

Release Notes for New User Interface Program

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1 About This Release

This is the first release of the User Interface Program (UIP) which runs on Unix/Linux platforms.

2 Syntactic Differences

Compared to the original UIP, the following syntactic differences exist:

- Under the original UIP, commands could have some parameters and qualifiers. Qualifier identifiers started with a forward slash “/”. Qualifiers could have a value or list of values. Qualifiers could be negated by prefixing the name with “NO”. Under the new UIP, commands can have some arguments and options. Option identifiers start with a forward slash “/”. Options can have one or more arguments. Options can not be negated.
- Under the original UIP, command parameters and qualifiers could be given in any order. Under the new UIP, command arguments must immediately follow the command identifier. For example, the following two lines had the same effect under the original UIP:

```
FIVE_POINT 15 /ONE_OFF  
FIVE_POINT /ONE_OFF 15
```

However, only the former is accepted by the new UIP. The latter is invalid because 15 is interpreted as the argument of the /ONE_OFF option rather than the required first command argument OFFSET.

- Under the original UIP, if a qualifier took a value, they were separated from each other by an equal sign “=”. If a qualifier took a list of values, they were comma “,” separated and enclosed by parentheses “(” and “)”. Under the new UIP, an option identifier and option arguments are separated by whitespace, and option arguments are delimited by the next option identifier or end of line. For example, the following line changed the center frequency of all four subbands of the AOS5 by 50 MHz under the original UIP:

```
SPECTROMETER /AOS5 = ( 0.05, 0.05, 0.05, 0.05 )
```

Under the new UIP, it is written as follows:

```
SPECTROMETER /AOS5 0.05 0.05 0.05 0.05
```

- Under the new UIP, whitespace is needed in front of each option. Under the original UIP, whitespace was optional. For example, the following was accepted by the original UIP but is not by the new UIP:

```
SECONDARY/STOP
```

3 New Features

The following new features are available in this release:

- The `pyuip` package provides access to UIP commands from within Python programs. The `SIC\PYTHON` command enables to execute Python programs from within the UIP. For example, you can do something like this in Python:

```
import pyuip
throw = 300
pyuip.comm('azo /chop ' + str(throw / 2)) # Nod
```

- Some score board variables are accessible as SIC variables. For example, you can do something like this:

```
SPECTROMETER /FFTS1
LO 12C02-1 /RECEIVER RX230
TCAL /OFFSET 180
IF 'FFTS1_TSYS'.GT.1000 THEN
    SAY "Nice..."
END IF
```

4 New Commands

The following commands are new in this release:

- `EQU` — supersedes the `DEC2`, `DECLINATION`, `RA`, and `RA2` commands. It allows you to enter equatorial coordinates directly. For example, the following will instruct the telescope to track the equatorial coordinates $\alpha_{B1950.0} = 05^h 32^m 47^s$, $\delta_{B1950.0} = -05^\circ 24' 24''$:

```
EQU 05:32:47 -05:24:24 1950
```

- `FCAL` — was part of the `CALIBRATE` command. It allows you to take a frequency calibration scan.
- `GAL` — supersedes the `GB` and `GL` commands. It allows you to enter Galactic coordinates directly.
- `OFF_POSITION` — allows you to specify the default offsets for `OFF` scans. For example, the following sets the default to 300" symmetric `OFF` for the `OO_SCAN` command and +300" asymmetric `OFF` for the `TCAL` command and others which can only take either asymmetric or designated `OFF`:

```
OFF_POSITION 300
```

- `OPTICAL_POINTING` — was part of the `OBSERVE` and `POINTING_FILE` commands. It allows you to make an optical pointing measurement.
- `TCAL` — was part of the `CALIBRATE` command. It allows you to take a temperature calibration scan.
- `TEXAS` — was part of the `UCB_SCAN` command. It allows you to control the telescope in Texas mode.
- `VANE` — was part of the `CALIBRATE` command. It allows you to move the temperature calibration vane in and out of the telescope beam.
- `_NEW_POSITION` — renamed from `SBUPDATE`.
- `_OFF_POSITION` — renamed from `OFF_POSITION`.
- `_ON_POSITION` — renamed from `ON_POSITION`.
- `_TAKE_DATA` — renamed from `TAKE_DATA`.

5 Commands with Major Changes

The following commands have major changes in their interface and functionality compared to the corresponding ones in the original UIP:

- AZO, DECO, ELO, GBO, GLO, RAO, & ZAO — the first command argument specifies the “standard” offset. The mapping offset is specified as /MAPPING option’s argument. The field offset is specified as /FIELD option’s argument. The “standard”, mapping, and field offsets can be specified simultaneously. For example, the following zeroes all three declination offsets:

```
DECO 0 /MAPPING 0 /FIELD 0
```

- BEEP, TOANTENNA, TO_DWNCVTR, & TO_SPECTROMETER — the MESSAGE argument must be enclosed by double-quotes if it contains whitespace. For example:

```
TOANTENNA "TEMP F?"
```

- FLSIGNAL & FLWAIT — the antenna digital input and output lines and their values are specified differently. For example, any of the followings sets the output line 8 to high:

```
FLSIGNAL 1 /BIT 7  
FLSIGNAL 128 /MASK 128
```

- OBSERVE — optical pointing check is done by the separate command OPTICAL_POINTING.
- OO_SCAN — parameters are not sticky. The default (sticky) OFF position can be specified using the OFF_POSITION command.
- PLANET — the /JPL_HORIZONS option allows you to generate ephemerides on the fly using the JPL Horizons System.
- POINTING_FILE — optical pointing check is done by the separate command OPTICAL_POINTING. Wild-card listing of known pointing files and the /NONAME_CHANGE option are not available.

6 Features Not Available

The following feature is not available in this release:

- Ability to create and control execution of UIP subprocesses. There is no plan to reinstate this feature as it can be substituted by foreground execution of command procedures (macros).

7 Commands Not Available

The following commands are not available in this release:

- BOLOMETER — removed. The single pixel facility bolometer is no longer supported.
- C — removed due to conflict with SIC’s CONTINUE command. Substituted by the !.
- CALIBRATE — superseded by the FCAL, TCAL, and VANE commands.
- DCL — substituted by the SIC\SYSTEM command.
- DEC2 — superseded by the EQU command.
- DECLINATION — superseded by the EQU command.

- DEFINE — substituted by the SIC\SYMBOL and SIC\@ commands and command procedures (macros).
- DEBUG — not implemented.
- DOPSET — not implemented.
- EXECUTE — not implemented.
- FIX_TIME — not implemented.
- FORGET — removed. Catalog files can be edited directly.
- FS_SCAN — removed. It was a duplicate of the FSWITCH command.
- FTS — superseded by the INSTRUMENT command.
- GB — superseded by the GAL command.
- GET — not implemented.
- GL — superseded by the GAL command.
- GOTO_S — not supported by the SIC.
- GUIDE_STAR_CAT — not implemented.
- HOLD — not implemented.
- INTERPRET — substituted by the SIC\@ command.
- KILL_SUBPROCESS — not implemented.
- LAST_EXECUTION — not implemented.
- LINE — removed. Catalog files can be edited directly.
- LOGON — superseded by the LOG command.
- MAPPER — not implemented.
- NOLOG — superseded by the LOG command.
- OFF_POSITION — renamed to _OFF_POSITION.
- ON_POSITION — renamed to _ON_POSITION.
- PAUSE — not implemented.
- RA — superseded by the EQU command.
- RA2 — superseded by the EQU command.
- RASTER_SCAN — not implemented.
- RESUME — not implemented.
- SBUPDATE — renamed to _NEW_POSITION.
- SOURCE — removed. Catalog files can be edited directly.
- TAKE_DATA — renamed to _TAKE_DATA.
- VIEW_LOG — removed. Log files are always readable.
- XRASTER_SCAN — renamed to RASTER_SCAN.

8 System and User Configuration/Data Files

- Various system default configuration and data files (*e.g.*, pointing files, default catalogs, ephemerides, and logs) are located in `kilauea:/opt/uip`.
- User configuration and data files (*e.g.*, private catalogs and private ephemerides) are located in `kilauea:~/uip`.
- Many files are first searched in the current working directory, next under an appropriate subdirectory in the user file location, then in the system default file location by the new UIP.

9 Catalogs

- Source and line catalogs for the new UIP are in plain text. They are meant to be edited directly using a text editor rather than the `SOURCE`, `LINE`, and `FORGET` commands.
- The format of source catalogs is very similar to the one used by the GILDAS astro program. Below are a few lines from the default source catalog:

```
W30H0UH EQ 1950.00 02:23:16.700 61:38:54.01 LSR -47.40
OR1UH EQ 1950.00 05:32:47.000 -05:24:21.00 LSR 9.00
W51UH EQ 1950.00 19:21:27.001 14:24:30.00 LSR 57.10
S146UH EQ 1950.00 22:47:29.998 59:39:00.01 LSR -49.60
```

- Line catalogs do not contain the default LO multiplication factor. It is instead implied from the receiver in use or specified explicitly using the `LO` command. Below are a few lines from the default line catalog:

```
12C02-1 230.5379700 GHz LSB
12C03-2 345.7959900 GHz USB
12C04-3 461.0408110 GHz LSB
12C06-5 691.4729800 GHz USB
12C07-6 806.6517200 GHz LSB
```

10 Ephemerides

- The format of ephemerides has been changed to closely match to the output of the JPL Horizons System. Below are a few lines from the ephemeris file for Titan:

```
2454832.500000000 11 33 04.8430 +05 08 56.079 9.00952445513056 -29.4049816
2454832.625000000 11 33 05.4242 +05 08 58.749 9.00739372774336 -29.6222299
2454832.750000000 11 33 05.9865 +05 09 01.449 9.00524749734546 -29.8343300
2454832.875000000 11 33 06.5286 +05 09 04.179 9.00308615465248 -30.0407553
2454833.000000000 11 33 07.0492 +05 09 06.937 9.00091012827573 -30.2409828
```

On each line are universal time in JD, apparent, geocentric right ascension in HMS and declination in DMS, range in AU, and range rate in km s^{-1} .

11 Log Files

- Under the original UIP, it was possible to open and append to the most recently used log file. The new UIP always creates a new log file when it is started.

12 UIP Related Services

TCP port numbers of the various UIP related services (*e.g.*, UIP daemon) are unchanged. Only the server address needs to be changed from `alpha1.submm.caltech.edu` to `kilauea.submm.caltech.edu`.

A References

- User Guide for New User Interface Program (pdf)
- Transition Guide for New User Interface Program (pdf)
- SIC Manual (pdf)

B Revision History

- 1.0 (July 1, 2009) HY — Initial release as User Guide.
- 1.1 (July 2, 2009) HY — Added examples for catalogs and ephemerides.
- 1.2 (July 8, 2009) HY — Released as Release Notes. Some contents were moved to new User Guide.
- 1.3 (August 17, 2009) HY — Corrected UIP installation path.
- 1.4 (August 31, 2009) HY — Cosmetic changes.
- 1.5 (September 2, 2009) HY — Removed comment commands.