



Drawing diagrams using the chart module

Alan BRASLAU

Service de physique de l'état condensé, CEA/Saclay, France

Brejlov – 15/09/2010

Diagrammatic information



*ideas, concepts,
actions, objects, ...*

*state or process
descriptions*

*hierarchical relationships
and connections*

visual identification

Batman!





- ideas, concepts, actions, objects, ...
- hierarchical relationships and connections
- state or process descriptions
- visual identification

Diagram types

- ▷ tree diagram
- ▷ flow chart
- ▷ block diagram
- ▷ network diagram
- ▷ Venn diagram
- ▷ existential graph
- ▷ truth table
- ▷ geographical map
- ▷ timeline
- ▷ state diagram ...

Diagrammatic information



*ideas, concepts,
actions, objects, ...*

*state or process
descriptions*

*hierarchical relationships
and connections*

visual identification

Symmetry — Montesquieu, *Essai sur le goût*, 1757



“I have said that the soul loves variety; yet in most things one would like to recognize some sort of symmetry. This appears to present somewhat of a contradiction that I shall now explain:

When we perceive object, one of the principal sources of pleasure to our soul lies in our ease of recognition; And the reason that makes symmetry pleasant to our soul is that it spares us pain, that it soothes, that it, one can say, cuts our labor by half.

From this follows a general rule: wherever symmetry is useful to the soul and can help it function, it is pleasant; yet everywhere where it is not useful, it is insipid because it removes variety. But things that we see in succession must vary, because our soul has no difficulty to perceive them; those that we observe fleetingly, on the other hand, must have symmetry. Thus, as we glimpse at a building, garden, or a temple, we add symmetry, as this pleases the soul by the ease with which we can grasp at once the wholeness of the object.

As the object that we perceive at a glance must be simple, it must have unity and all of its parts must be related to the essence of the object itself: it is for this reason again that we like symmetries; for symmetry makes a whole.

It is natural that this whole be complete, and the soul that perceives this whole wishes that no part be imperfect. It is yet another reason why we like symmetries: there must be some sort of weight or balance; and a building having only one wing, or one wing shorter than another, is just as unfinished as a body having only one arm, or having one arm shorter than the other.”

2D Symmetry

We are accustomed to the use of grids and tables,
but there are, in fact:

- 17 space groups
- 5 lattice types:
 1. triangular (hexagonal)
 2. square
 3. rectangular
 4. rhombic
 5. parallelogram

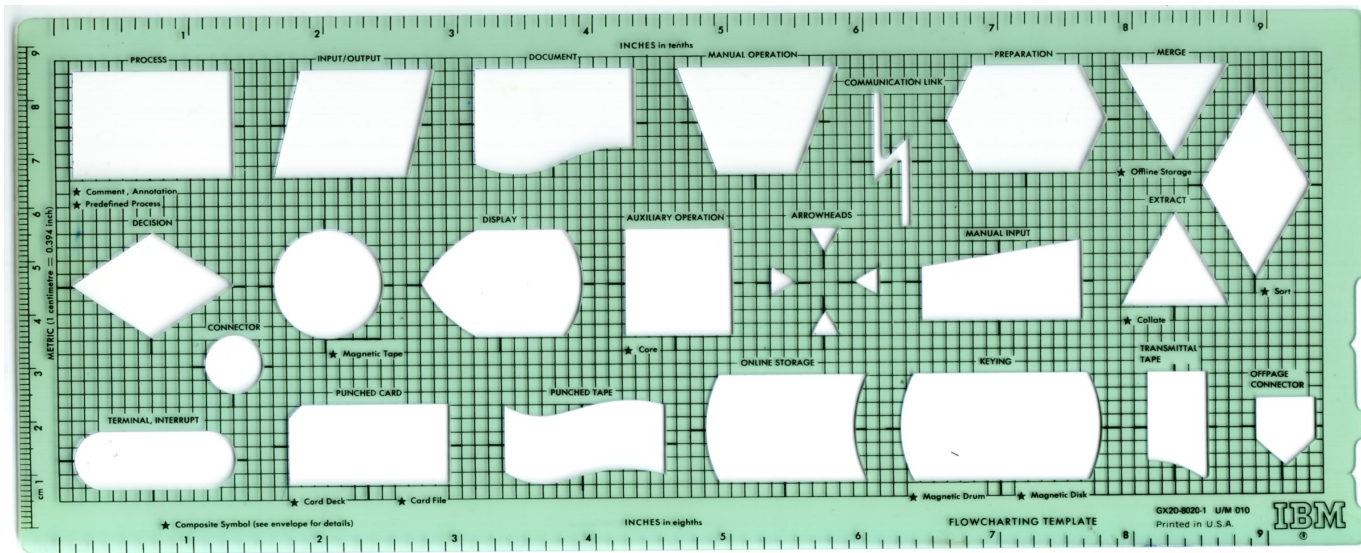


M. C. Escher, Plane Filling II, 1957

How to draw diagrams (in ConTeXt)?



- **nodes** in pgf/TiKz (see also tikz-qtree)
- METAPOST? (e.g. trees.mp)
- `\usemodule [chart]` (flowcharts)



flowchart worksheet



IBM Flowcharting Worksheet

PRINTED IN U.S.A.
920-999-11

Programmer: _____ Chart Name: _____ Program No.: _____ Date: _____
Chart ID: _____ Chart Name: _____ Program Name: _____ Page: _____

A1	A2	A3	A4	A5
B1	B2	B3	B4	B5
C1	C2	C3	C4	C5
D1	D2	D3	D4	D5
E1	E2	E3	E4	E5
F1	F2	F3	F4	F5
G1	G2	G3	G4	G5
H1	H2	H3	H4	H5
J1	J2	J3	J4	J5
K1	K2	K3	K4	K5

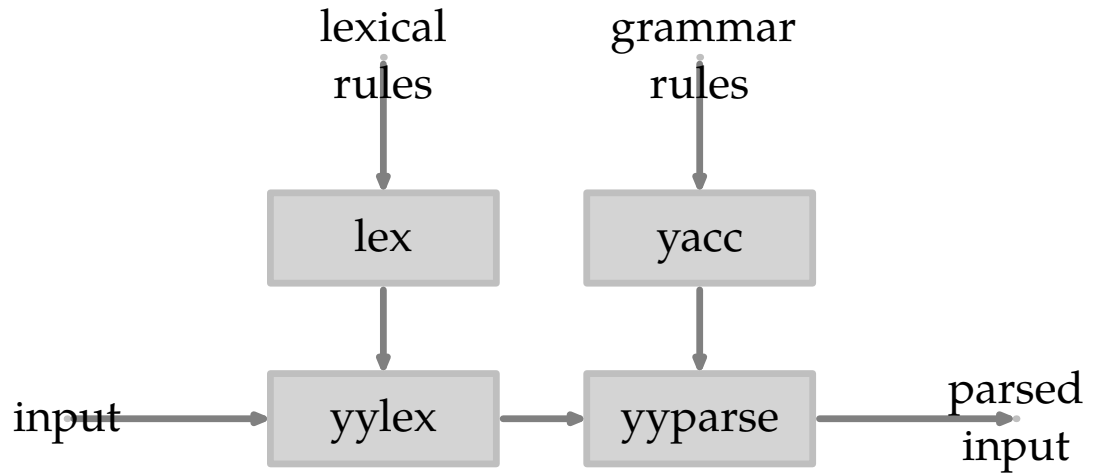
IBM Flowcharting Worksheet

PRINTED IN U.S.A.
920-999-11

Programmer: _____ Chart Name: _____ Program No.: _____ Date: _____
Chart ID: _____ Chart Name: _____ Program Name: _____ Page: _____

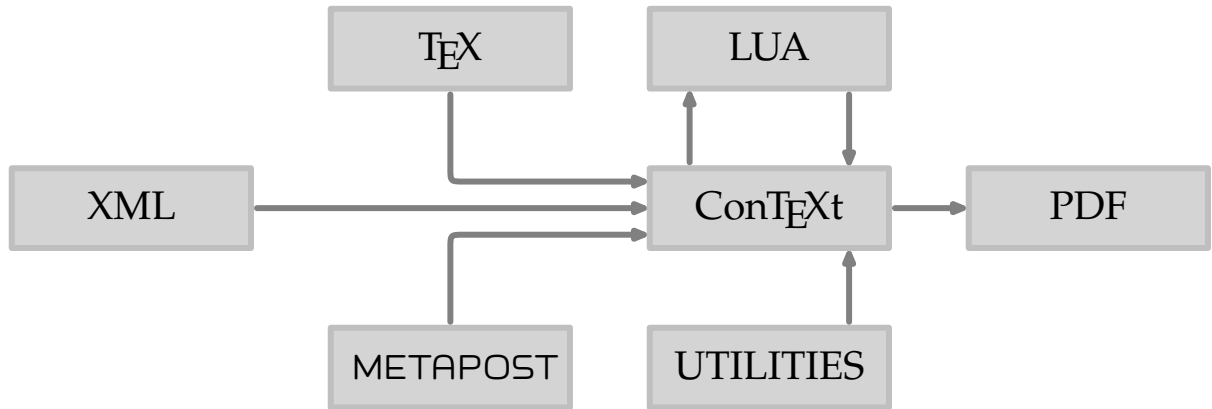
A1	A2	A3	A4	A5
B1	B2	B3	B4	B5
C1	C2	C3	C4	C5
D1	D2	D3	D4	D5
E1	E2	E3	E4	E5
F1	F2	F3	F4	F5
G1	G2	G3	G4	G5
H1	H2	H3	H4	H5
J1	J2	J3	J4	J5
K1	K2	K3	K4	K5

Language development tools



S. C. Johnson and M. E. Lesk, The Bell System Technical Journal, 57 (1978) 2155-2175

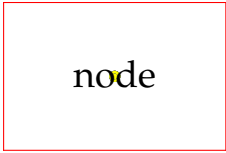

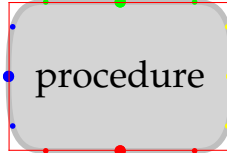

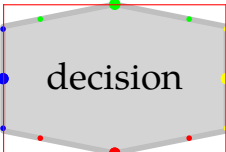

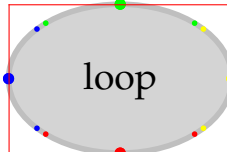
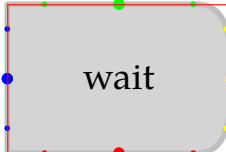
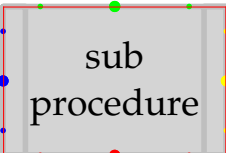
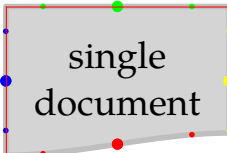
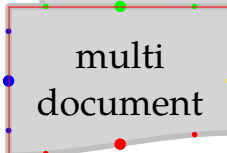
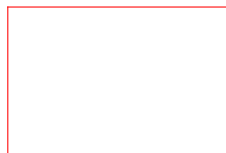
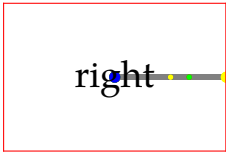
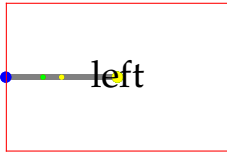
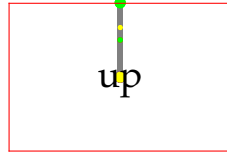
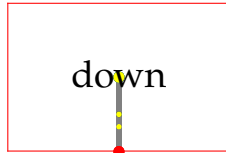
MKIV is a hybrid system



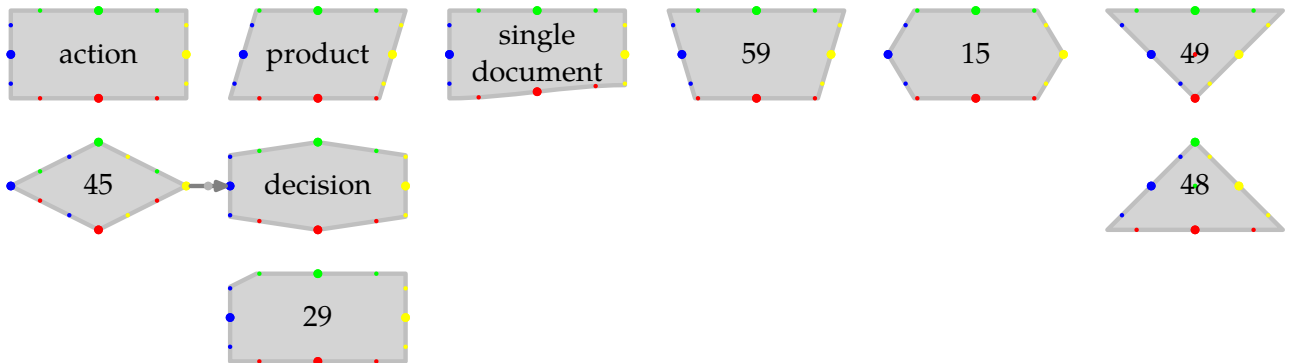
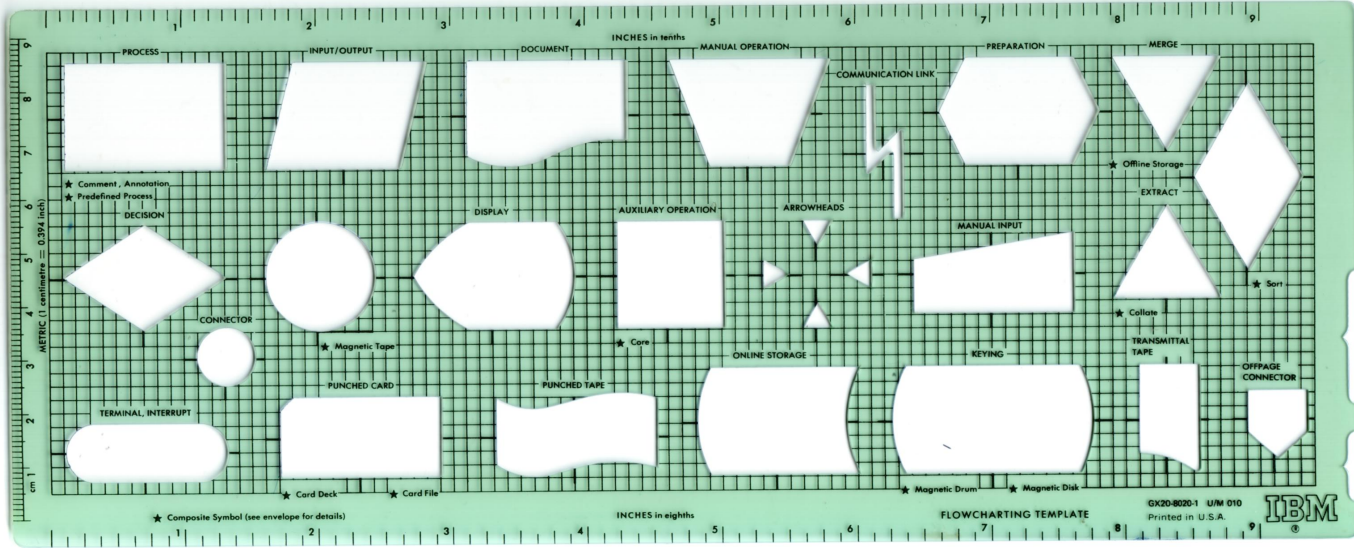
MkIV Hybrid Technology, Hans Hagen

basic shapes

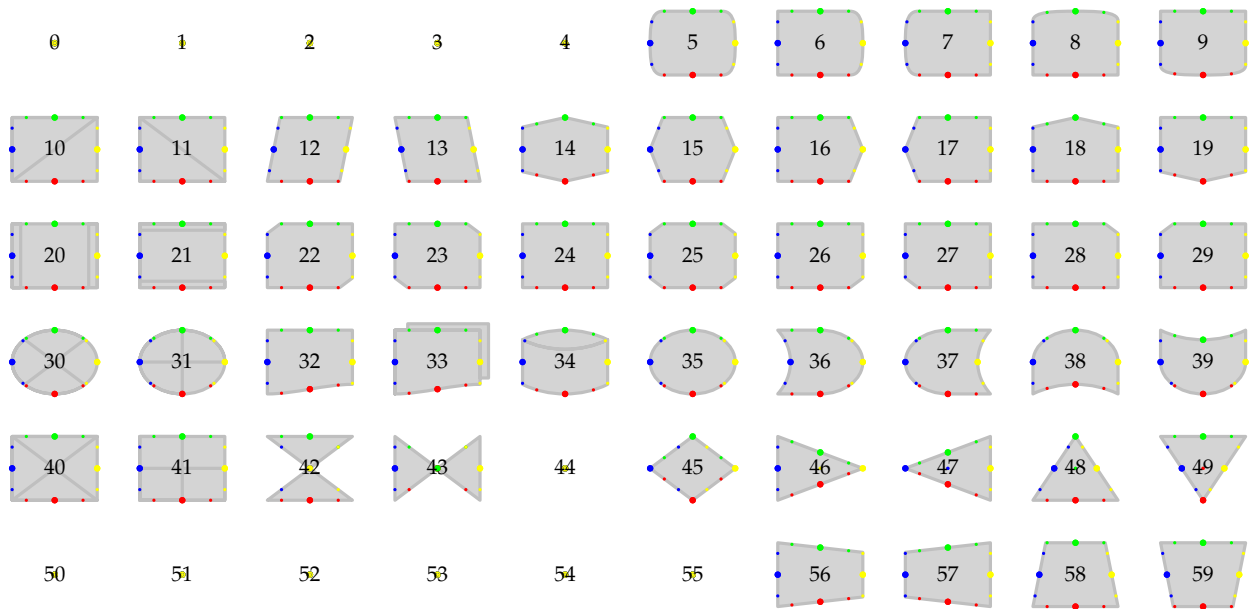


	1	2	3	4
1	 <p>node</p>	 <p>action</p>	 <p>procedure</p>	 <p>product</p>
2	 <p>decision</p>	 <p>archive</p>	 <p>loop</p>	 <p>wait</p>
3	 <p>sub procedure</p>	 <p>single document</p>	 <p>multi document</p>	
4	 <p>right</p>	 <p>left</p>	 <p>up</p>	 <p>down</p>

basic shapes

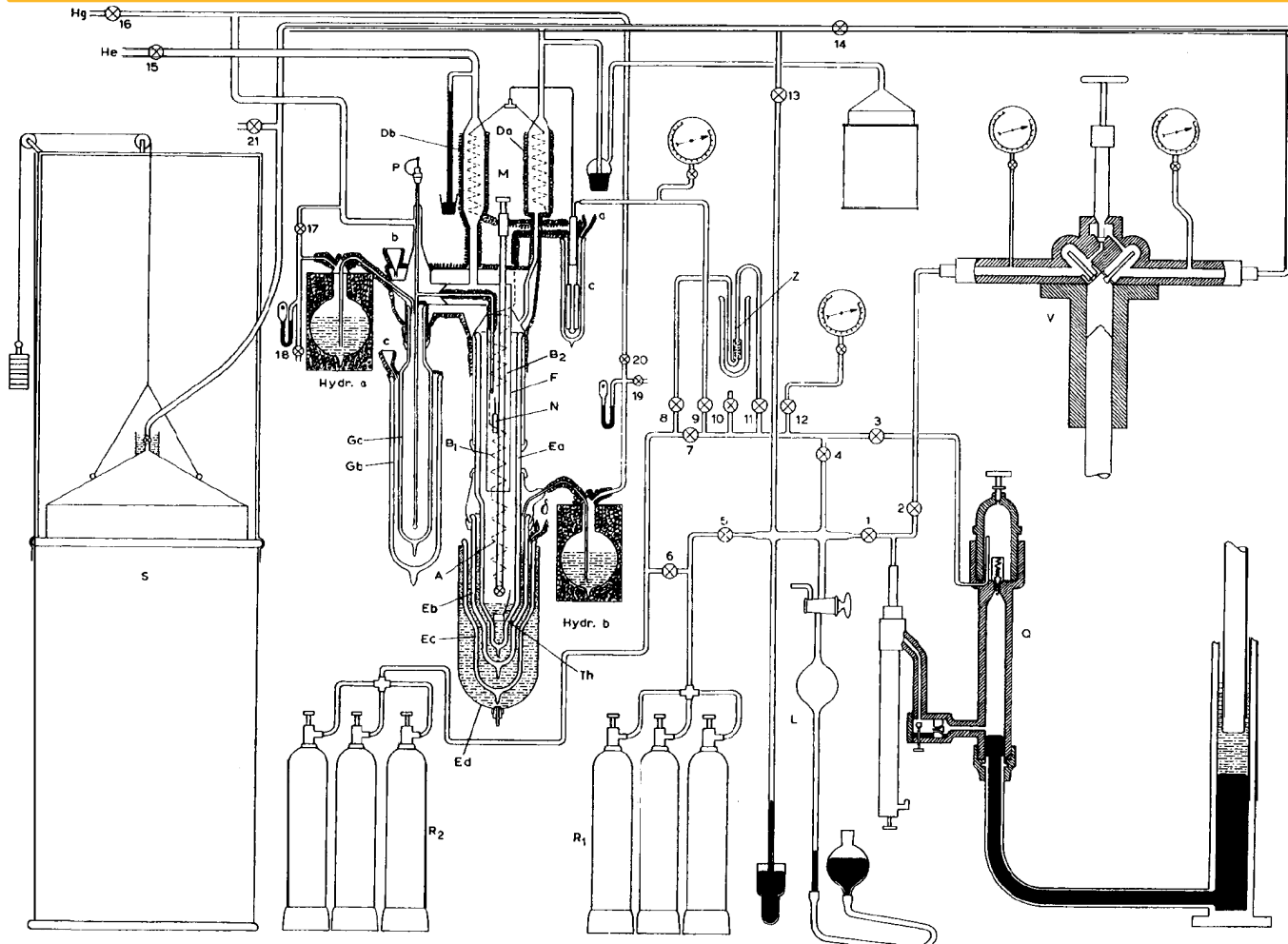


numbered shapes

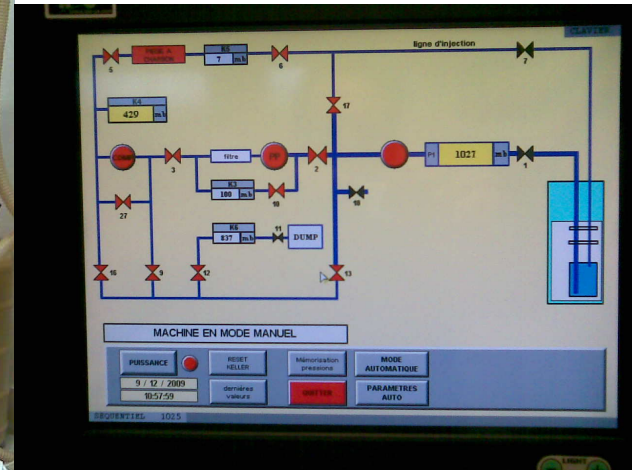


- It would be nice to name all of the shapes.
- What about filling in the missing shapes?
- Simple tools to define new custom shapes.

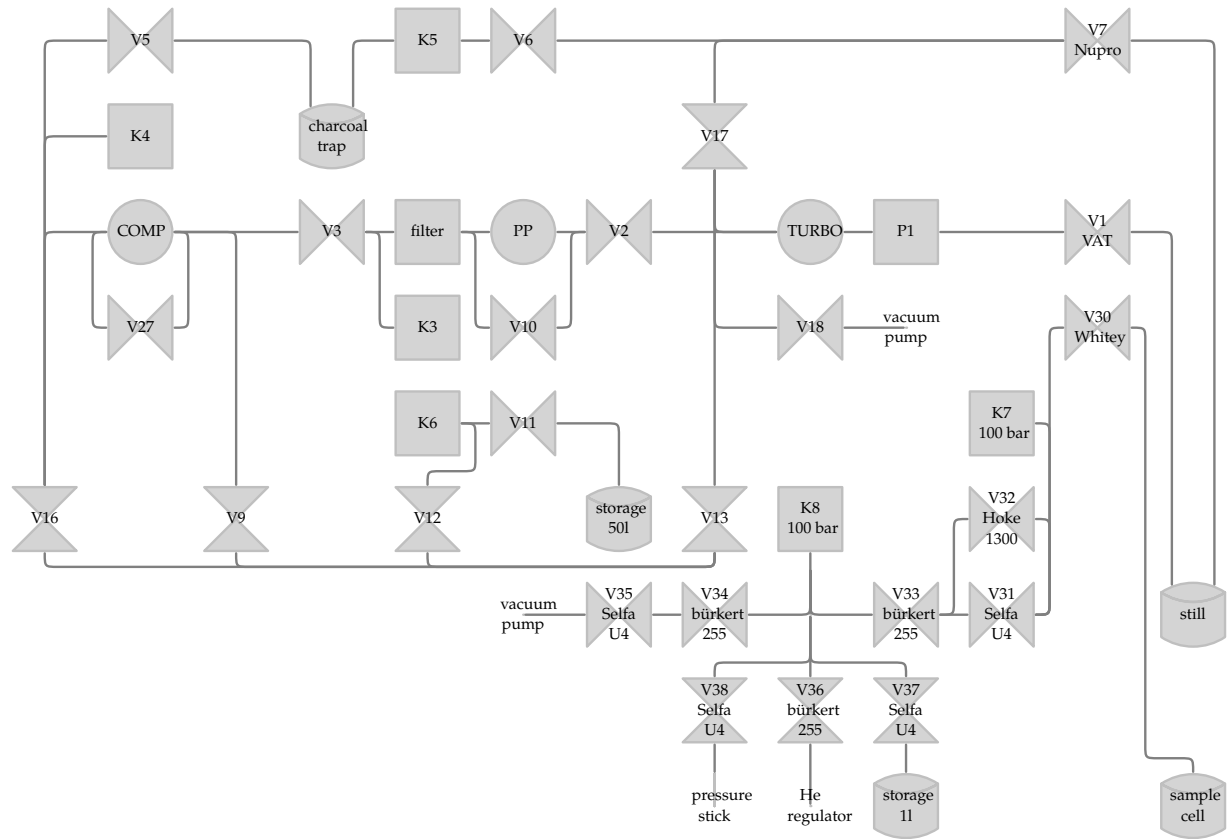
Heike Kamerlingh Onnes, Nobel Lecture, December 11, 1913



Dilution refrigerator, gas handling system



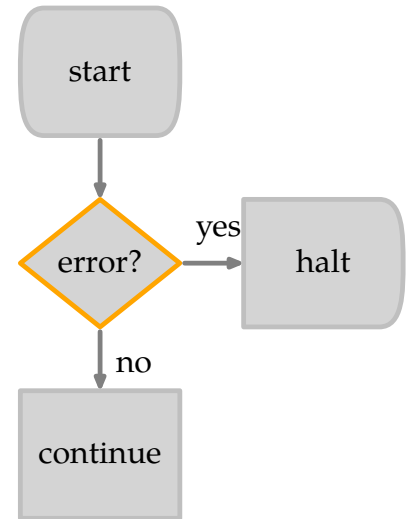
Dilution refrigerator, gas handling system



Generalization of the chart module

- logical (relative) positioning

```
\startFLOWcell
  \name {error}
  \shape {decision}
  \text {error?}
  \location [b] {start}
  \location [l] {halt}
  \connection [rl] {halt}
  \connection [bt] {continue}
\stopFLOWcell
```



- individual cell attributes
(scale, color, ...)
- row and column dimensions could be variable, based on the space needed.
- other lattice types:
triangular (tree diagrams), rhombic, parallalogram
- better (ConT_EXt) syntax?