's Guide, Chapter "RUNNING IDL" for a discussion of the Unix and VMS IDL_PATH syntax. An example of a command located in the `.login` file which will add all directories which have .PRO files under /2p/morrison/soft and /usr/local/lib/idl/lib is:

```
setenv IDL_PATH +/2p/morrison/soft:+/usr/local/lib/idl/lib
```

B.5 Personal IDL_STARTUP

Yohkoh users may define an IDL startup routine by defining the Unix environmental or VMS logical IDL_STARTUP. An IDL startup is a file which contains IDL commands. These commands are automatically executed at startup time to allow customization of the IDL environment. If IDL_STARTUP is defined, it is executed after the Yohkoh-wide and site IDL_STARTUP files so the user values will supercede the defaults. An example of a command located in the `.login` file which will cause the IDL commands in `/2p/morrison/idl_startup.pro` to be executed when IDL starts is:

```
setenv IDL_STARTUP /2p/morrison/idl_startup.pro
```

B.6 Multiple SW Host capability

See the description on page 8 for details on how to set up your system so that it can use a backup machine in the case when the primary machine is unavailable.

B.7 Switch between primary and backup Yohkoh Hosts

For sites which support multiple software hosts, the following Unix commands are available. Switch to the backup host can be done for backup system testing or in the event that the primary host has 'gone down' after your session has already started (automatic host selection is done when your session starts)

% **idlback**	# select backup host
% **idlnorm**	# select primary host (startup value)

B.8 setenv DISPLAY

It is possible to log onto a remote machine to run IDL and to have the X-window display redirected back to your local machine. See the description in the Appendix of the User's Guide for details for the necessary commands.