

---

Stream: Independent Submission  
RFC: [9402](#)  
Category: Informational  
Published: 1 April 2023  
ISSN: 2070-1721  
Authors: M. Basaglia J. Bernards J. Maas

# RFC 9402

## Concat Notation

---

### Abstract

This document defines the Concat notation: a text-based language used to describe pictures and videos whose subject includes cats, containers, and their interactions.

### Status of This Memo

This document is not an Internet Standards Track specification; it is published for informational purposes.

This is a contribution to the RFC Series, independently of any other RFC stream. The RFC Editor has chosen to publish this document at its discretion and makes no statement about its value for implementation or deployment. Documents approved for publication by the RFC Editor are not candidates for any level of Internet Standard; see Section 2 of RFC 7841.

Information about the current status of this document, any errata, and how to provide feedback on it may be obtained at <https://www.rfc-editor.org/info/rfc9402>.

### Copyright Notice

Copyright (c) 2023 IETF Trust and the persons identified as the document authors. All rights reserved.

This document is subject to BCP 78 and the IETF Trust's Legal Provisions Relating to IETF Documents (<https://trustee.ietf.org/license-info>) in effect on the date of publication of this document. Please review these documents carefully, as they describe your rights and restrictions with respect to this document.

## Table of Contents

1. Introduction
  - 1.1. Conventions Used in This Document
2. Definition
  - 2.1. Terminology
  - 2.2. Grammar
3. Elements
  - 3.1. Subjects
    - 3.1.1. Cats
    - 3.1.2. Partial Cats
    - 3.1.3. Other Animals
    - 3.1.4. Balls of Yarn
  - 3.2. Containers
  - 3.3. Positioning
    - 3.3.1. Horizontal Position
    - 3.3.2. Vertical Position
    - 3.3.3. Multiple Repeated Objects
  - 3.4. Changes over Time
    - 3.4.1. Disambiguation
4. Internationalization Considerations
5. Security Considerations
6. IANA Considerations
7. Normative References
- Appendix A. Examples
- Authors' Addresses

## 1. Introduction

Cat pictures and videos are often shared across the Internet. Many of these files display feline subjects interacting with boxes and other containers.

Since there is currently no compact notation for describing such media, this document details a standard notation to describe the position and interaction of cats, containers, and related subjects pictured in these images.

The notation language described in this document is text-based and limits itself to the US-ASCII character encoding [RFC0020], allowing the transfer of cat-related materials in environments with restricted capabilities.

### 1.1. Conventions Used in This Document

The key words "MUST", "MUST NOT", "REQUIRED", "SHALL", "SHALL NOT", "SHOULD", "SHOULD NOT", "RECOMMENDED", "NOT RECOMMENDED", "MAY", and "OPTIONAL" in this document are to be interpreted as described in BCP 14 [RFC2119] [RFC8174] when, and only when, they appear in all capitals, as shown here.

## 2. Definition

### 2.1. Terminology

This document uses specific terms to refer to items being depicted by the notation described herein.

To avoid ambiguity, such terms are defined as follows:

**Subject:** The term "subject" is used in this document to refer to the object that is the focus in the media to be annotated. This usually is an animate object, specifically a cat. An annotation can have multiple subjects interacting in various ways.

**Cat:** A cat is a special kind of subject of feline origin. This document will assume a house cat is present in the source media; however, other felines are also acceptable.

**Container:** The term "container" is used to refer to inanimate objects inside of which one or more subjects can be located. Most commonly, this will be a cardboard box; however, a variety of containers can be used.

### 2.2. Grammar

The grammar is defined using the ABNF notation [RFC5234].

```

SEQUENCE = POSITION / POSITION "=>" SEQUENCE
POSITION = ADJACENT
ADJACENT = OVER / ADJACENT "+" OVER
OVER = MULTIPLE / MULTIPLE "/" POSITION
MULTIPLE = CONCAT / NUMBER [ "*" ] MULTIPLE / NUMBER "/" MULTIPLE
CONCAT = SUBJECT [ NUMBER ] / [ PARTIAL ] CONTAINER [ PARTIAL ]
CONTAINER = "[" OPT-POS "]" / "(" OPT-POS ")"
CONTAINER =/ "{" OPT-POS "}" / "<" OPT-POS ">"
OPT-POS = [ POSITION ]
SUBJECT = CAT / 1*ALPHA / "@"
CAT = "cat" / PARTIAL
PARTIAL = "c" / "a" / "t" / "ca" / "at"
ALPHA = %x41-5A / %x61-7A
NUMBER = 1*DIGIT
DIGIT = "0" / "1" / "2" / "3" / "4"
DIGIT =/ "5" / "6" / "7" / "8" / "9"

```

## 3. Elements

### 3.1. Subjects

#### 3.1.1. Cats

The standard notation for a cat is the word `cat`.

#### 3.1.2. Partial Cats

When referencing cats partly inside a container, the annotation **MUST** contain the full cat mark adequately split inside and outside the container.

If a cat is only partly visible in the frame of the picture or video, the annotation **MAY** only reference the visible portion of the cat.

The partial cat notations are as follows:

- c: marks the head of the cat.
- a: marks the body of the cat.
- t: marks the tail of the cat.
- ca: marks the head and body of the cat.
- at: marks the body and tail of the cat.

The annotation for a partial cat **SHOULD** use the terms mentioned above that best describe the portion of the cat that is being referenced.

### 3.1.3. Other Animals

Other animals or animate objects **SHOULD** be represented with a suitable word describing the species of such animal. The cat-specific words described in this document **MUST NOT** be used for non-feline subjects.

### 3.1.4. Balls of Yarn

Balls of yarn **SHOULD** be represented with @.

## 3.2. Containers

When a cat or other subject is inside a container, the container notation **MUST** be used. Such notation is denoted by its subject being between brackets. The type of bracket depends on the shape of the container as follows:

- Square brackets represent boxes or other containers with a rectangular opening.
- Parentheses represent containers with a round opening or shape.
- Curly braces **SHALL** be used to represent soft containers without a fixed shape.

Additionally, angle brackets **MAY** be used to group subjects outside a container. Such annotations **MUST NOT** contain partial cats.

## 3.3. Positioning

The Concat notation only gives information about the general layout of subjects and containers, but it does make a distinction between horizontal and vertical positions.

The order of positional operands **SHOULD** follow the order in which they appear from left to right in the source media.

### 3.3.1. Horizontal Position

The + operator is used to represent subjects or containers next to each other.

### 3.3.2. Vertical Position

When a subject is above or on top of another, the operator / **MUST** be used.

### 3.3.3. Multiple Repeated Objects

When multiple objects or configurations are repeated, the shorthand notation **MAY** be used.

Horizontal positioning is denoted by a number followed by an optional \* and the annotation to be repeated.

Similarly, for vertical positioning, repeated objects are denoted by a number followed by / and the annotation to be repeated.

When using such a shorthand, the number of repetitions **MUST** be a positive integer.

### 3.4. Changes over Time

In the case of videos or other animations, a proper Concat notation **SHOULD** make use of the state change operator ( $=>$ ) to mark significant changes in the cat position and major interactions.

#### 3.4.1. Disambiguation

Subject tokens **MAY** be followed by an integer identifier to distinguish specific cats, balls of yarn, or other subjects. An annotation containing such numeric disambiguations **MUST** contain such disambiguations for all cats and balls of yarn.

Since a specific subject can only appear once in a static image, disambiguation identifiers **SHOULD** be used only on annotations showing state changes.

## 4. Internationalization Considerations

The word cat is in English and is provided to allow transfer of Concat notations using only the US-ASCII character encoding [RFC0020].

Users of other languages **MAY** extend the alphabet and use their localized words for cat and other animals.

Non-standard words for cats **SHOULD NOT** be used unless all parties involved in the production and consumption of the Concat notation have agreed upon a character encoding and a language prior to the transmission of the annotation.

## 5. Security Considerations

A cat might find themselves in a container smaller than the perceived volume of the cat. While this might seem to be a dangerous situation, it's actually a natural occurrence when the cat is in its liquid form.

Cats might chew on the cardboard of the box containing them. To mitigate this attack, we recommend having multiple boxes to put the cats into.

## 6. IANA Considerations

This document has no IANA actions.

## 7. Normative References

- [RFC0020] Cerf, V., "ASCII format for network interchange", STD 80, RFC 20, DOI 10.17487/RFC0020, October 1969, <<https://www.rfc-editor.org/info/rfc20>>.

- [RFC2119] Bradner, S., "Key words for use in RFCs to Indicate Requirement Levels", BCP 14, RFC 2119, DOI 10.17487/RFC2119, March 1997, <<https://www.rfc-editor.org/info/rfc2119>>.
- [RFC5234] Crocker, D., Ed. and P. Overell, "Augmented BNF for Syntax Specifications: ABNF", STD 68, RFC 5234, DOI 10.17487/RFC5234, January 2008, <<https://www.rfc-editor.org/info/rfc5234>>.
- [RFC8174] Leiba, B., "Ambiguity of Uppercase vs Lowercase in RFC 2119 Key Words", BCP 14, RFC 8174, DOI 10.17487/RFC8174, May 2017, <<https://www.rfc-editor.org/info/rfc8174>>.

## Appendix A. Examples

This appendix provides some examples of the Concat notation.

```
[cat]
```

*Figure 1: A Cat in a Box*

```
[cat] + cat
```

*Figure 2: A Cat in a Box Next to a Cat Not in a Box*

```
cat / [cat]
```

*Figure 3: A Cat over a Box Containing Another Cat*

```
[c]at
```

*Figure 4: A Cat with Its Head inside a Box*

```
3 * cat
```

*Figure 5: 3 Cats Side by Side*

```
3 / cat
```

*Figure 6: 3 Cats on Top of Each Other*

```
cat + cat / [cat]
```

*Figure 7: A Cat Standing Next to a Box That Has a Cat on Top and inside of It*

```
<cat + cat> / [cat]
```

*Figure 8: Two Cats Standing on a Box with Another Cat inside of It*

```
cat1 + [cat2] => cat2 + [cat1]
```

*Figure 9: A Cat inside a Box and a Cat outside Swap Places*

## Authors' Addresses

### **Mattia Basaglia**

Email: [glax@dragon.best](mailto:glax@dragon.best)

URI: <https://dragon.best/>

### **Joep Bernards**

Email: [joep@duali.xyz](mailto:joep@duali.xyz)

### **Joost Maas**

Email: [J.f.w.maas@tue.nl](mailto:J.f.w.maas@tue.nl)