Local anchors

The mechanism described here is still experimental. Although it could be implemented in MkIV it is only available in LMTX. Already early in MkII we had a positioning mechanism available. At that time we had dvi output and specials were used to track positions. A script calculated the positions that were then fed back into the second run. Later Taco wrote dvipos which sped up the analysis. 7 When pdfT_EX evolved, an equivalent positioning mechanism was added there. In MkIV positioning support was optimized as part of the upgrading process a bit but the principles remained the same. The mechanism discussed here works differently and is more local which has pros and cons: it saves a second pass but it in only works in a boxed $ConT_EXt$ (or course one can unbox a vertical box in the large main stream). Performance wise there is probably not much difference (if one 13 discards the initial extra run).

There is not that much to tell about it and examples demonstrate best what can be done with it.

\framed [synchronize=yes,align=normal] {%
 test test test 1 \sync{one}{1}test test 2 \crlf
 test test 1 \sync{one}{1}test test 2 \crlf
 test 1 \sync{one}{1}test 2 \crlf
 test test test test 1 \sync{one}{1}test 2
}

Here we see four anchors being used. The one is just a namespace and the number is a column number.

test	test	test	1		test	test	2	
test	test	1			test	test	test 2	
test	1				test	2		
test	test	test	test	1	test	test	2	

Here we have two columns:

\framed [synchronize=yes,align=normal] {%
 one one \sync{a}{1}two \sync{a}{2}three \crlf
 one one \sync{a}{1}two two \sync{a}{2}three \crlf
 one \sync{a}{1}two \sync{a}{2}three \crlf
 one one one \sync{a}{1}two \sync{a}{2}three
}

There are not really columns in the tabular sense but the anchor points perform41the same duty as cell separators in a table.42

				45
one one	two	three		44
one one	two two	three		45
one	two	three		46
one one one	two	three		47
The Sunc c	ommand	mote a	column number but will sutomatically increment a	

40

<pre>\framed [synchronize=yes,align=normal] {% \syncanchor{one}{1}{1}A \syncanchor{one}{2}{1}BBB \syncanchor{one}{3}{1}C \crlf \syncanchor{one}{1}{2}AA \syncanchor{one}{3}{2}C \crlf \syncanchor{one}{1}{3}AAA \syncanchor{one}{1}{3}BB \syncanchor{one}{2}{3}BB \syncanchor{one}{3}{3}C } Here a cell is missing which is why we are more explicit with the coord A BBB C AA C</pre>	linates.
<pre>\framed [synchronize=yes,align=normal] {% \syncanchor{one}{1}{1}A \syncanchor{one}{2}{1}BBB \syncanchor{one}{3}{1}C \crlf \syncanchor{one}{1}{2}AA \syncanchor{one}{3}{2}C \crlf \syncanchor{one}{1}{3}AAA \syncanchor{one}{1}{3}BB \syncanchor{one}{2}{3}BB \syncanchor{one}{3}{3}C } Here a cell is missing which is why we are more explicit with the coord A BBB C AA C</pre>	linates.
<pre>\syncanchor{one}{1}{1}A \syncanchor{one}{2}{1}BBB \syncanchor{one}{3}{1}C \crlf \syncanchor{one}{1}{2}AA \syncanchor{one}{3}{2}C \crlf \syncanchor{one}{1}{3}AAA \syncanchor{one}{2}{3}BB \syncanchor{one}{2}{3}BB \syncanchor{one}{3}{3}C } Here a cell is missing which is why we are more explicit with the coord A BBB C AA C</pre>	linates.
\syncanchor{one}{2}{1}BBB \syncanchor{one}{3}{1}C \crlf \syncanchor{one}{1}{2}AA \syncanchor{one}{3}{2}C \crlf \syncanchor{one}{1}{3}AAA \syncanchor{one}{2}{3}BB \syncanchor{one}{2}{3}BB \syncanchor{one}{3}{3}C } Here a cell is missing which is why we are more explicit with the coord A BBB C AA C	linates.
<pre>\syncanchor{one}{3}{1}C \crlf \syncanchor{one}{1}{2}AA \syncanchor{one}{3}{2}C \crlf \syncanchor{one}{1}{3}AAA \syncanchor{one}{2}{3}BB \syncanchor{one}{2}{3}BB \syncanchor{one}{3}C } Here a cell is missing which is why we are more explicit with the coord A BBB C AA C</pre>	linates.
<pre>\syncanchor{one}{1}{2}AA \syncanchor{one}{3}{2}C \crlf \syncanchor{one}{1}{3}AAA \syncanchor{one}{2}{3}BB \syncanchor{one}{3}{3}C } Here a cell is missing which is why we are more explicit with the coord A BBB C AA C</pre>	linates.
<pre>\syncanchor{one}{3}{2}C \crlf \syncanchor{one}{1}{3}AAA \syncanchor{one}{2}{3}BB \syncanchor{one}{3}{3}C } Here a cell is missing which is why we are more explicit with the coord A BBB C AA C</pre>	linates.
<pre>\syncanchor{one}{1}{3}AAA \syncanchor{one}{2}{3}BB \syncanchor{one}{3}{3}C } Here a cell is missing which is why we are more explicit with the coord A BBB C AA C</pre>	linates.
<pre>\syncanchor{one}{2}{3}BB \syncanchor{one}{3}C } Here a cell is missing which is why we are more explicit with the coord A BBB C AA C</pre>	linates.
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} Here a cell is missing which is why we are more explicit with the coord A BBB C AA C	linates.
Here a cell is missing which is why we are more explicit with the coord A BBB C AA C	linates.
Here a cell is missing which is why we are more explicit with the coord A BBB C AA C	linates.
A BBB C AA C	
AA C	
AAABB C	
Nitheur this mechanism is nor really meant for tables you can infl	nor co th
Although this mechanism is not really meant for tables you can mill	uence in
lingnment a bit.	
\framed [synchronize=yes align=normal] {%	
\alignanchorfono\{1\{1\{1\}}	
$\langle ang nanchor \langle one \rangle \langle 1 \rangle \langle 1 \rangle \langle 1 \rangle \langle n \rangle \rangle$	
$\langle ang nanchor \langle one \rangle \langle 1 \rangle \langle 2 \rangle \langle n \rangle AA$	
\alignanchor fono\{1\fl\crif	
\syncalicitor (one)(1)(4)(cni \signameher(one)()(1)(1)(right)D	
\alignanchorfonalfalfalfalabPP	
\alignanchorfonalfalfalfalPPP	
syncanchor (one)(2)(4)	
{	
Because this is rather verbose it probably makes most sense to use the	se helper
n macros which is why we have no high level interface (vet).	I
A AA AAA	
3 BB BBB	
Of course a valid question is, how does that work with MetaPost graphi	ics so let
rive an example of using anchors there. We start with defining a gen	w useabl
raphics:	
\startuseMPgraphic{whatever-1}	
fill OverlavBox withcolor "lightgray" ;	
drawdot anchorxy("one", 0, 1)	
withpen pencircle scaled 1mm	
withcolor "red" :	
drawdot anchorxy("one" 0 2)	
withnen pencircle scaled 1mm	

	withcolor "red" ;	_	1
	drawdot anchorxy("two", 0, 1)	-	2
	withpen pencircle scaled 1mm	-	3
	withcolor "red" ;	_	4
	drawdot anchorxy("two", 0, 2)	1	5
	withpen pencircle scaled 1mm		6
	withcolor "red" ;		7
	drawdot anchorxy("three", 0, 1)		8
	withpen pencircle scaled 1mm		9
	withcolor "red" ;		10
	setbounds currentpicture to OverlayBox ;		11
	\stopuseMPgraphic		12
		-	13
	\startuseMPgraphic{whatever-2}	_:	14
	pair a ; a := anchorxy("one", 0, 1) ;		15
	pair b; b := anchorxy("one", 0, 2);		16
	drawarrow	-	17
	anchorxy("one", 0, 1) { right }		18
	anchorxy("one", 0, 2)		19
	withcolor "blue" withtransparency (1,.75);		20
	drawarrow		21
	anchorxy("two", 0, 1) { down }		22
	anchorxy("two", 0, 2)		23
	withcolor "blue" withtransparency (1,.75) ;	:	24
	drawarrow		25
	anchorxy("two", 0, 1) { dir 30 }		26
	anchorxy("three", 0, 1)		27
	withcolor "blue" withtransparency (1,.75) ;		28
	setbounds currentpicture to OverlayBox ;		29
	\stopuseMPgraphic		30
			31
	We also define two overlays using them:		32
			33
	\defineoverlay[whatever-1][\useMPgraphic{whatever-1}]		34
	\defineoverlay[whatever-2][\useMPgraphic{whatever-2}]		35
			36
	Because we want the arrow on top, we explicitly flush the foreground (text))	37
	between these graphics:		38
			39
	\framed	_	40
	[synchronize=yes,		41
	align=normal,	_	42
	offset=10pt,		43
	frame=off,		44
	background={whatever-1,foreground,whatever-2}]		45
_	{%		46
	\markanchor{two}{0}{1}{\red\bf foo}%	4	47
	\markanchor{one}{0}{1} bar rab oof\crlf	_	48
		4	

<pre>ioo oaf rab Ool(crif oof rab bar foo/crif oof rab \markanchor{two}{0}{2}{red\bf bar}% \markanchor{ne}{0}{2}foo% \markanchor{three}{0}{1}% } This definition is a bit unreadable because it has to fit on the page, but here is what we get: foo bar rab oof oof rab bar foo oof rab bar foo oof rab bar foo oof rab bar foo oof rab.ban foo All the above trickery can be combined: \framed [synchronize=yes, align=norma], offset=10pt, frame=off, background={whatever-1,foreground,whatever-2}] {% one one one \syncanchor{a}{1}{1}{1}two two two \syncanchor{a}{2}{2}{1}three three\par one \syncanchor{a}{1}{2}{2}two \syncanchor{a}{1}{2}{2}{1}three\par one \syncanchor{a}{1}{1}{3}two \syncanchor{a}{2}{2}{1}three\par one \syncanchor{a}{1}{1}{2}two \markanchor{two}{0}{1}{1}tred\bf foo}% \markanchor{two}{0}{2}{1}ther three\par of rab bar foo\crif oof rab \syncanchor{a}{1}{2}{t}three\par one \syncanchor{a}{2}{t}three\par one osyncanchor{a}{1}{2}{t}three\par one osyncanchor{a}{1}{2}{t}three\par one osyncanchor{a}{1}{2}{t}three\par one osyncanchor{a}{1}{2}{t}three\par one osyncanchor{a}{1}{2}{t}three\par one osyncanchor{a}{2}{t}three\par one osyncanchor{a}{1}{t}t}three\par one osyncanchor{a}{t}{t}t three\par one osyncanchor{a}{t}{t}t three\par one osyncanchor{a}{t}{t}t three\par one osyncanchor{a}{t}t three\par one osyncanchor{a}{t}t three\par one osyncanchor{a}{t}t three\par one osyncanchor{a}{t}t three\p</pre>	£ 1		
ool rab Dar IGO\CTI oof rab Vmarkanchor{two}{0}{2}{red\bf bar}% \markanchor{three}{0}{1}% } This definition is a bit unreadable because it has to fit on the page, but here is what we get: foo Dar rab oof oo bar rab oof oof rab bar foo oof rab bar foo offset=10pt, frame=off, background={whatever-1,foreground,whatever-2}] {% one one one \syncanchor{a}{1}{1}three three\par one \syncanchor{a}{1}{1}three three\par one \syncanchor{a}{1}{1}three three\par one \syncanchor{a}{1}{1}three three\par one \syncanchor{a}{2}{3}three\par (\blank \markanchor{two}{0}{1}bar rab oof\cTlf oof rab bar foo\% \markanchor{two}{0}{1}bar rab oof\cTlf oof rab bar foo\CTlf oof rab bar foo\CTlf one one \syncanchor{a}{1}{1}{0}{1}{0}{0}{1}{0}{0}{1}{0}{0}{1}{0}{1}{0}{0}{1}{0}{0}{1}{0}{1}{0}{1}{0}{1}{0}{1}{0}{1}{0}{1}{0}{1}{1}{0}{1}{0}{1}{0}{1}{1}{0}{1}{0}{1}{1}{0}{1}{1}{0}{1}{1}{0}{1}{1}{0}{1}{1}{1}{1}{0}{1}{1}{0}{1}{1}{1}{1}{1}{1}{1}{0}{1}{1}{1}{1}{1}{1}{1}{1}{1}{1}{1}{1}{1}	too bar r		
oof rab \markanchor{two}{0}{2} foo% \markanchor{one}{0}{2} foo% \markanchor{three}{0}{1}% } This definition is a bit unreadable because it has to fit on the page, but here is what we get: foo bar rab oof foo bar rab oof oof rab bat foo oof rab bat foo oof rab.bat foo oof rab.bat foo oof rab.bat foo framed [synchronize=yes, align=normal, offset=10pt, frame=off, background={whatever-1,foreground,whatever-2}] {% one one one \syncanchor{a}{1}{1}{1}thwo two two \syncanchor{a}{2}{2}{1}three\par one \syncanchor{a}{1}{2}{2}three\par one \syncanchor{a}{1}{3}two \syncanchor{a}{1}{2}{1}three\par one \syncanchor{a}{1}{2}{1}three\par one \syncanchor{a}{1}{2}{2}{three}par one \syncanchor{a}{1}{2}{2}{three}par one \syncanchor{a}{1}{2}{2}{three}par one \syncanchor{a}{1}{2}{2}{three}par one \syncanchor{a}{1}{2}{2}{three}par one \syncanchor{a}{1}{2}{2}{three}par one \syncanchor{a}{1}{2}{2}{three}par one \syncanchor{a}{1}{2}{2}{three}par \blank \markanchor{two}{0}{1}{ther trobo}{\syncanchor{a}{2}{2}{red\bf bar}{\syncanchor{a}{a}{1}{2}{5}three \markanchor{two}{0}{1}{3}{three}par one one \syncanchor{a}{1}{2}{three}par one one \syncanchor{a}{1}{2}{three}par one one \syncanchor{a}{1}{2}{three}par one one \syncanchor{a}{2}{1}{three}par one one \syncanchor{a}{2}{1}{three}par one one \syncanchor{a}{1}{2}{three}par one one \syncanchor{a}{1}{2}{three}par one one \syncanchor{a}{1}{2}{three}par one one \syncanchor{a}{1}{2}{three}par one one \syncanchor{a}{1}{2}{three}par one one \syncanchor{a}{2}{2}{three}par one one \syncanchor{a}{1}{2}{three}par one one \syncanchor{a}{1}{2}{three}par one one \syncanchor{a}{1}{2}{three}par one one \syncanchor{a}{1}{2}{three}par one one \syncanchor{a}{1}{2}{three}par one one \syncanchor{a}{2}{2}{three}par one one \syncanchor{a}{2}{2}{three}par one one \syncanchor{a}{2}{1}{three}par one one \syncanchor{a}{1}{1}{three}par one one \syncanchor{a}{1}{1}{three}par one one \syncanchor{a}{1}{1}{three}par one one \syncanchor{a}{1}{1}{three}par one one \sync	oof rab b	par too\crlt	
<pre>\markanchor{one}{0}{2} foo% \markanchor{three}{0}{1}% } This definition is a bit unreadable because it has to fit on the page, but here is what we get: foo bar rab oof foo bar rab oof oof rab bar foo oof rab bar foo offset=10pt, frame=off, background={whatever-1,foreground,whatever-2}] {% one one one \syncanchor{a}{1}{1}{1}two two two</pre>	oof rab \	<pre>,markanchor{two}{0}{2}{\red\bf bar}%</pre>	
<pre>\markanchor{three}{0}{1}% } This definition is a bit unreadable because it has to fit on the page, but here is what we get: foo bar rab oof and rab bar foo oof rab.bai foo and and and and and and and and and and</pre>	\markan	chor{one}{0}{2} foo%	
<pre>} This definition is a bit unreadable because it has to fit on the page, but here is vhat we get: foo bar rab oof foo fab markanchor(two){0}{2}{rod foo} foo frab bar foo foo fab markanchor(two){0}{2}foo% foo fab markanchor(two){0}{2}foo% foo fab markanchor(a}{1}{1}{s}two foo fab foo foo fab foo core f</pre>	\markan	chor{three}{0}{1}%	
This definition is a bit unreadable because it has to fit on the page, but here is what we get: for bar rab oof for bar rab oof oof rab bar foo oof rab bar foo (syncanchor{a}{1}{1}{1} wo two two	}		
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foo bar rab oof foo bar rab oof oof rab bar foo offset=10pt, frame=off, background={whatever-1,foreground,whatever-2}] {% one one one \syncanchor{a}{1}{1}{1}three three\par one (syncanchor{a}{2}{2}three\par one \syncanchor{a}{2}{3}three\par one \syncanchor{a}{2}{3}three\par \blank \markanchor{two}{0}{1}{1}threa bf oo}% \markanchor{two}{0}{1}{2}{redbf bar}% \markanchor{one}{0}{2}{foo% \markanchor{a}{2}{4}three\par \one one \syncanchor{a}{1}{1}{5}two two \syncanchor{a}{1}{2}{2}tbree \syncanchor{a}{1}{2}{2}{tredbf bar}% \markanchor{one}{0}{1}% \markanchor{a}{1}{2}{2}{4}three \markanchor{a}{1}{2}{2}{broe} \markanchor{a}{1}{2}{2}{1}{1}{1}{3}two \syncanchor{a}{1}{2}{2}{5}two two \syncanchor{a}{2}{2}{1}{2}{1}{1}{1}{3}two two \markanchor{a}{1}{1}{2}{5}two two			
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too bit hit foo oof rab bar foo All the above trickery can be combined: \framed [synchronize=yes, align=normal, offset=10pt, frame=off, background={whatever-1,foreground,whatever-2}] {% one one one \syncanchor{a}{1}{1}{1}two two two \syncanchor{a}{1}{2}{2}three three \par one \syncanchor{a}{1}{2}{2}three \par one \syncanchor{a}{1}{2}{3}three \par \blank \markanchor{two}{0}{1}{1}{1}\tred\bf foo}% \markanchor{one}{0}{1}bar rab oof\crlf oof rab bar foo\crlf oof rab oof\crlf oof rab bar foo\crlf oof rab oof\crlf oof rab oof\crlf oof rab \markanchor{two}{0}{0}{2}\red\bf bar}% \markanchor{one}{0}{1}% \markanchor{three}{0}{1}% \markanchor{ta}{2}{2}{5}three three% \markanchor{a}{2}{4}three \par \syncanchor{a}{2}{5}three three% \markanchor{three}{0}{1}{5}two two \syncanchor{a}{2}{5}three three% \markanchor{three}{0}{1}{7} one one \syncanchor{a}{1}{2}{5}two two \syncanchor{a}{1}{2}{5}two two <t< td=""><td>foo har rah o</td><td></td><td></td></t<>	foo har rah o		
Ood rab_bar foo All the above trickery can be combined: \framed [synchronize=yes, align=normal, offset=10pt, frame=off, background={whatever-1,foreground,whatever-2}] {% one one one \syncanchor{a}{1}{1}{1}two two two \syncanchor{a}{2}{1}three three\par one \syncanchor{a}{1}{2}{2}three\par one \syncanchor{a}{1}{3}two \syncanchor{a}{1}{2}{3}three\par one \syncanchor{a}{1}{3}two \syncanchor{a}{1}{2}{3}three\par \blank \markanchor{two}{0}{1}{1}{red\bf foo}% \markanchor{one}{0}{2}foo% \markanchor{one}{0}{2}foo% \markanchor{two}{0}{2}foo% \markanchor{a}{2}{4}three\par \markanchor{a}{2}{4}three\par \syncanchor{a}{2}{4}three\par	oof rab har fo		
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All the above trickery can be combined:			
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\framed [synchronize=yes, align=normal, offset=10pt, frame=off, background={whatever-1,foreground,whatever-2}] {% one one one \syncanchor{a}{1}{1}{1}two two two		Indiary carrier companies.	
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<pre>align=normal, offset=10pt, frame=off, background={whatever-1,foreground,whatever-2}] {% one one one \syncanchor{a}{1}{1}{two two two</pre>	[synchroni		
offset=10pt, frame=off, background={whatever-1,foreground,whatever-2}] {% one one one \syncanchor{a}{1}{1}two two two	align=noi	rmal	
<pre>onset=ropt, frame=off, background={whatever-1,foreground,whatever-2}] {% one one one \syncanchor{a}{1}{1}three three\par one \syncanchor{a}{2}{2}three\par one \syncanchor{a}{1}{2}two \syncanchor{a}{2}{2}three\par one \syncanchor{a}{1}{3}two \syncanchor{a}{1}{3}two \syncanchor{a}{1}{3}three\par \blank \markanchor{two}{0}{1}three\par \blank \markanchor{one}{0}{1}three\par of rab bar foo\crlf oof rab bar foo\crlf oof rab har foo\crlf oof rab markanchor{two}{0}{2}{o% \markanchor{three}{0}{2} foo% \markanchor{three}{0}{1}% \blank one one \syncanchor{a}{1}{4}two two \syncanchor{a}{1}{5}two two \syncanchor{a}{2}{5}three three% \markanchor{three}{0}{1}% }</pre>	offsot - 10	mt	
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<pre></pre>	JOV	nd—1 whatever-1, loreground, whatever-25]	
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This again not so readable example gives:	}		
This again not so readable example gives:			
	This again not	so readable example gives:	

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one	two	three	
foo bar rab	oof		
foo bar rab	oof		
oof rab bar	foo		
oof rab bar	foo		
_			
one one	two two	three	
one one	two two	three three	
The namespa	ice suggests t	hat we can ha	ve more than one alignment set:
\framed[s	ynchronize=	yes,align=norr	nal]{%
one on	e \sync{a}{1]}two \sync	:{a}{2}three\par
one on	e \sync{a}{1	}two two \svi	nc{a}{2}three\par
\blank		5	
tst tst	$\sum_{v \in \{b\}} \{1\}$	tst b){2}tst\par
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\ blank		Cot tot toynctr	
(Dialik	$\lambda_{aux} = \int_{-}^{-} \int_{-$		nl{0l+hree
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	- +	· · · · · · · · · · · · · · · · · · ·	
i nis again no	ot so readabl	le example giv	es the following. Watch now we mix the
lines:			
ana ana tura	three		
one one two	three		
one one two	two three		
tst tst tst	tst		
tst tst tst	tst		
one two	three		
Of course we	also want to	see how this	can be used in math. Take these lines:
\$a = b +	c \$\par		
\$b = c +	d \$\par		
c = e +	f \$\par		
,	, (<u>1</u> ,		
This renders	as follows:		
THE TUNCTS	ub 10110775.		
$a = b \perp a$			
a = 0 + c b = c + d			
b = c + a			
c = e + j			
lt vou watch	carefully, yo	ou will notice	that the identifiers and operators don't

align vertically. The spacing related to the configured intermathobject s parameters:	pacing
a - b + c	
b = c + d	
$c_{\text{refer}} = c_{\text{reference}} + J_{\text{reference}}$	
But here also the italic correction can kick in. And of course the widths	of the
glyphs differ.	
a = b + c	
c = e + f	
In the next exemples we will align the energy	
In the next examples we will angli the operators.	
\startsynchronizing	
$a \ (0, 0) $	
$b \ (0) = c \ (0) + d $	
$c \sum_{0} $	
\stopsynchronizing	
I'his verbose version gives:	
a = b + c	
b = c + d	
c = e + f	
We can use less code:	
\startsvnchronizing	
$a \ svnc{one}{1} = b \ svnc{one}{2} + c\ svnc{one}{2}$	
$\frac{1}{2}$ (Synctone) (2) = c (Synctone) (2) + d(par)	
$s_{c} = e synctone {1} + f $	
\stopsynchronizing	
(brop by nomening	
and get:	
a - b + c	
b = c + d	
b = c + a	
c = e + j	
But it's still not okay, because math spacing is kind of special:	
\startsynchronizing	
$(source)$ (source) $(1) = b$ (mathematical) $(2) \pm c^{0}$	
$\varphi_{\alpha} = \varphi_{\alpha} = \varphi_{\alpha$	
ϕ \mathcal{b} = c \mathcal	
<pre> \morasyncils= e \matnsynci2s+ i\$\par </pre>	

You can best run these examples in a	test file and watch the nuances full screen
= b + c	
= c + d	
= e + f	
/ith traced math kerning:	
-h + c	
rel = control rate have	
$\frac{1}{10} = e_1 + f_1$	
trel peleriprinin put	
/ith traced math alignment correction	n:
= e + f	

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