Description/Introduction

Masterscope has been modified to provide for analysis of files created under the Koto or Lyric/Medley release of LOOPS. A full explanation of Masterscope can be found in the *Lisp Library Modules Manual.* In addition to the relations explained there, LOOPS defines the relations described in this chapter.

Note: Masterscope data base files created under Buttress Loops will not function properly in this release. Those data base files will have to be recreated.

Installation/Loading Instructions

- Load MASTERSCOPE from your Lyric/Medley library floppies according to its loading instructions. This should load the compiled files MASTERSCOPE, MSANALYZE, and MSPARSE.
- Load LOOPSMS.DFASL from wherever you installed the LOOPS Library Modules. This should load versions of MASTERSCOPE and MSPARSE that extend Masterscope to handle LOOPS constructs.

Relations

LOOPS defines the following relations:

Name	Type	Description
SEND	Relation	Collects all places where the method is sent.
SEND SELF	Relation	Collects all places where the method is sent to *self*.
SEND NOTSELF	Relation	Collects all places where the method is sent to an object other than *self*.
GET	Relation	Locates all places where the value of an instance variable is retrieved.
GET CV	Relation	Locates all places where the value of a class variable is retrieved.
PUT	Relation	Locates all places where the value of an instance variable is set.
PUT CV	Relation	Locates all places where the value of a class variable is set.
IMPLEMENT	Relation	Locates all methods that specialize the given selector.
SPECIALIZE	Relation	Locates all methods that specialize the given selector and use ←**Super** in the body of the method.
OVERRIDE	Relation	Locates all methods that specialize the given selector and do not use ←**Super** in the body of the method.

USE IV	Relation	Used with an instance variable name to locate all places where the instance variable is used in a **GET** or **PUT.**
USE CV	Relation	Used with a class variable name to locate all places where the class variable is used in a **GET** or **PUT.**
USE OBJECT	Relation	Used with an object name to locate all places where the object is used**.**

SEND [Relation]

Purpose/Behavior: Used between method names and selectors to collect all places where the method is sent. For example, the form

```
. WHO IS SENT BY 'Helicopter.Move
```

works, but

```
. WHO IS SENT BY Move
```

does not work.

Example: The following command allows you to edit all code that sends the message **New**.

```
. EDIT ALL WHO SEND New
```

SEND SELF [Relation]

Purpose/Behavior: Used between method names and selectors to collect all places where the method is sent to *self*. Places where

(← *self methodName*)

is found are collected, while places where

(← *otherInstance methodName*)

is found are not.

Example: The following command allows you to edit all code that sends the message **Clear** to self.

```
. WHO SENDS SELF Clear
```

SEND NOTSELF [Relation]

Purpose: Same as **SEND SELF**, except the only places where the message is sent to an object other than *self*.

Example: The following allows you to edit all code that sends the message **Clear** to any instance other than *self*.

```
. SHOW ALL WHO SEND NOTSELF Clear
```

GET [Relation]

Purpose: Used with an instance variable name to locate all places where the value of the instance variable is retrieved. This relation can be used along with the **SELF** and **NOTSELF** modifiers.

Example: This command allows you to edit all code that gets the value of the instance variable **width** from an instance other than self and the value of the instance variable **height** from *self*.

```
. SHOW ALL WHO GET NOTSELF width AND GET SELF height
```

GET CV [Relation]

Purpose: Same as **GET**, except that **GET CV** locates places where the value of the class variable is retrieved. This relation can be used with the **SELF** and **NOTSELF** modifiers.

Example: This command allows you to edit all code that accesses the value of the class variable **height** of *self*.

```
. SHOW ALL WHO GET CVSELF height
```

PUT [Relation]

Purpose: Used with an instance variable name to locate all places where the value of the instance variable is set. This relation can be used along with the **SELF** and **NOTSELF** modifiers.

Example: This command allows you to edit all code that sets the value of the instance variable **width.**

```
. EDIT ANY WHO PUT width
```

PUT CV [Relation]

Purpose: Same as **PUT**, except locates places where a specified class variable is set. This relation can be used along with the **SELF** and **NOTSELF** modifiers.

Example: This command list all the sections of code that set the value of the class variable **width** for an instance other than *self*.

```
. WHO PUTS CV NOTSELF width
```

IMPLEMENT [Relation]

Purpose: Used with a method name to locate all methods that specialize the given selector.

Example: This returns a list of classes where the method **Clear** is defined.

```
. WHO IMPLEMENTS Clear
```

SPECIALIZE [Relation]

Purpose: Used with a method name to locate all methods that specialize the given selector and use ←**Super** in the body of the method.

Example: This command allows you to edit all the methods that are specializations of **Clear** and use the ←**Super** form.

```
. EDIT ANY WHO SPECIALIZE Clear
```

OVERRIDE [Relation]

Purpose: Like **SPECIALIZE** above, except it locates all methods that specialize the given selector and ←**Super** is not used in the body of the method.

Example: This command allows you to edit all the specializations of **Clear** that do not make use of the ←**Super** form.

```
. EDIT ALL WHO OVERRIDE Clear
```

USE IV [Relation]

Purpose: Used with an instance variable name to locate all places where the instance variable is used in a **Get** or **Put**. It is equivalent to using the relation form of **GET IVName** or **PUT IVName**.

Example: This command allows you to edit all code that either sets or accesses the instance variable **width**.

```
. EDIT ANY WHO USE THE IV width.
```

USE CV [Relation]

Purpose: Used with a class variable name to locate all places where the class variable is used in a **Get** or **Put**. It is equivalent to using the relation form: **GET CV CVName OR PUT CV CVName**.

Example: This command allows you to edit all code where the class variable **commonWindow** is either set or accessed.

```
. EDIT ANY WHO USE THE CV commonWindow
```

USE OBJECT [Relation]

Purpose Uses an object name to locate all places where the object is used.

Example This command returns a list of all code where the object **Window** is used.

```
. WHO USES THE OBJECT Window??
```

Limitations

Masterscope has several limitations:

- Names of methods must be quoted when used with Masterscope; for example, the method name Helicopter.Move must be entered as 'Helicopter.Move.
- The following expression will not find a call to **GetValue** when in a method:

  ```
  . WHO CALLS GetValue
  ```

  Masterscope does not record calls to **GetValue** and **PutValue** explicitly; it records them under the Get- relation along with calls of the form

  ```
  (← foo Get 'bar)
  ```

  Similarly, the following functions are recorded under relations instead of their names:

GetClassValue	Get CV
PutClassValue	Put CV
GetClassIV	Get IV
PutClassIV	Put IV

If you want to find the explicit calls to Get/PutValue, use

```
. WHO GETS ANY AND NOT SENDS Get
```

- Masterscope currently assumes calls to **GetValue** and similar accessors are accessing instance variables; i.e.,

  ```
  (GetValue foo 'bar)
  ```

  records an access to the instance variable **bar**. This is not necessarily the case; **bar** could also be a class variable.

- The methods and functions that create class and instance variables populate the appropriate **PUT NOTSELF** relations. For example, a function that does

  ```
  (←($ foo) AddCV 'bar)
  ```

  will be found by the query

  ```
  . WHO PUTS CV NOTSELF 'bar
  ```

  An exception occurs with the generalized **Add** and **Delete** method. For example,

  ```
  ($ foo) Add 'IV 'bar)
  ```

  will not be noticed as accessing the instance variable **bar**.

  Also, the templates for methods and functions that accept property lists generally only notice the first property. For example,

  ```
  ((←($ foo) NewWithValues '(bar baz chain link
  sausage)))
  ```

  notices **baz** as a property, not a link.

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