

# The mparrows METAPOST module



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## 1 Introduction

This MetaPost module provides some different types of arrow heads for use with the `drawarrow` and `drawdblarrow` commands.

## 2 Usage

To load the `mparrows` module put the following line into the start of your MetaPost file:

```
input mparrows;
```

## 3 The new arrow types

The new arrows are defined with the same parameters as the original MetaPost arrows; `ahlength` and `ahangle`.

### 3.1 The original arrows of METAPOST

To the right the original arrows of MetaPost are shown.

They are shown here mostly for comparison. The picture is as most of the other pictures scaled by five. To use the original arrows type

```
setarrows(orig);
```



### 3.2 The default arrows of the mparrows module

The default arrow of the mparrows module look similar to the original arrows of MetaPost.

However there is a little difference. See section 5 on page 5.

To use the default arrows type

```
setarrows ( default ) ;
```

or do nothing – it's default.



### 3.3 Unfilled arrow heads

Arrows just with the same outline as the default arrows but not filled.

To use the unfilled default arrows type

```
setarrows ( defaultunfilled ) ;
```



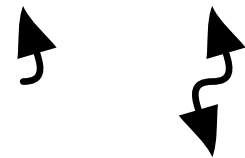
### 3.4 Sharp arrow heads

Arrows just with the same path for the arrow head as the default arrows but only filled – the outline is not drawn.

The tip of the arrow is exactly at the end of the path.

To use the sharp default arrows type

```
setarrows ( defaultsharp ) ;
```

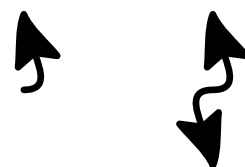


### 3.5 Barbed arrows

With the same 'outer' lines as the default arrow but the back of the arrow head has barbs.

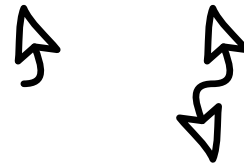
To use the barbed arrows type

```
setarrows ( barbed ) ;
```



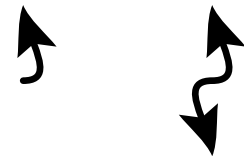
### 3.6 Unfilled barbed arrows

The barbed arrow unfilled.  
To use the unfilled barbed arrows type  
`setarrows (barbedunfilled)` ;



### 3.7 Sharp barbed arrows

The barbed arrow sharp.  
To use the sharp barbed arrows type  
`setarrows (barbedsharp)` ;



### 3.8 Open arrowheads

With the same 'outer' lines as the default arrow but  
the back of the arrow head is not drawn.  
To use the open arrows type  
`setarrows (open)` ;



## 4 The barbed arrows

The barbed arrows are configured via the  
**barbedarrowindent** value. **barbedarrowindent**  
is the ratio of the inner diameter of the barbed arrows  
(green circle) to the outer diameter of the barbed  
arrows (red circle).

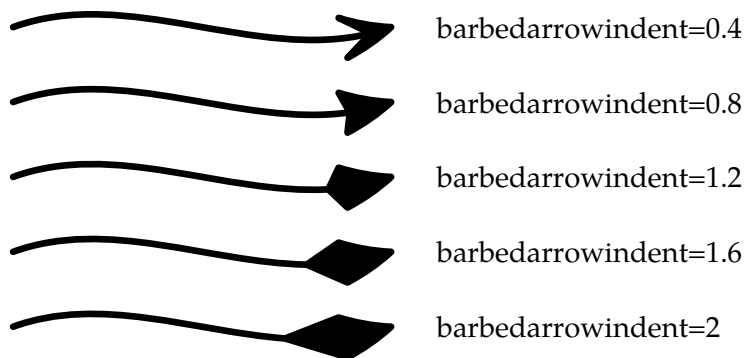


The **barbedarrowindent** value is set with

`barbedarrowindent := .6` ;

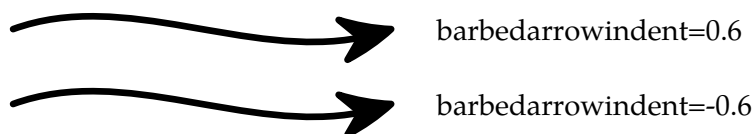
Below arrows with different values of **barbedarrowindent** are displayed.





#### 4.1 Negative values

As the arrows are defined using circles negative values of **barbedarrowindent** gives the same as the positives.



## 5 The difference between the original and the default arrows

The only (and invisible) difference between the original arrows of MetaPost and the default arrows of the `mparrows` module is how the path is drawn:

In the original definition the path is drawn as normal.

In the `mparrows` default the path is cut after the arrow head. This allows for making the arrow heads unfilled (see section 3.3) or sharp (see section 3.4).



## 6 Copyright and license

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