Provisional notes for Tplan version 29.1

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Content

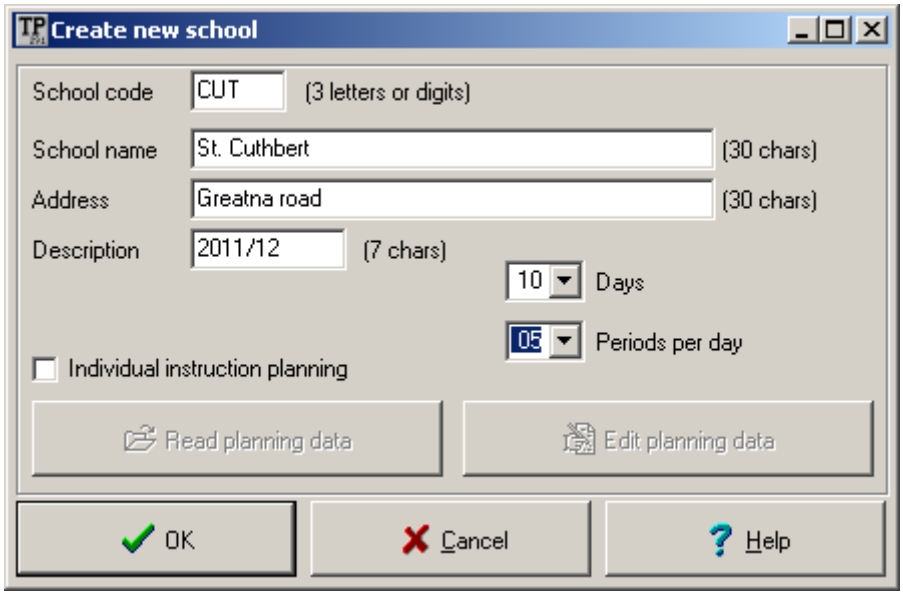
Introduction

We have decided to release version 29.1 forthcoming season, summer 2011. This requires some revisions of the current user manual for version 28. Due to time limits (Mid-April -11 now) this cannot be done in a satisfactory manner. What follows is a set of supplementary notes to current user manual, and we refer to parts of the manual where we have made modifications. Of course what we write here overrules older documentation. Mainly these notes are intended for users with some experience, but we also make a few comments to make the initial start of using Tplan simpler for the beginner. In quite a number of places we have tried to simplify the use both for beginners and more experienced users. By that we mean we eliminate facilities which you normally don't need depending on how you judge your own experience level. (See later). Almost no one except System support should classify themselves as Advanced since some options here may have undesirable consequences if you are the least uncertain about what you are doing.

Closing note (27/05-11): I don't think that the content in this paper is too bad and this is badly needed. I am not too proud of the layout of this document, but considering this has been produced in 30 days I am not ashamed of it either.

Start of Tplan

There have been two main methods for the opening dialog in Tplan. Now we recommend all to use what we call New opening dialog where you save all your data in just one *.tpd – file. Assume you are going to enter new data from scratch. You open a blank data set and the very next thing you do is to click on the third button in your main button bar: Create a New school. The following dialog appears:



Fill in this obligatory info and in particular try to define a school code which might be unique for your own school. I represent system support receiving data sets from quite a number of different schools, and I have to inspect the individual registers in your data. When all schools have the same default code (HMX), I get problems in keeping different school's data apart. Please, save me from that quite unnecessary problem.

By clicking Ok in the above dialog you enter the grid for obligatory school parameters filled with default values. Modify these to suit your own school data and you are ready for data entry as

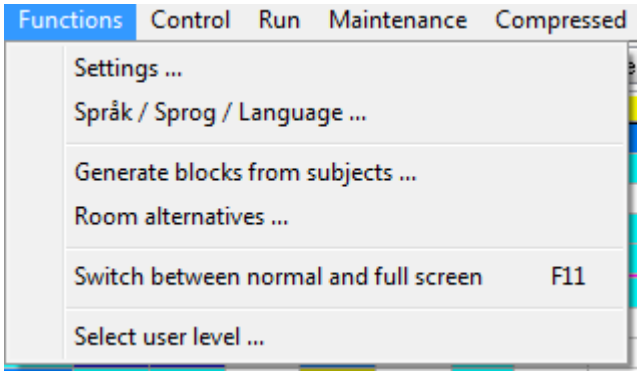
explained in the current user manual. These rules will not be changed here except from some very special timetabling mechanisms.

SELECT LANGUAGE

Before starting data entry you should do a little more initial work.

Select tab sheet Functions and you get this dialog:

Select the language you prefer.

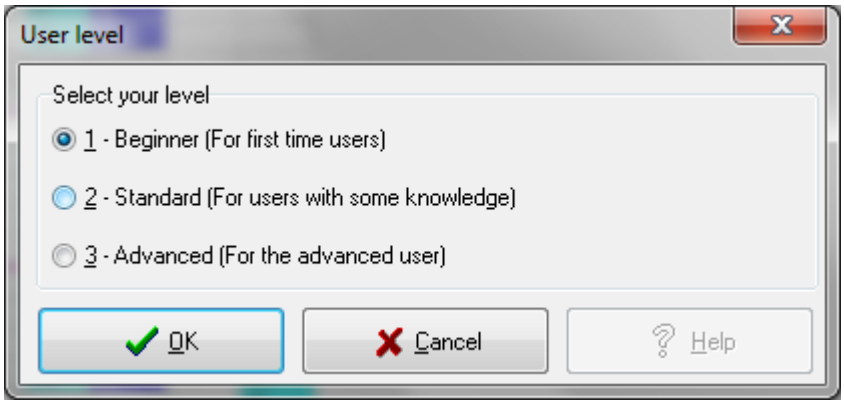


Go to Settings > Errors and select Complete. That produces considerable information which you normally need in the start, but you should reduce all this info when you finally have a complete and formal correct data set.

SELECT USER LEVEL

The following dialog appears:

Select either 1 or 2 here while 3 almost assume you have discussed that with me.



The reason for the choice above is to eliminate from the beginner some facilities which only might seem confusing in the initial stages.

In particular you will notice the difference of your choice in the set of run options being available. (Advanced contains a set of options of a very special nature, and I will not document that for the moment.)

Importing data from version 28.6 to version 29.1

If you have *.tpd –file from 28.6 all your basic data entry are automatically compatible with version 29.1 However the end result i.e. final table from 28.6 is not compatible with 29.1. The main reason for that is that we have completely reorganised the internal data structure. I didn't think this would matter much, but there will surely be someone who wants last year's table in version 29.1. I shall give a helping hand provided you have some data experience:

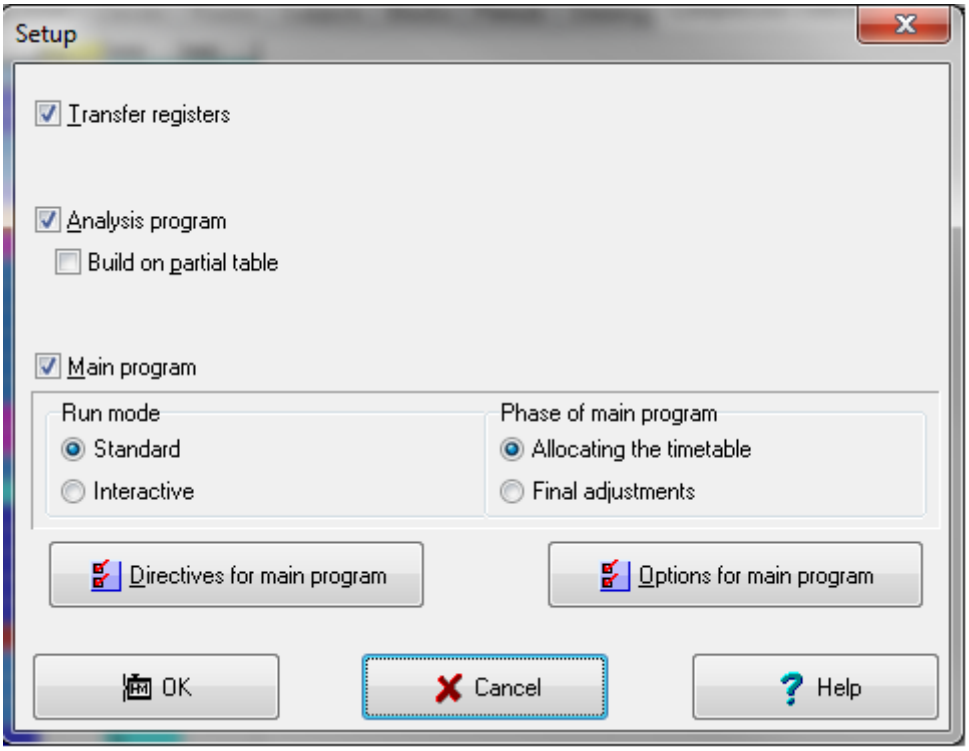
- Unzip the desired *.tpd- file in the same folder as this file.
- You will find here a file JUMOD.nnn (nnn= school key) in this folder. Enter the folder in DOS-environment. Do this Copy-command:
- COPY JUMOD.nnn JUMOD28.nnn
- Start Tplan ver 29.1. Go to Functions>Settings>Save and Check: Use classic school opening dialog.

- Go File Menu and click Open. You are transferred to the Old opening dialog. Click Add here and enter your school data.
- Run: TRANSFER + ANALYSIS but don't build on partial table. Now you have your basic situation in 28.6 transferred to 29.1.
- Go to Run options and check Old Iteration + Import ver. 28
- Run ANALYSIS + Build on partial table. Now the file Jumod28.nnn you made are transferred to ver. 29.1
- Inspect Compressed and that should be your table from last year. Uncheck the options mentioned above.
- Save your data as a zip-file. Restore to normal run conditions and open your saved zip- file
- Save that as a *.tpd file and now you have the complete table from last year in version 29.

(Perhaps Lasse could make that simple process automatic?)

The run menu (Initial part of chapter 5 in old manual)

The new simplified run menu looks like this:



We have 3 distinct phases in run menu:

Transfer registers.

This part is similar to version 28 with a few exceptions:

The checking of formal (grammatical) errors is now done by Wintp and not Hmtp. This check is either done by using the Inspect button or by a transfer run. Any formal error will stop a further run and you are transferred to a survey showing the errors and by clicking on an error, you are easily led to where the error occurred. There is just one way of forcing a transfer regardless of grammatical errors i.e. a specific run option for that. The inexperienced user should not use that possibility but concentrate on finding the errors to simplify what may happen in continued runs. However, there

are few cases where the grammatical errors don't tell what really goes wrong, and it may be necessary to force a transfer to get a better survey.

The output file Lisy is split in two parts: Lisy and Lisys. Initially you will be interested in both files, but as you do quite a number of new transfers it is perhaps sufficient with the more compressed and vital info in file Lisy.

Analysis Program

The additional dialog here has been removed and the parameters here are now defined by a run option. We only need to specify if we a creating a table from scratch or continuing from a partial table already created.

Main Program

Here there is a set of additional parameters which must be specified:

Run mode: (Standard or Interactive)

In almost all cases you should use Standard mode. Earlier I had high hopes for the Interactive mode where timetabling is stopped temporarily at once when you get a kickout, and the intention is to adjust this immediately. That might often lead to dubious manual guesswork, but in some cases I have found the technique useful, say the last part of a large timetable where only pure class activities remained to be allocated.

PHASES OF THE MAIN PROGRAM

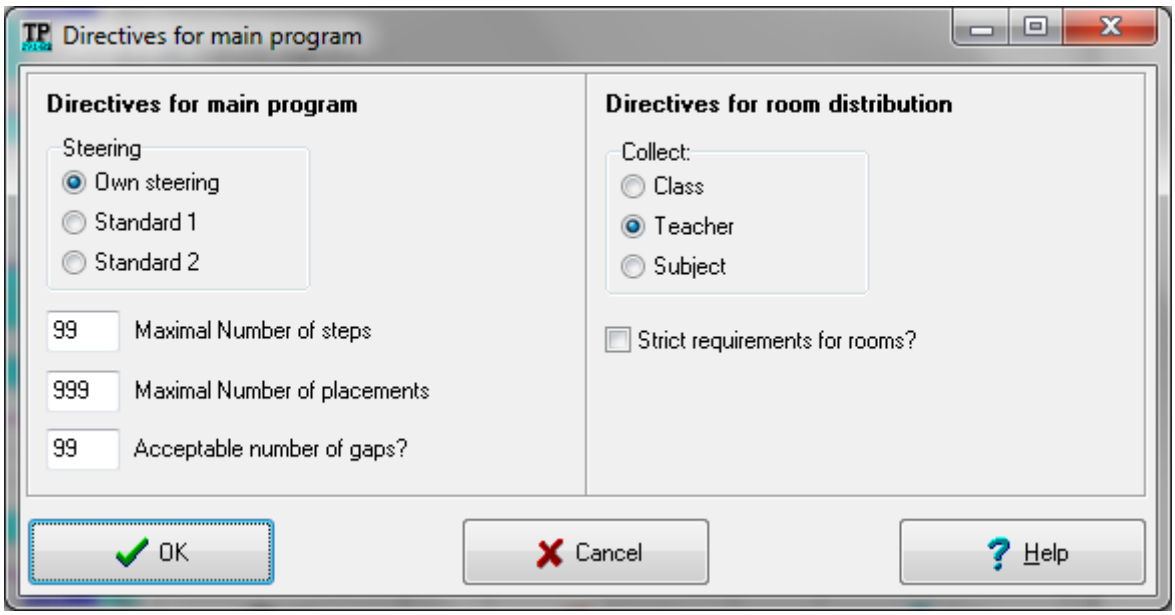
This is an important choice which you always must consider, and this is linked with a couple of important run options. The Allocation phase uses options: Indirect room allocation + New room allocation. The Adjustment phase substitutes this with Absolute room allocation. The first set of options is definitely the best options while you gradually build a complete timetable and possibly builds on a previous partial table. Sooner or later you reach a stage where all activities are assigned in time, but there are still problems with some teacher/room changes. Now you must definitely switch to Adjustment phase to keep firmly locked all the teacher/room changes you are going to make, and you in addition have to return to a new transfer/analysis/main run for continued runs. However, you risk that this continued run will not be as optimal as if you were in Allocation phase. On the other hand a return to this phase means that you lose all the efforts with room adjustments. **So you have to make a choice!!**

To sum this up:

Try to make a complete table in TIME using the Allocation phase and postpone as long as possible teacher/room- changes. When you eventually solve all kickouts switch to Adjustment phase, and you are stuck with that for the remainder of the process; in particular if you do many room changes. (It could happen that these are few, and you could produce a new table in the better Allocation phase starting from scratch with rooms.)

Directives for main program

This leads to the following dialog:



This is a considerable simplification of earlier dialogs for main program and room allocation. We only use the most important parameters here and less frequent parameters may be defined by some additional option. Definition of parameters in above dialog:

Steering

Normally you use your own steering as explained in user manual. Alternatively you might initially use a standard steering. (I might modify these in the future.)

Maximal Number of steps

This is the standard way of creating a partial timetable from a set of directives as explained in user manual.

Maximal Number of placements

This is an alternative and less frequent way of only making only a partial timetable i.e. the main run is stopped after a fixed number of assignments. This is intended for the case where a specific steering directive refers to a large number of activities and you don't want to assign all these in the same step. (This parameter might also be useful for system support.)

Acceptable number of gaps

For a medium complex timetable you will normally want to create tight teacher tables and you normally select a value in the region 2- 5. For other school structures you can't afford to require or are not interested in requiring tight teacher tables. In that case use the value 99. If you use a value of 0 or 1, you trigger some very special mechanism which gives a considerable reduction in teacher gaps but which may have undesirable side effects like many more kickouts. In general I don't recommend the use of these facilities.

Principles for collection of rooms

For traditional "class rooms" you want classes, teacher or subjects in the same room as much as possible. (That varies much from school to school.) This last principle means that you keep same subject in same room at the expense of having both classes and teachers to move more around than

possibly needed (There are also some options for allocating rooms like: Maximal packing where you will have fewer lacking rooms but which increases more movements of classes and teachers.)

Strict requirements for rooms

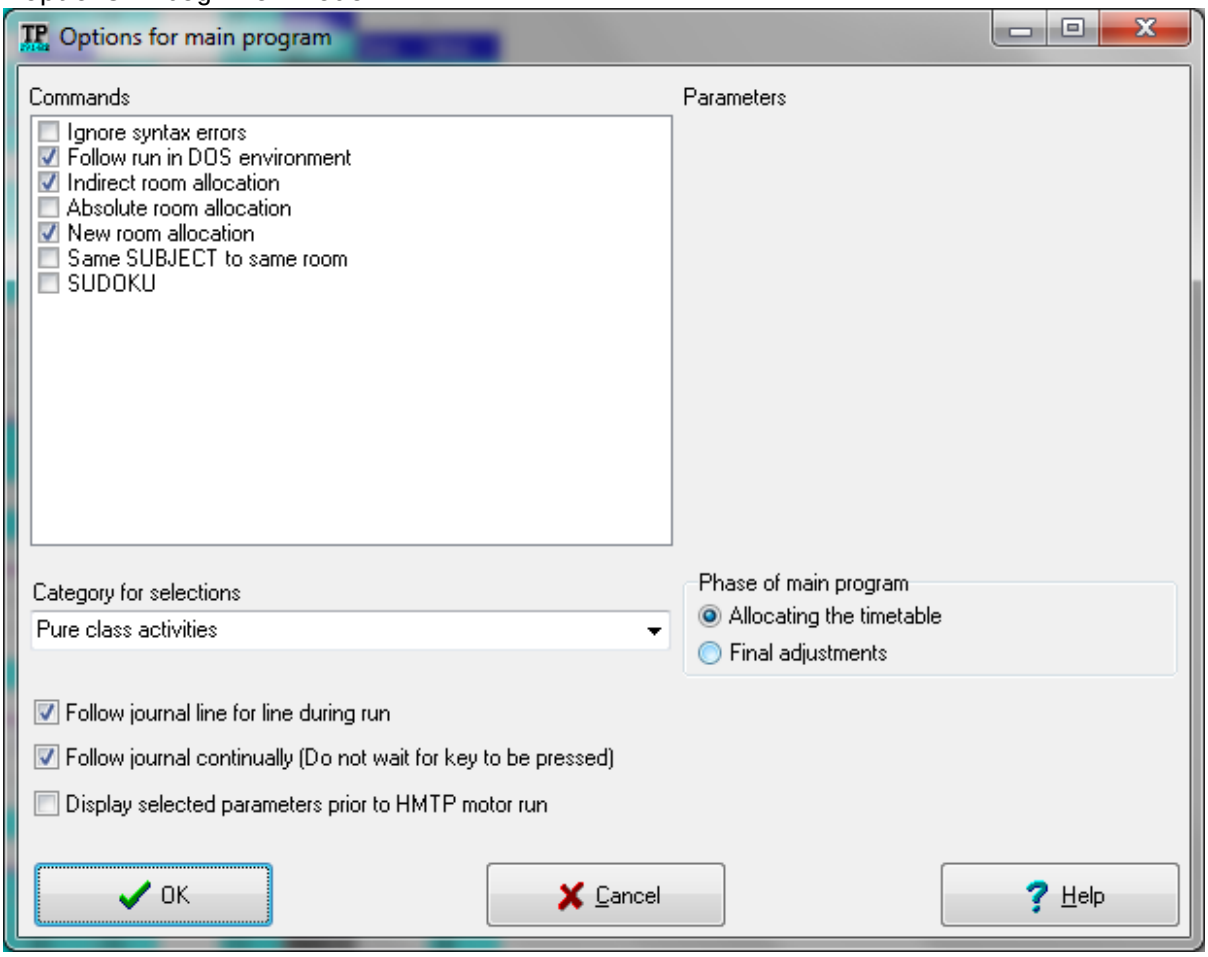
Normally I recommend you to check this parameter. If it turns out that get too many lacking rooms, rerun room allocation and uncheck this parameter and see how much the situation improves.

RUN OPTIONS

This is now a separate choice in Run dialog (and there is also a separate button for that in Main Bar)

The content here depends on whether yourself say you are beginner or require standard use.

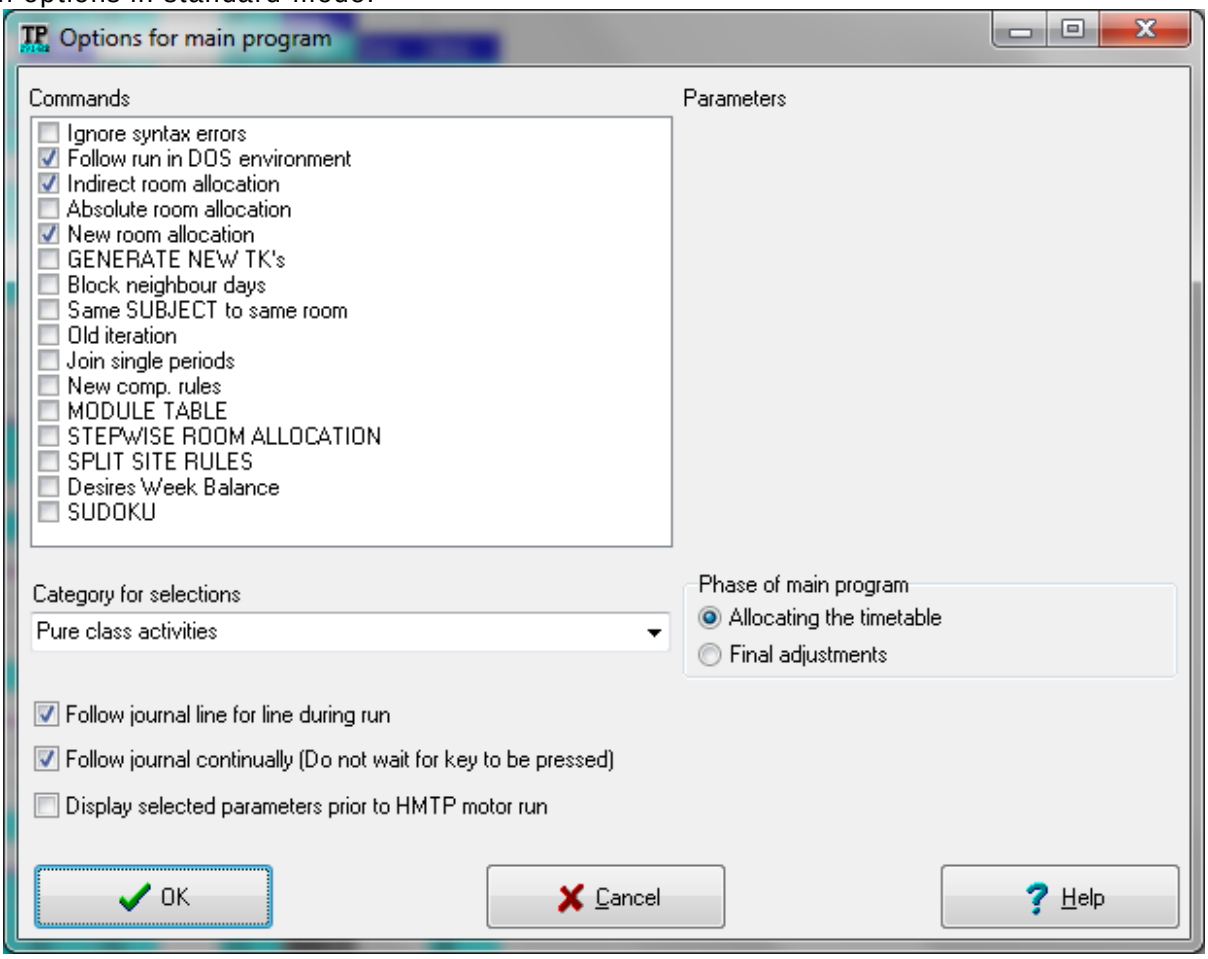
Run options in beginner mode



Run option	Command	Explanation	Comment
Ignore syntax errors	FORCE	Forces a Transfer Run even if there are formal errors	As a beginner you should normally concentrate on correcting the formal errors to avoid later confusion. However there are cases where you need the option to get sensible info about what is going on.
Follow run in DOS environment	ch	While running a DOS window will open showing info about the	Definitely, I use this option almost obligatory. I can read much more from

		progress of the current run.	that than the average user. But ALL can see that something happens (or possibly not happens) For that reason alone I recommend all to use this option. (Our current Progress Bar is rather pointless and does not tell much)
Indirect room allocation	RSKIP	Used as a link between analysis program and main program. Current room table is only used as a logical matrix securing that all room requirements in various periods are respected while no direct allocation of room takes place. This secures the main program maximal freedom for continued timetabling while older manual adjustments of rooms will be lost	The recommended option to use when creating class/teacher tables and getting rid of the kickout list.
Absolute room allocation	RKEEP	This is the opposite of indirect room allocation. All manual teacher/room changes are kept in the continued timetabling process. This might easily remove some flexibility in the continued timetabling	Obligatory option in case you insist on preserving all manual teacher/room changes you have done till now
New room allocation	RNEW	Creates from scratch a new room table	Often a useful option to use once more when you have solved your kickout list and are ready for the final room adjustments.
Same SUBJECT to same room	FAGPRI		An unneeded option now since you can require the same in directives to main program.
Sudoku	SUDOKU	Needed option in to play with the Sudoku puzzle.	

Run options in standard mode.



In standard mode we mention these additional run options:

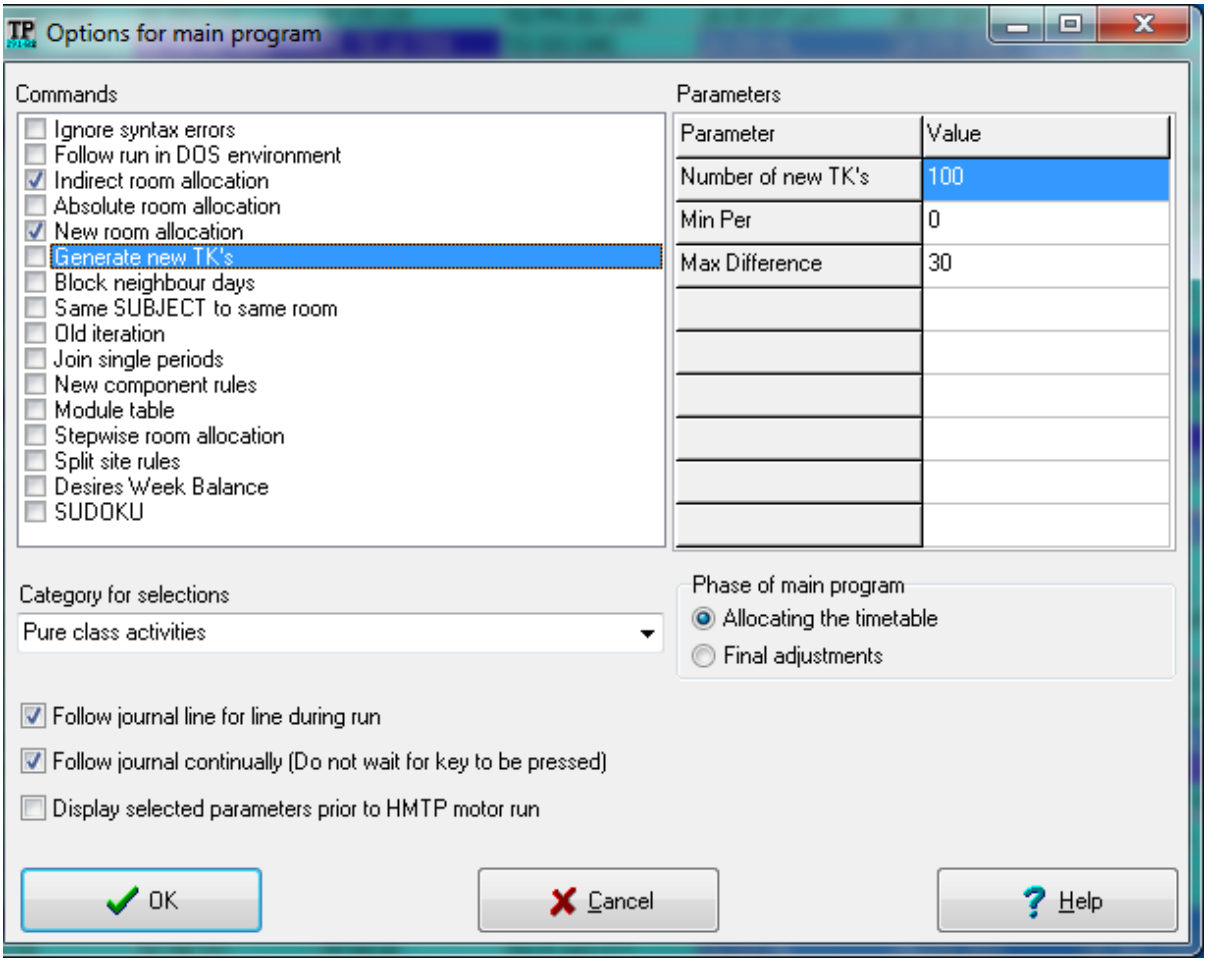
Run Option	Command	Explanation	Comment
GENERATE NEW TKs	**TKPAR**	Creates additional TK's just as before in the Analysis dialog. This option has additional parameters and an example is shown below.	This is an important option, but we recommend beginners only to use default values.
Block neighbour days	**NABO**	The assignment of an activity on a day will block the activity on neighbour days	A very strict requirement which must be used carefully: in particular if you have a 5-day school week.
Old iteration	**ITOLD**	The link between the analysis and main program is made by means of internal logical matrixes and the table you see onscreen is ignored.	The old way of linking between various parts of Tplan. Might also be very useful these days in case you get lost in the table onscreen.
Join single periods	**DSPAN**	Tries to assign single periods in contiguous positions	This is useful in a typical case where the spanning rules are 2-2-2-2 and the table consists

			of mainly multiple periods and few singles. In such a case the singles make up some “implicit” sequential which is important to consider. (If many singles don’t use this facility)
New comp. rules	**COMP**	These notes will show an alternative way of specifying components. To use that, this option is required.	Till further notice we accept both old and new way of specifying components
MODULE TABLE	**SVMOD**	Tries to assign activities for classes in contiguous periods to reduce the possibility of potential gaps. Also considers the possibilities for assigning staggered lunch breaks	If the teaching unit is small for instance 20 min., we get a rather particular timetable problem. The main bulk of the teaching will be large and varying multiple periods. Such tables will as a necessity contain some gaps in class tables, but we want to reduce these as much as possible. This option is VITAL for such timetables.
STEPWISE ROOM ALLOCATION	**TWOSTEP**	Room allocation is done in two steps. In the first stage we only allocate rooms for multiples and the second stage is allocation of rooms to remaining singles. The idea is to fulfil more room requirements failing due to the period breakdown.	This option tries to strengthen what we call Strict Requirements in Run menu.
SPLIT SITE RULES	**SPLIT4**	This option covers the following split site situation: There is a geographical distance between 2 schools which shares teachers. Shift from A to B can only take place at a specific time of the day, and teachers shifting can’t teach in contiguous periods in different schools when the shift takes place.	This option has parameters for defining when the shift shall take place and specification of what is school A and B. Other split site conditions may be defined and will also require a special run option.
Desires Week Balance	**WBAL**	For 10 day week only. Originally we required that 10- day table had an even load of all subjects in the two weeks. That was initially an almost absolute requirement.	10- Days tables relax in any case a complex timetable. By using this option in addition you relax the complexities further. Could be recommended if you

		By using this option we state that even spread is a highly desirable requirement	have a really complex timetable

This is the set of run options I wish to mention for the moment. There are quite a number of additional run options. Some of these are outdated, some are for system support and some covers fairly special timetabling problems. These latter might later be reintroduced and future additional run options must also be expected.

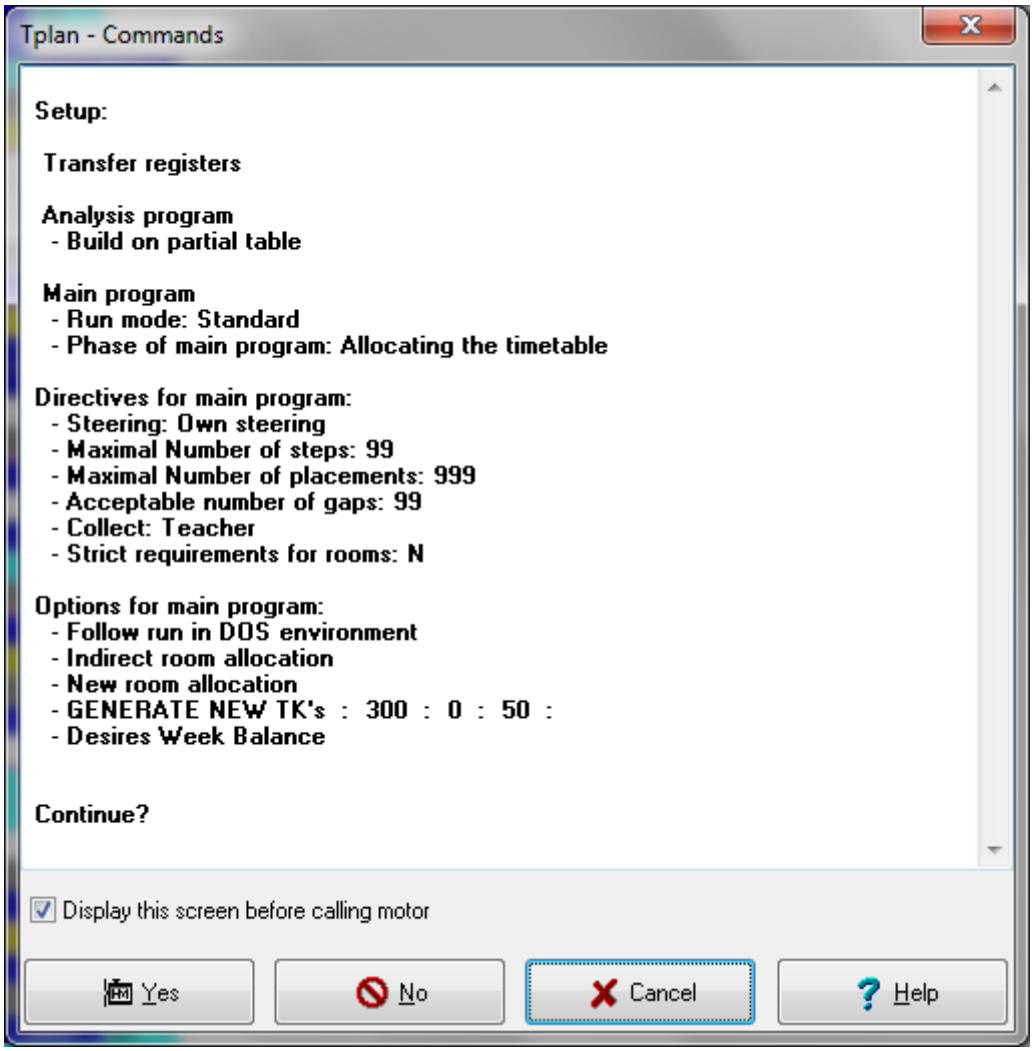
Example of creating TK-parameters



The parameters to the right are exactly the same as explained in former dialog to Analysis program

THE START OF A TIMETABLE RUN

Having filled in the parameters in previous paragraphs you are ready for a run by clicking OK in Run menu. The following information is listed:



This is a survey of what run and run parameters you are using. It is strongly recommended that you ALWAYS check this info before running.

ERROR CHECKING (Inspect button or Transfer program)

In many years both Wintp and Hmtp have performed these “grammatical” checks. Sometimes this has given a little confusion when starting a Transfer being stopped completely unnecessary. We have changed the rules for that:

- Wintp alone is completely in charge of all “grammar” checking. Transfer is immediately stopped each time a formal error is detected. I have found these checks to be very reliable and even better you are easily transferred to the spot where there is an error. I personally use these checks to a large extent and am very glad for this thorough cleaning of data. The beginner or average user should be even happier by getting rid of the main bulk of errors before starting serious timetabling.
- It happens that HMTP must overrule all warnings coming from Wintp meaning that a transfer is attempted regardless which errors Wintp might detect. That is done with a run option (which ought to be used with some reservation.) The typical cases are these:
    a. In the odd case Wintp report about errors about things which Hmtp permits.
    b. In some cases Wintp reports correctly about errors which I know have no effect for the continued timetable run.

c. In some cases there might occur grammatical errors of a complex nature for instance inconsistencies between block register and subject register. The only way to find such errors is to force a complete transfer and carefully check what really happened.

As we gain more experience I expect the two first points above while I expect that we will have to live the last point.

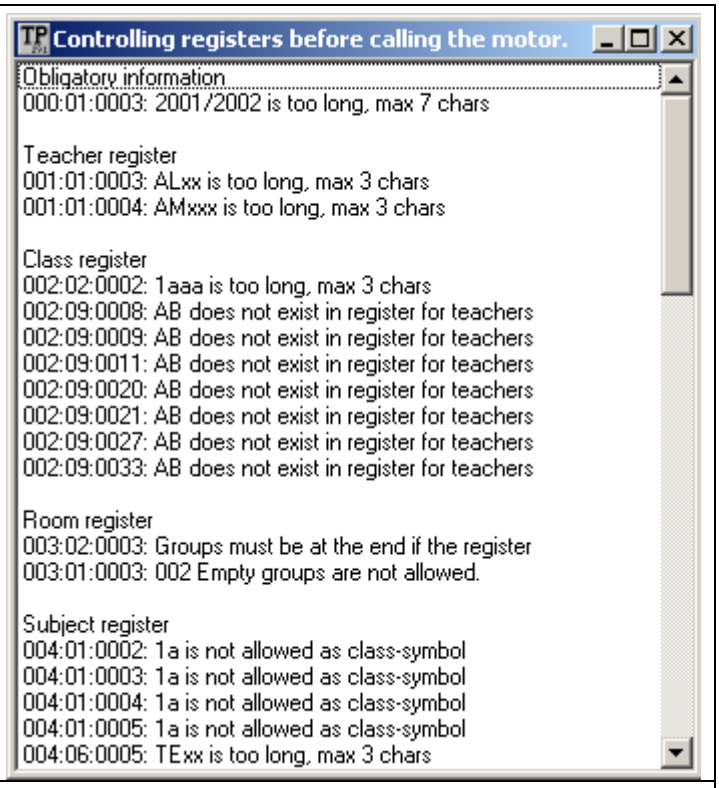
We will next show an example where we artificially have entered some formal errors:

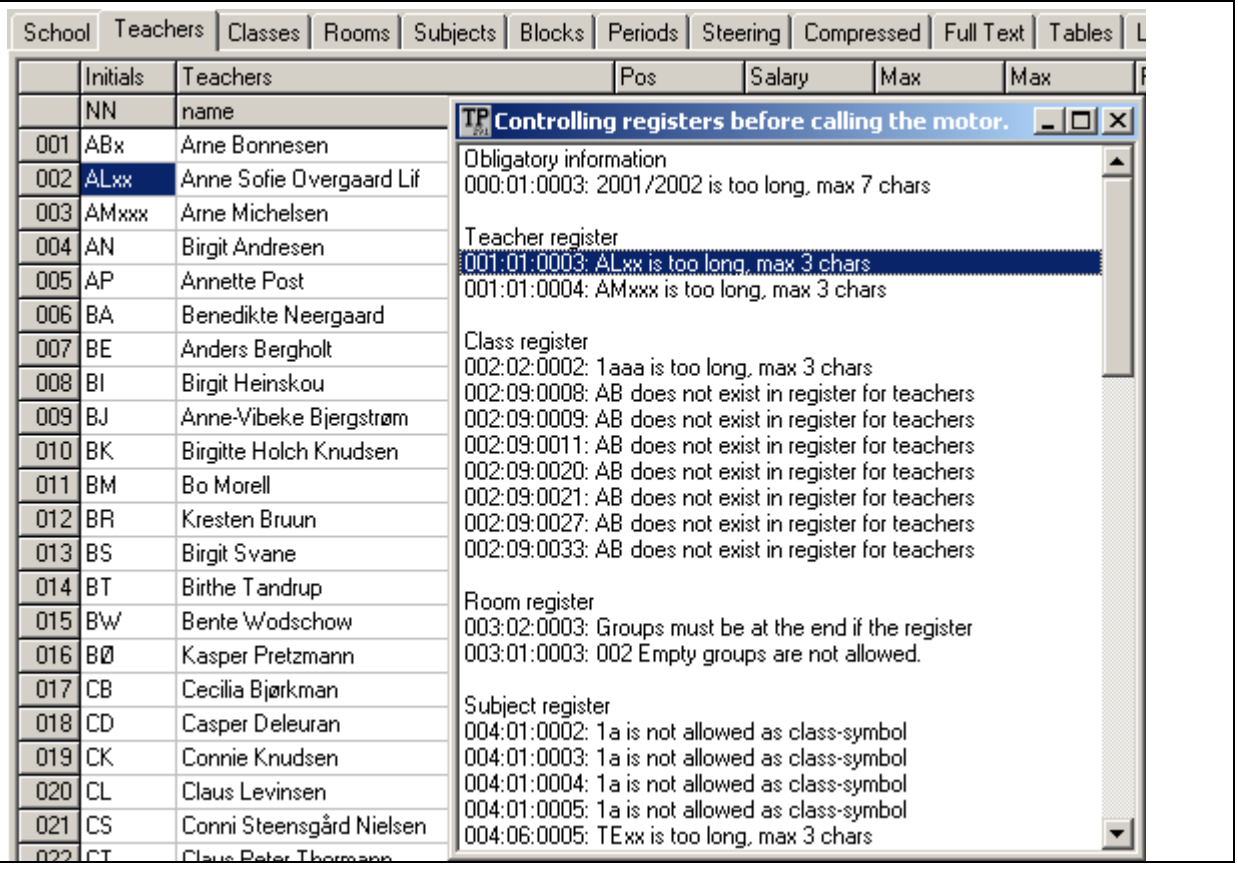
These looks scaring but wait a little.

We click on the first error in teacher register and get this listing.

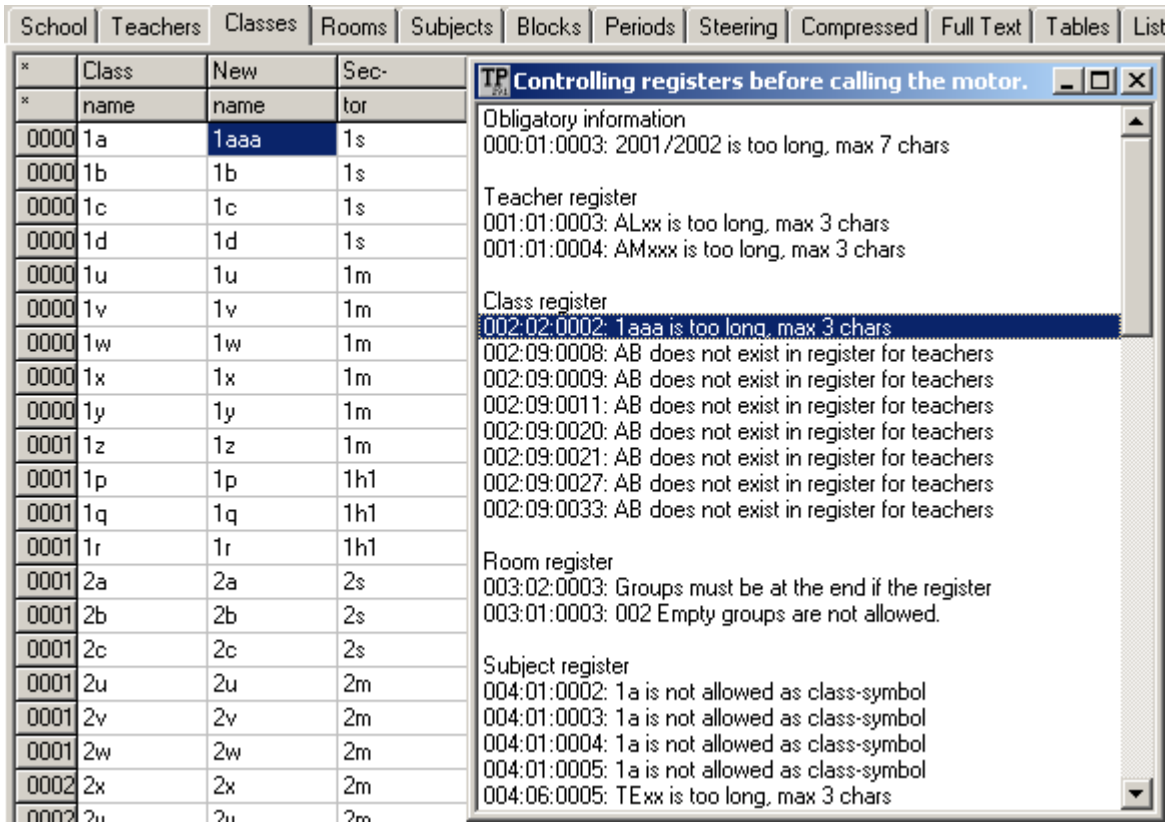
We immediate see there is something wrong with teacher AB and AL.

We remove the x'es here and continue.



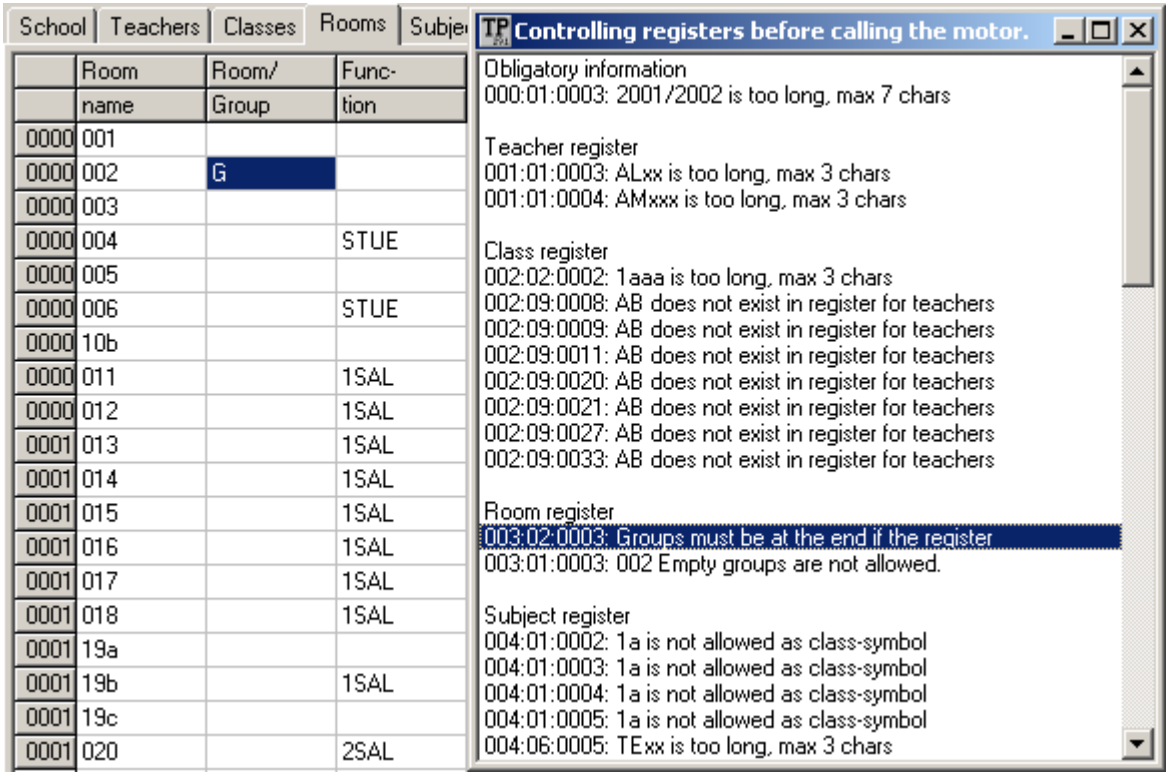


Next we check the class register and get this listing:



*	Class name	New name	Sec-tor
0000	1a	1aaa	1s
0000	1b	1b	1s
0000	1c	1c	1s
0000	1d	1d	1s
0000	1u	1u	1m
0000	1v	1v	1m
0000	1w	1w	1m
0000	1x	1x	1m
0000	1y	1y	1m
0001	1z	1z	1m
0001	1p	1p	1h1
0001	1q	1q	1h1
0001	1r	1r	1h1
0001	2a	2a	2s
0001	2b	2b	2s
0001	2c	2c	2s
0001	2u	2u	2m
0001	2v	2v	2m
0001	2w	2w	2m
0002	2x	2x	2m

It is quite obvious that we have wrongly entered 1aaa instead of 1a. By correcting that most of the errors above disappear. What remains is room register:



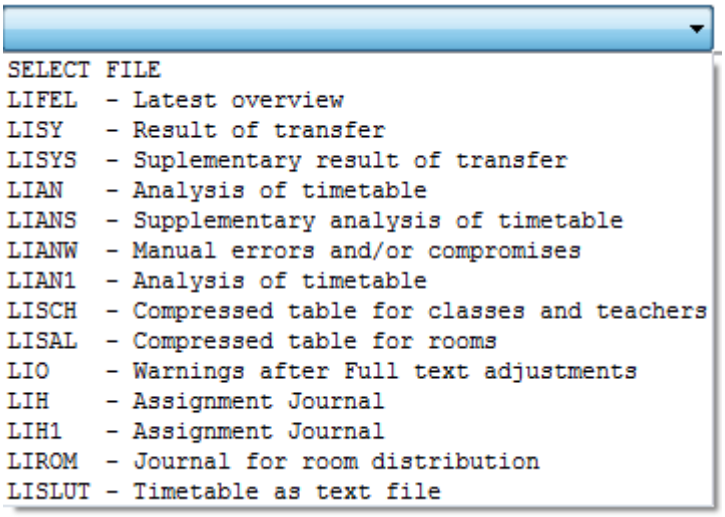
	Room name	Room/ Group	Func-tion
0000	001		
0000	002	G	
0000	003		
0000	004		STUE
0000	005		
0000	006		STUE
0000	10b		
0000	011		1SAL
0000	012		1SAL
0001	013		1SAL
0001	014		1SAL
0001	015		1SAL
0001	016		1SAL
0001	017		1SAL
0001	018		1SAL
0001	19a		
0001	19b		1SAL
0001	19c		
0001	020		2SAL

It is quite obvious that the G for room 002 is completely wrong and we remove that. Now almost all errors we started with have disappeared. Ok, this was an artificial example and real life is more

complex than that. However, having spent a lifetime looking for such rubbish errors, I consider the shown technique as an enormous improvement.

LISTINGS FROM A TIMETABLE RUN

By clicking on Tab sheet: Listings (and arrow for drop down box) you get access to the various listings from a timetable run:



This is considerably modified compared with earlier versions of Tplan for several reasons:

Since we have removed all ASCII output of complete tables, these are no longer needed.

We have also removed some files which we expect that a standard user don't needs. (These files may still be accessed if you classify yourself as Advanced User.)

On the other hand we have split the older file Lisy in two files Lisy + LisyS and the older file Lian is split in 3 files Lian + LianS + LianW. The idea is to simplify life for the user. Earlier I noticed that since files Lisy and Lian could contain a lot of information, many users overlooked parts of info which were important. Hopefully this reorganization makes important information simpler to detect.

The output listings from Tplan are for the moment:

LIFEL: Latest result from Control Menu.

LISY: Result from Transfer. If you ask for complete warnings this is all info from a Transfer

LISYS: When the result of a Transfer is satisfactory we move supplementary info from transfer to this file and only keep vital info from Transfer in file Lisy.

LIAN: Result from Analysis. If you ask for complete listings this is all info from an Analysis.

LIANS: The initial info in LIAN might appear huge and difficult to survey. As soon as the Analysis appears to be rid of most errors, get most of the info to LIANS, and what remains in LIAN are vital info perhaps needing further checking.

LIANW: Manual errors and/or compromises. Initially this file contains inconsistencies between Block/subject – register and Period – register. In the later adjustment phase this contains vital info about the various compromises you have made and which perhaps need further fine tuning.

LIAN1: Analysis of timetable- Supplementary run. Very seldom used information.

LISCH: Compressed tables for classes and teachers. Still an old favourite of mine and in old DOS-days the most important result from a timetable run. These days it offers you a fast way of creating a paper copy of the table you have onscreen.

LISAL: Compressed tables for rooms and contains also info about lacking rooms (or the latter is moved to file LIANW)

LIROM: Journal for the room allocation. Fairly seldom you need this information, but in case I feel that room allocation is lousy, I will inspect this file, and then I will often find what is wrong with the original room register.

LIH: Assignment journal from main program. Shows step by step what happened in the previous main run. For the experienced user of Tplan this info might be very valuable and in many cases teaching you to give a better steering for an improved run.

LIH1: Assignment journal from main program- Supplementary run. Less important information. It is normal that this file might contain a few additional assignments. In case there are many assignments here, I might suspect that something is wrong.

LIO: Warnings after a full text adjustment. This is an older file, and it is in many ways an equivalent to the more recent file LIANW and should in theory contain the same information. Time has not permitted me to revise the file LIO and these days I rely more on the file LIANW.

LISLUT: Timetable as a text file. The table onscreen is converted to a paper copy. To be honest I have never used this info since my preference is files like LISCH and LISAL.

6 Manual adjustments of timetables

(Drag/drop – techniques)

INTRODUCTION

This chapter is a provisional replacement of Chapter 6 in current User Manual which is more or less outdated. The facilities explained here is perhaps the main reason for creating Tplan29.1, and the implementation of these facilities has also been by far the most time-consuming part of our recent developments of Tplan 29.1

Most of my professional work since the mid sixties has centred on the task of manual adjustment of (compressed) timetables since I had to make a living one way or another. I will not tell about the techniques of yester, but surely since the early 90-ties I dreamt about a facility which would allow me to point at some activity and then place it in a different place in the timetable. That would indeed speed up the manual work when adjusting a timetable. I wrote a routine for that in pre-Windows time, and confess that my effort was a disaster since the computing world was not that progressed at that point in time. Then we got Windows and I got other problems. We created Tplan 26 (no concern for drag/drop) and Tplan 28 (where drag/drop were superficially considered but skipped because of all other new facilities in 28.)

Initially I was very pleased with the manual adjustment possibilities in Tplan 28, but as the years went by (say 2008) I felt a growing uneasiness as we still lacked drag/drop which now was common in almost any Windows software, Drag/drop with current standards is in itself a trivial operation, However, we had additional problems since the info we collected from a drag/drop had to be sent to a different program system, and there the info had to be converted to logical matrixes for evaluation of timetabling consequences and these results had to be presented onscreen to allow the timetabler to decide the continued action.

One weak point in the former Tplan 28 was that it was fairly slow in the final adjustment phase and how could we consider a fast drag/drop within such a context?

Lasse and I had both operating routines for the final part of Tplan, but both had overlooked the need for speed in that phase. (I.e. both had made lousy solutions.). There was just one way out of this mess:

The internal data structure of Tplan (Wintp/Hmtp) had to be redefined.

In 2008 we discovered an important additional facility.

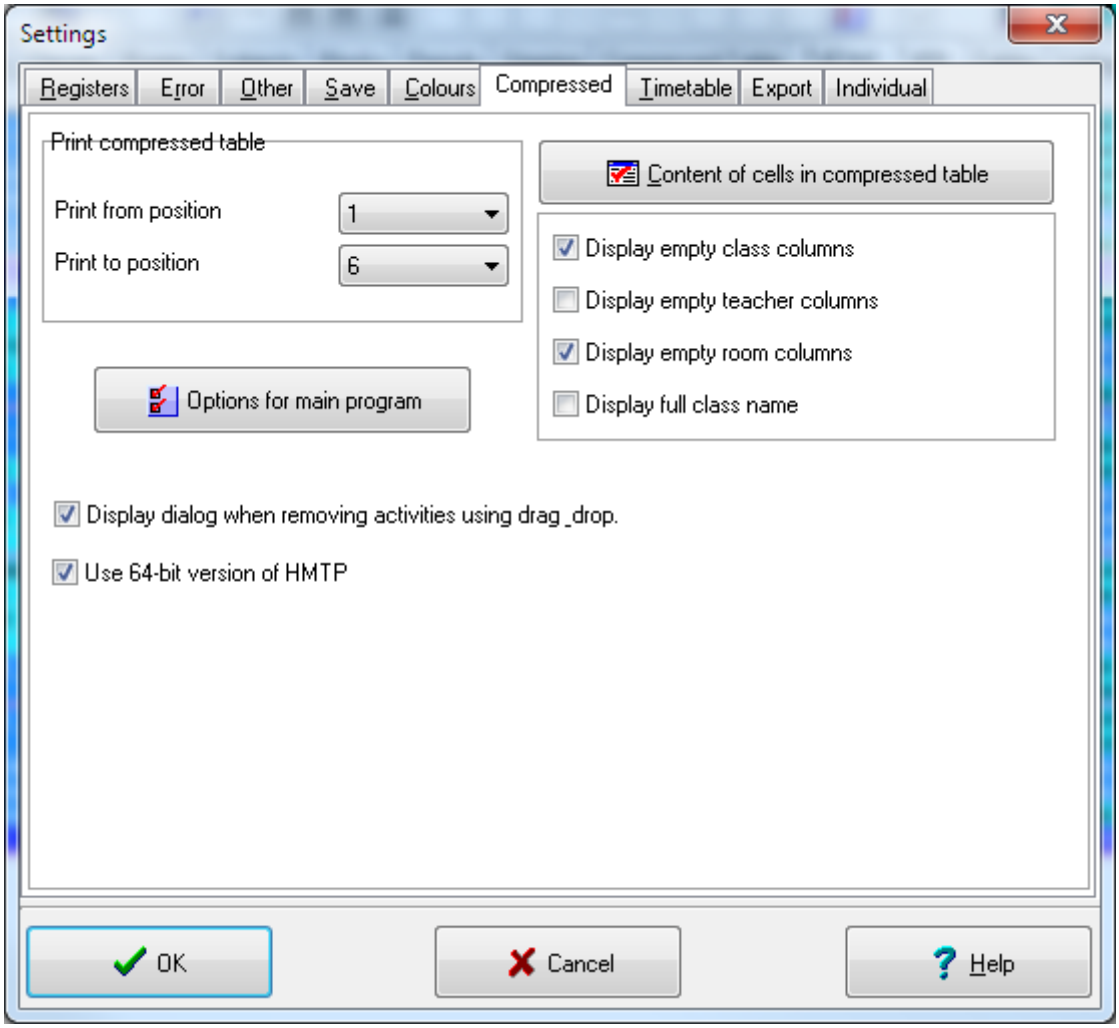
We could operate with a **"floating" Kickout list** meaning that the Kickout list may either be onscreen simultaneously as the timetable or it may be closed down with the table remaining. This opens a new world for doing drag/drop between Kickout list and the timetable.

That was our starting point autumn -08 and finally in spring – 11 we are ready to present the result. (We have exceeded expected time limit, but it had to be done, and I am far from disappointed with the end result.)

The facilities we explain in the continuation are in principle little new compared with version 28 which has similar facilities. But I have said version 28 runs slow when adjusting. Some of the dialogs are quite awkward to use and many has problems with using them in the best way. I know very well that old hands with timetables tries to use other methods for the last phase and beginners often get problems there..

The general progress in computing has reduced run times in version 29 with a factor 4 compared with older versions of 28.

If you go to Functions > Settings>Compressed, you get the following dialog:



By checking: Use 64-bit version of HMTP, and you have a 64-bit PC, you reduce the run time with a further 20 – 30 %.

Version 29 has some improved algorithms and some improved facilities. However, far more important than that, is the drastic reduction in manual effort for completing a timetable. As said I have spent my entire professional work with adjusting timetables. Hopeless to give a factor for how

much reduction in manual work using version 29, but surely I am willing to guess a factor of at least 4 here too. I guess that this last fact is **more interesting for any average user with an average complex timetable** than any algorithmic improvement in Tplan for the past 10-12 years.

The presentation here will mainly mention **the way I am using drag/drop** and for all practical purposes this is how I work with KomprGrid (I.e. Compressed timetable) and KtempGrid (I.e. a subset or selection of columns in KomprGrid.) Skimming through the pages of older chapter 6 in Manual, I feel now that we were showing too many alternative ways of adjusting tables. I also found some of the examples longwinded and boring. Here I limit my scope to these things:

- **The environment (i.e. screen interface) where we are using drag/drop.**
- **The mechanics of using drag/drop with some simple selected examples**
- **How to apply drag and drop in real life. Again some examples more complicated and some general advice is given, but no attempt to complete a table.**

The rest is left to the reader's imagination. Most of the thing I show is in KomprGrid and KtempGrid will also function in other grids, but here I can't guarantee all is free of bugs. I have now spent thousands of hours debugging drag/drop in Tplan **my way**, and I have experienced more mess onscreen than I like to talk about. So therefore: If you insist on doing adjustments in a different way than me, **the user is hereby warned!!**

When skimming through current chapter 6 in current User manual, I will mention that it was written when we introduced version 28. At that point in time I had high hopes that the simplest way to complete a timetable was to run the main program in what I call Interactive Mode (I.e. Stop a main run temporarily at once you get a kickout and adjust that immediately before continuing the main run.) Further experiences taught me that this could be a dubious technique in many cases as it often involved some manual guesswork, and I learnt that Tplan is usually far better than me for spotting problems in the continuation. Therefore I am now more in favour of tackling a complex table in a stage by stage manner by defining sensible steering directives and rank the priority levels as good as possible.

6.1 Presentation of a Compressed Timetable

- And a few simple examples of drag/drop

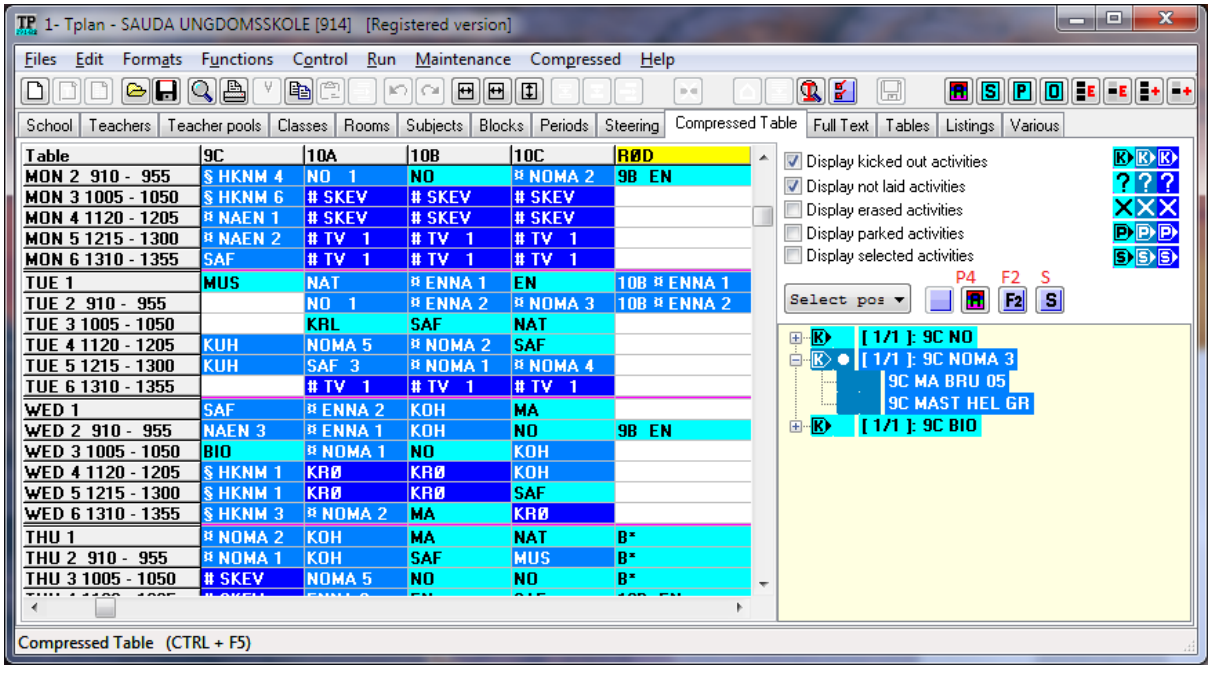


Fig. 1

The above figure shows a selection of a compressed timetable in manner which I strongly recommend you to use in a similar manner. The vital new thing in this figure is:

You see onscreen simultaneously the compressed timetable to the left and the kickout list to the right. This latter may be onscreen or off-screen by clicking ctrl + F7. That is why we call it a "floating" kickout list (You would normally prefer to have the list onscreen as long as this list is not empty)

The normal colours in the in timetable are:

Black on cyan. This activity is lectured by only one teacher, meaning of course that these activities are easiest to move around. We name such activities Pure Class activities.

White on light blue. "Small parallel" The sum of classes and teacher are 3 or 4. To some extent such activities may be moved around

White on dark blue. "Large parallel" The sum of classes and teachers is at least 5. You can only in the early stages of the timetable move such activities with ease. In the later stages they are almost impossible to move.

Notice also that the colours are used exactly the same way in the kickout list to show you what sort of kickout you have. Normally one kickout is represented by just one line in the kickout list. If you want to see all details in a kickout you "blow it up" by clicking on the + to the left of the activity and close that that by clicking on the – sign (see fig 1)

In addition we might use the following special symbols:

#	The activity is preassigned
*B	Class/teacher/room is directly blocked in this position
**	Class/teacher/room is indirectly blocked in this position
§	The activity is included in a sequence requirement.
¤	The activity is included in a same-day requirement
\	The activity shall be assigned on the boundary (border)
=	An activity to be assigned evenly on two weeks has the same no. of periods in both weeks.
+	If this activity has 1 period more in week 1 (++ = 2 periods more)
-	If this activity has 1 period more in week 2 (-- = 2 periods more)

Furthermore I think there is a detail fig 1 which I feel is important: In the compressed table I have tried reduce the cell content as much as possible, but on the other hand I am interested in the special symbols just mentioned above. (The current User Manual explains how to define the cell content). Call this a personal preference, but I have been working with this for 50 years and know the importance of having as compressed presentation as possible while looking for a solution of your various kickouts. In the final stages I will remove special symbols but make the cell content more complete in other ways.

An alternative way of presenting a partially finished timetable is as follows:

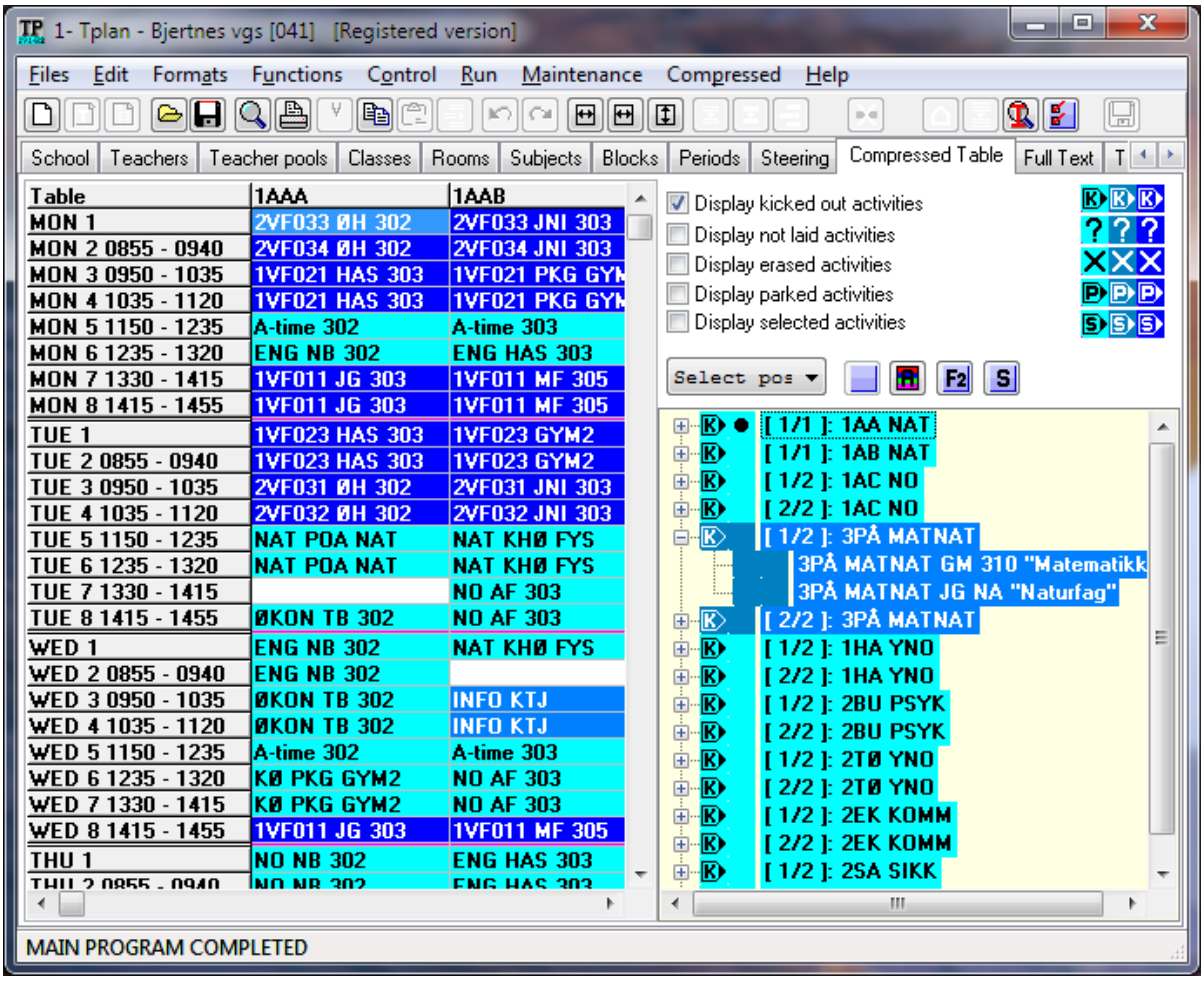


Fig. 2

This user has preferred more complete cell content than I recommend in compressed tables but skipped the special symbols I like (but you don't get a better survey to solve kickouts this way.) The kickout list to the right is no as scaring as it looks and it shows an **important new convention:**

Each single period in a multiple period is listed as a separate kickout. When you then are inserting these periods back in the compressed table, a double would then require two operations but time loss here is very small compared with what you gain in FLEXIBILITY and SIMPLICITY. For instance to place a kickout of a double period might possibly be found by assigning it as two separate singles, and likewise a kickout of two singles of same activity might eventually be adjusted as a double period. In very many cases such compromises are quite acceptable (or needed)

We give an explanation of the kickout list in fig 2:

- 1AA NAT and 1AB NAT are 2 kickouts of single activities [1/1]

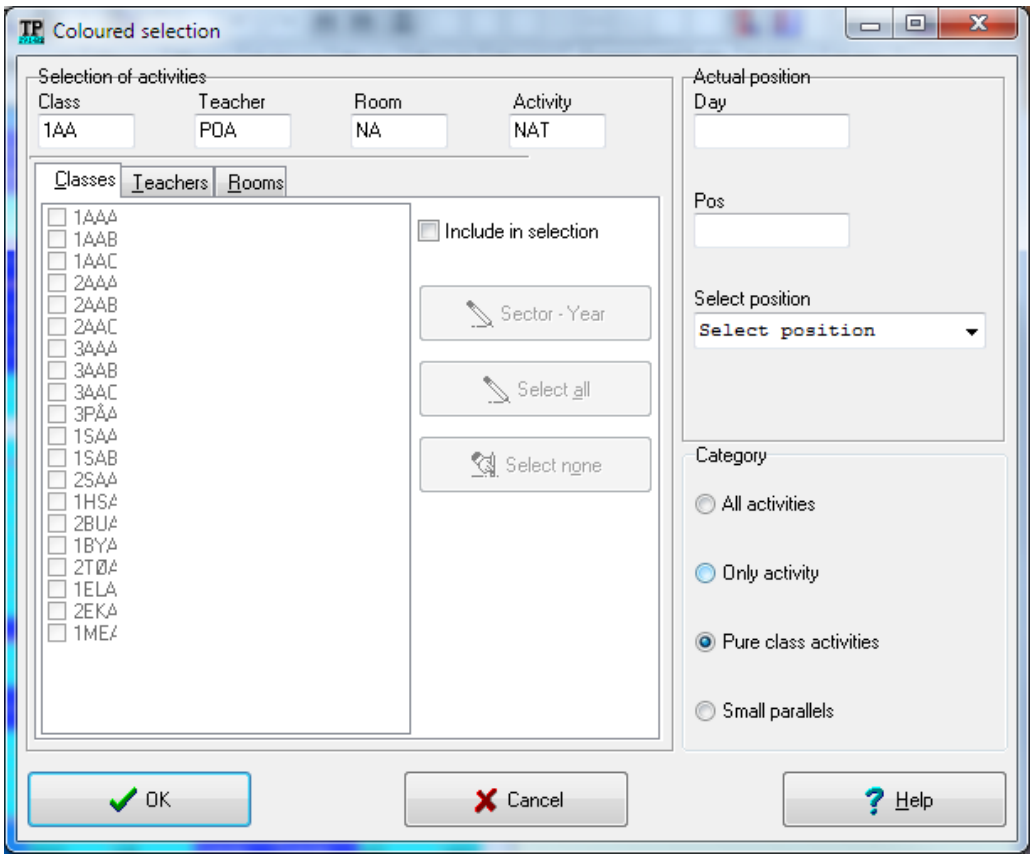
- 1AC NO is a kickout of **one** double period [1/2] and [2/2]

- 3PÅ MATNAT is also a double period and from the colour we see that this activity is a small parallel. We have blown up the first period to show the complete content of this activity.

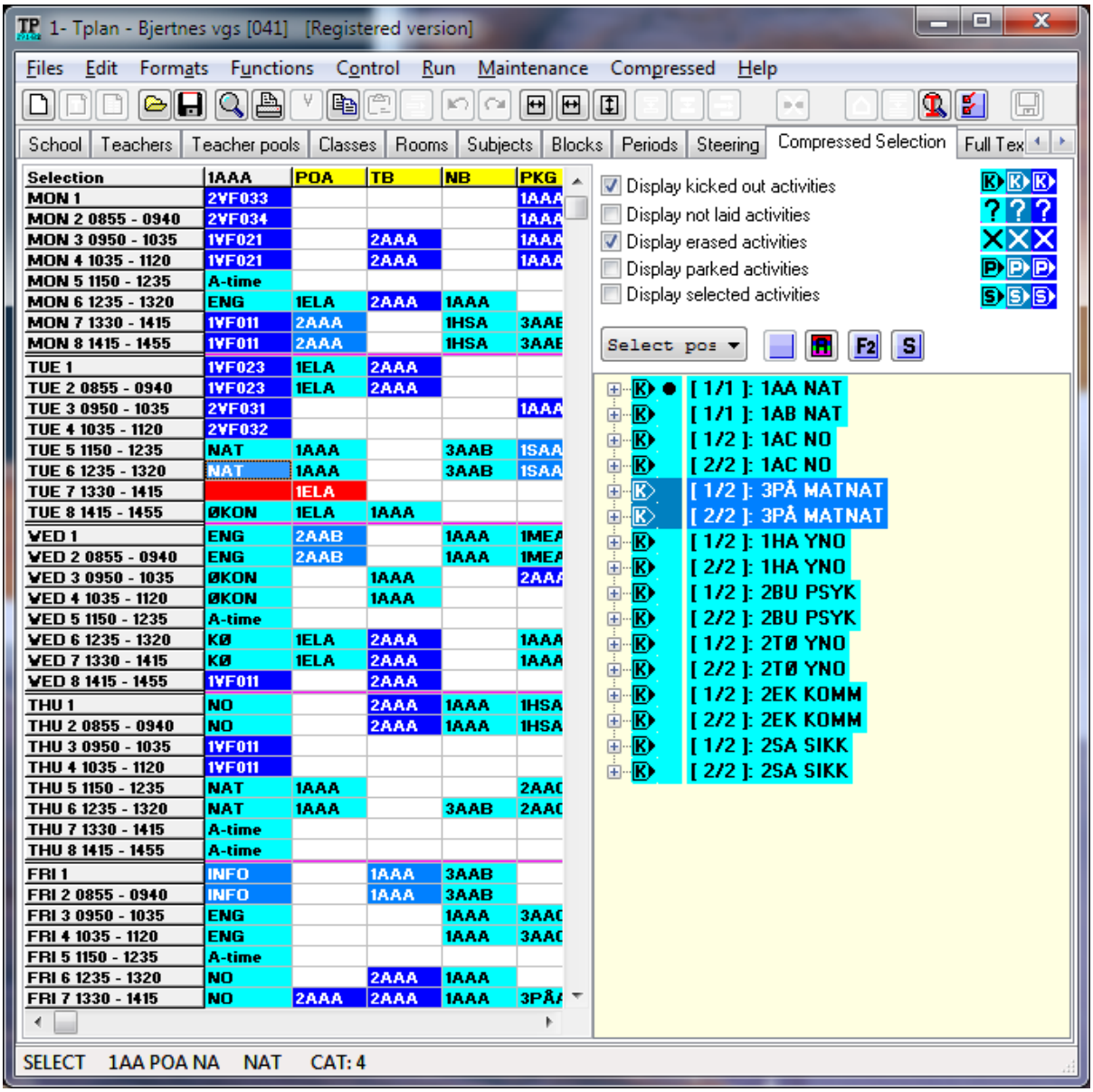
The remainder of the kickout list are several kickout of simple double periods making the list a lot less scaring; in particular since this school is not too strict about the period breakdown.

For the moment our selection is 1AA NAT (notice black dot on this activity)

To get a start with drag/drop we will adjust a few activities in fig 2 and start with 1AA NAT and click on the button named P4 in fig 1. We get the following dialog:

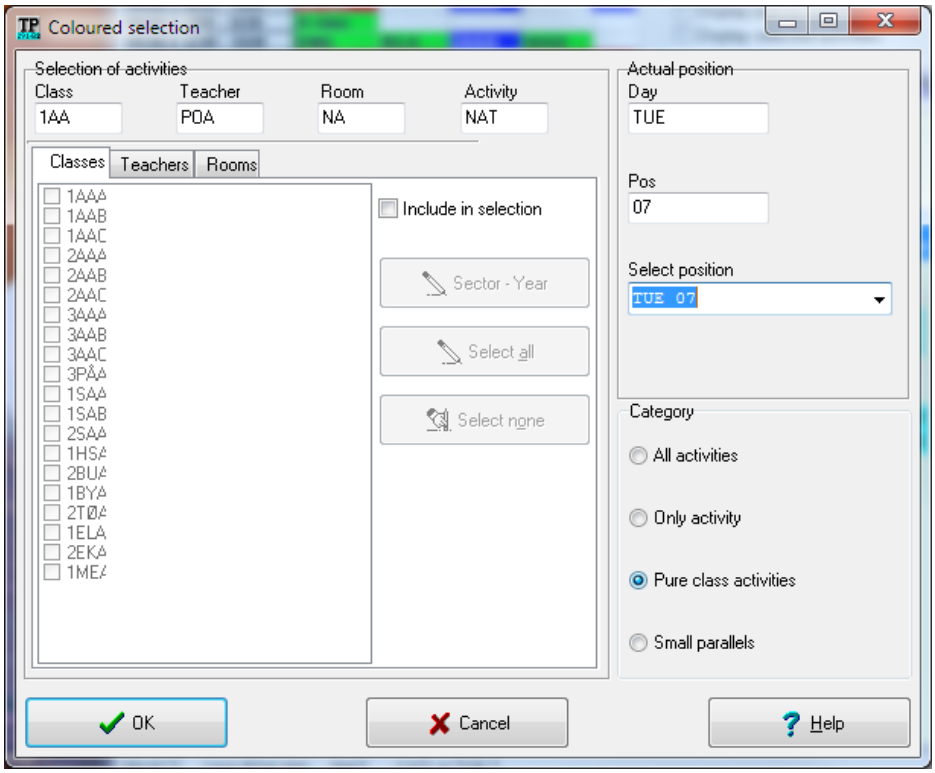


Our selection from the kickout list is shown in upper left corner and our only action is to select in the right down corner: Pure class activities (since 1AA NAT self is a pure class activity). We click OK and get this **selection** of compressed table:

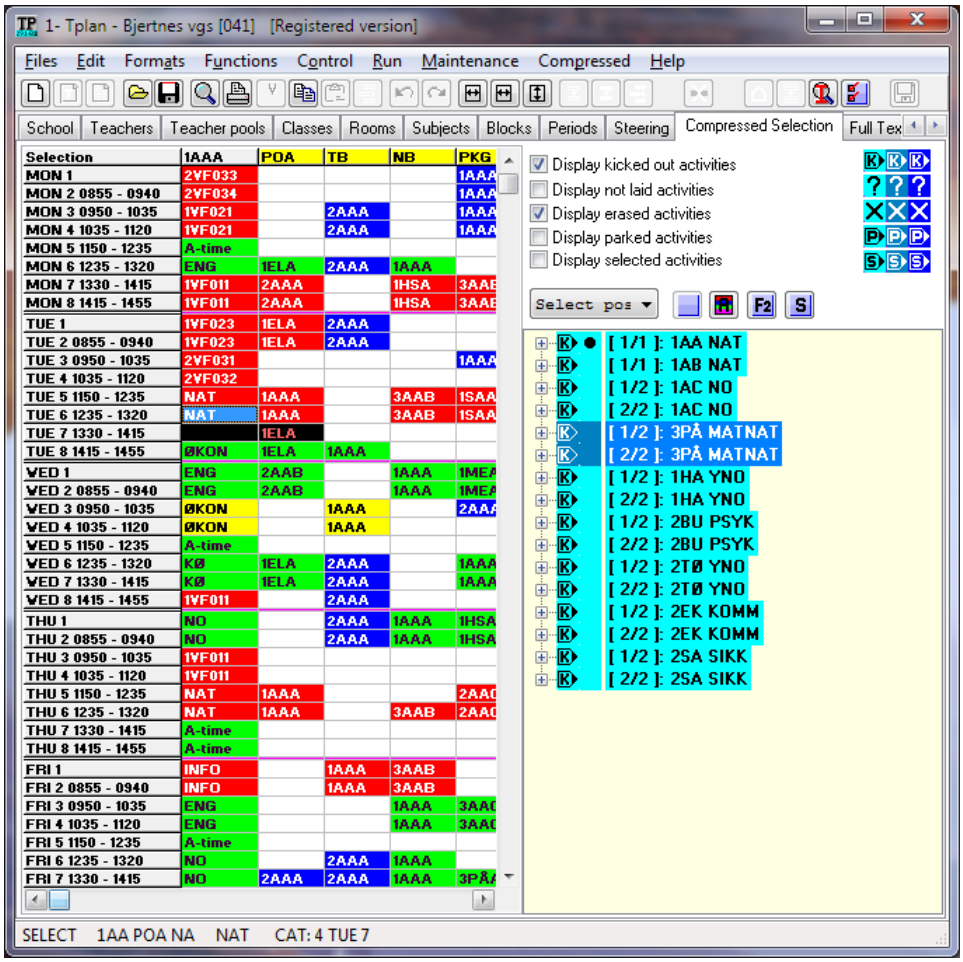


Selection	1AAA	POA	TB	NB	PKG
MON 1	2VF033				1AAA
MON 2 0855 - 0940	2VF034				1AAA
MON 3 0950 - 1035	1VF021		2AAA		1AAA
MON 4 1035 - 1120	1VF021		2AAA		1AAA
MON 5 1150 - 1235	A-time				
MON 6 1235 - 1320	ENG	1ELA	2AAA	1AAA	
MON 7 1330 - 1415	1VF011	2AAA		1HSA	3AAE
MON 8 1415 - 1455	1VF011	2AAA		1HSA	3AAE
TUE 1	1VF023	1ELA	2AAA		
TUE 2 0855 - 0940	1VF023	1ELA	2AAA		
TUE 3 0950 - 1035	2VF031				1AAA
TUE 4 1035 - 1120	2VF032				
TUE 5 1150 - 1235	NAT	1AAA		3AAB	1SAA
TUE 6 1235 - 1320	NAT	1AAA		3AAB	1SAA
TUE 7 1330 - 1415		1ELA			
TUE 8 1415 - 1455	ØKON	1ELA	1AAA		
WED 1	ENG	2AAB		1AAA	1MEA
WED 2 0855 - 0940	ENG	2AAB		1AAA	1MEA
WED 3 0950 - 1035	ØKON		1AAA		2AAA
WED 4 1035 - 1120	ØKON		1AAA		
WED 5 1150 - 1235	A-time				
WED 6 1235 - 1320	KØ	1ELA	2AAA		1AAA
WED 7 1330 - 1415	KØ	1ELA	2AAA		1AAA
WED 8 1415 - 1455	1VF011		2AAA		
THU 1	NO		2AAA	1AAA	1HSA
THU 2 0855 - 0940	NO		2AAA	1AAA	1HSA
THU 3 0950 - 1035	1VF011				
THU 4 1035 - 1120	1VF011				
THU 5 1150 - 1235	NAT	1AAA			2AAC
THU 6 1235 - 1320	NAT	1AAA		3AAB	2AAC
THU 7 1330 - 1415	A-time				
THU 8 1415 - 1455	A-time				
FRI 1	INFO		1AAA	3AAB	
FRI 2 0855 - 0940	INFO		1AAA	3AAB	
FRI 3 0950 - 1035	ENG			1AAA	3AAC
FRI 4 1035 - 1120	ENG			1AAA	3AAC
FRI 5 1150 - 1235	A-time				
FRI 6 1235 - 1320	NO		2AAA	1AAA	
FRI 7 1330 - 1415	NO	2AAA	2AAA	1AAA	3PÅA

We see that 1AA is available in TUE 7 while actual teacher POA is teaching elsewhere in TUE 7. We also see tables for other teachers in pure class activities in 1AA. From this figure it shouldn't be too difficult to spot a possible compromise, but we will show how Tplan could lead you to a solution. (In the general case things may be far more complicated than in the above figure.). We click on the P4 button once more and get the same dialog as before:



From a dropdown list we select TUE 7 (our actual period) in the upper right corner and click OK. We get this **colour selection** now:



In the status bar (at the bottom of the screen) we see our selection 1AA NAT.

Category: 4 (i.e. pure class) and actual period: TUE 7. The colours in figure show:

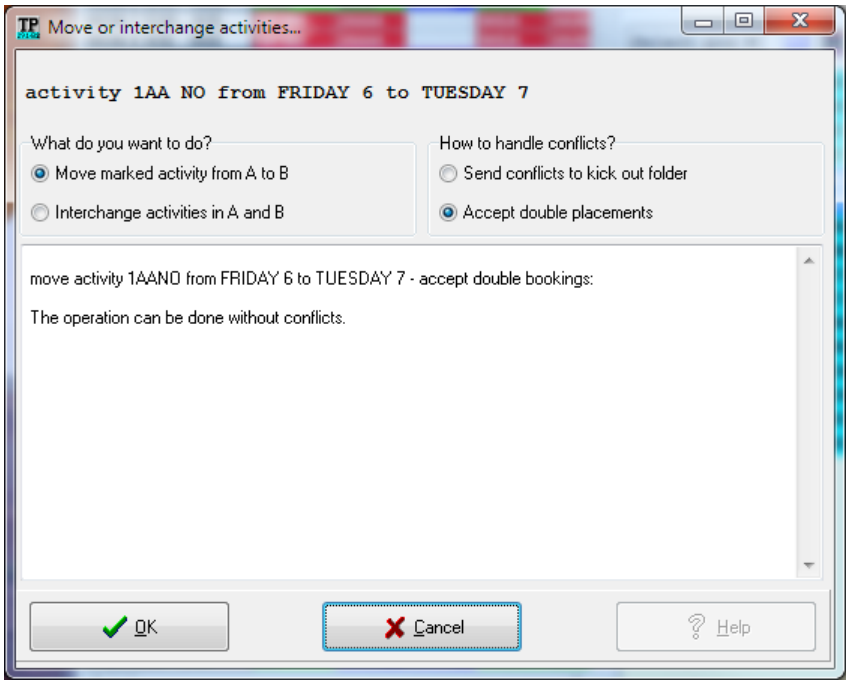
Red: You can't interchange/ move an act. from 1AA in this period to TUE 7

Green: You are permitted to interchange/ move this activity in 1AA to TUE 7 (For other reasons you are not allowed move the subject A-time in this example.)

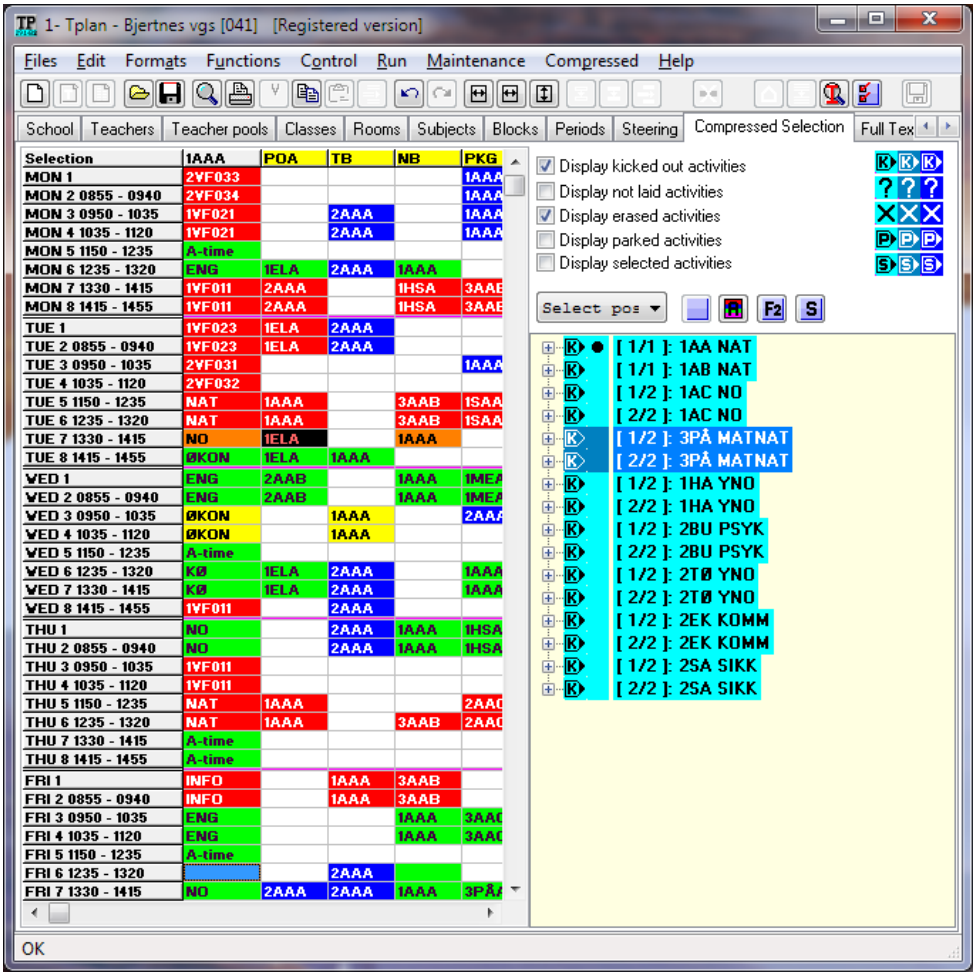
Yellow: You may interchange/move this period with TUE 7, but you will then break a day conflict.

In the figure above we are most interested in the green periods and these periods should also have POA available to be able to place 1AA NAT here. That is fulfilled for FRI 6 and we have found a solution:

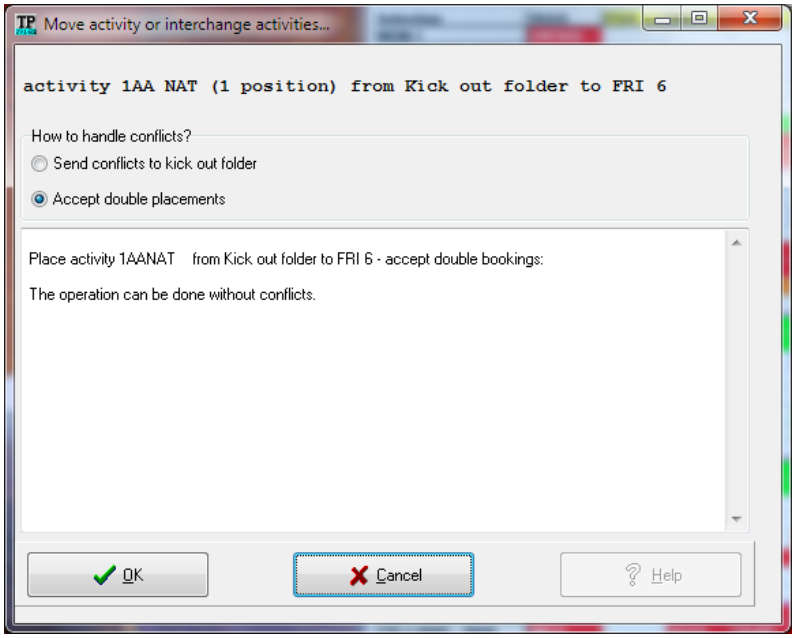
Click on FRI 6 with left mouse and DRAG that to TUE 7 and DROP it here. Tplan reacts to this with this dialog:



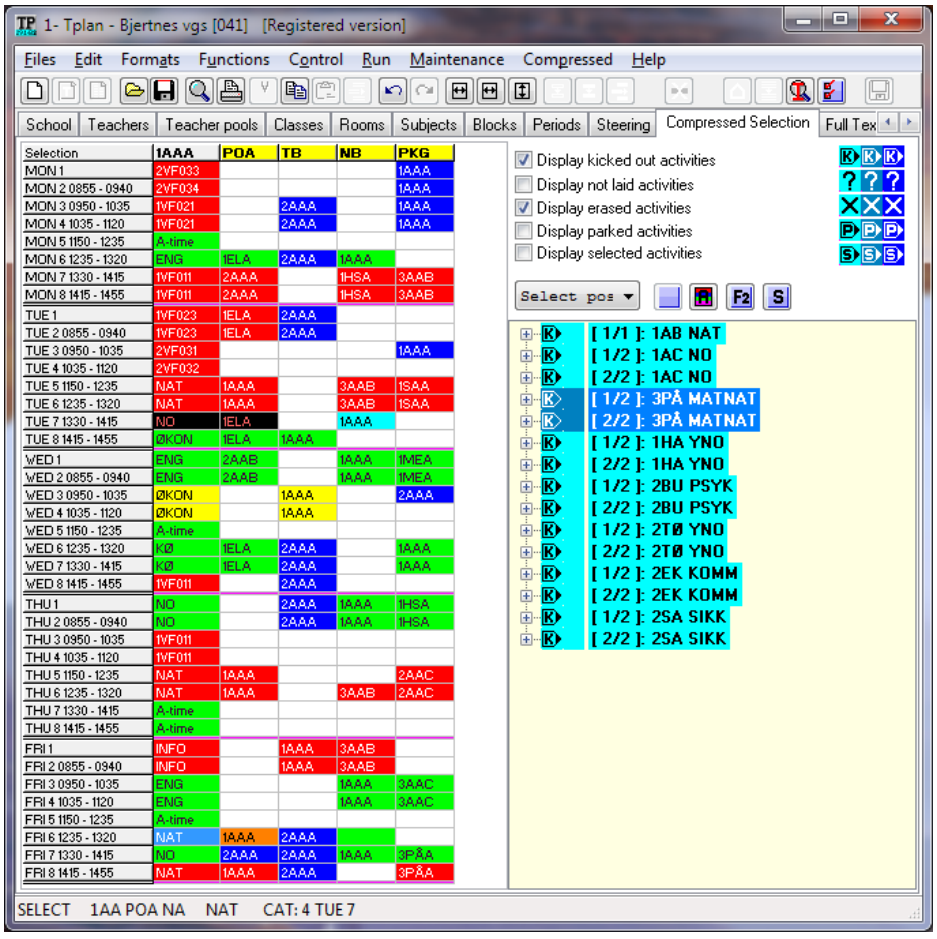
There is no problem here. We click OK and our selection is modified this way:



We have done our first drag/drop and moved an activity from FRI 6 to TUE 7. We call this a P2-operation. Next we click on 1AA NAT in kickout list and DRAG that to FRI 6 where we DROP it. Tplan responds with this dialog:

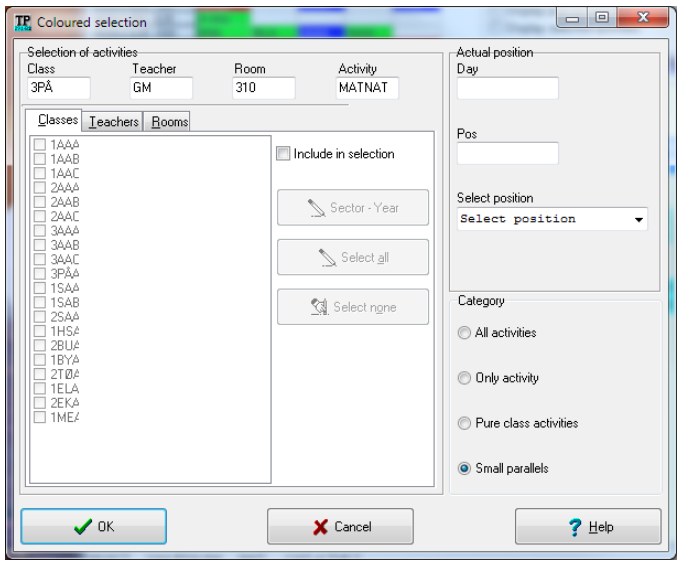


No problem here. We click OK and KtempGrid is modified this way:

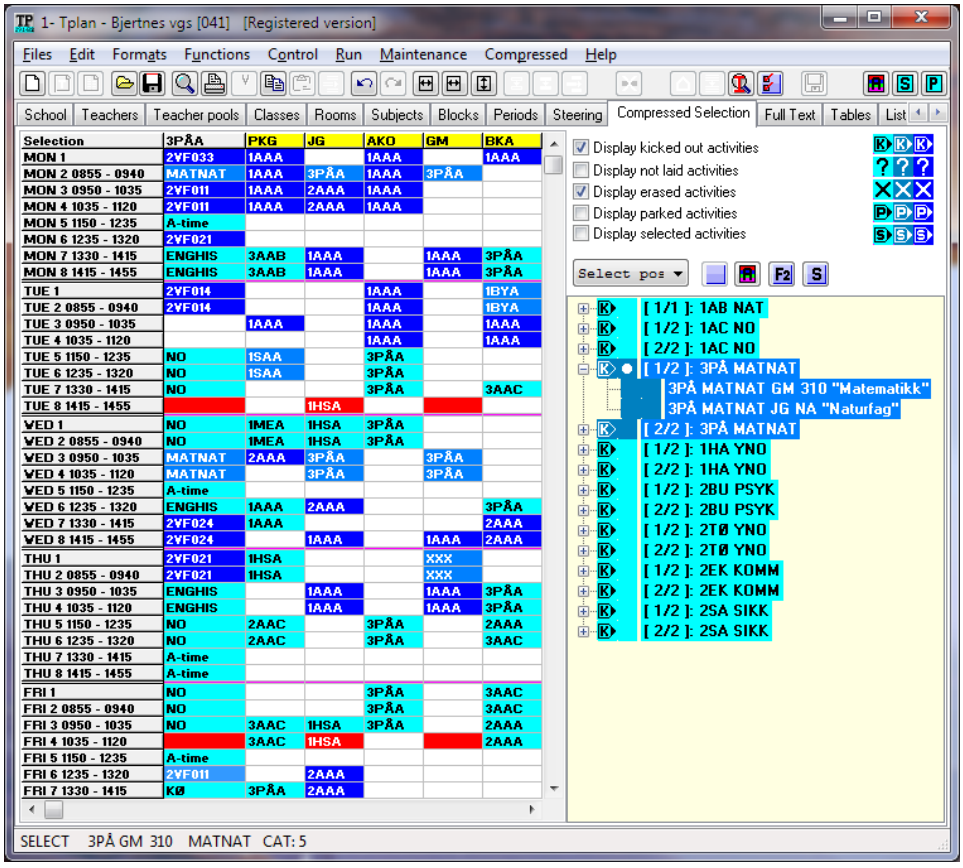


We have performed our second drag/drop i.e. moved an activity from kickout list to compressed table. We call this a P1- operation. Notice that 1AA NAT has disappeared from kickout list

We have done our first very simple adjustment. It required some figures and comments to explain what is going on, but in real life this problem is solved after a few seconds. We will adjust a slightly more complicated in kickout list and select 3PÅ MATNAT which is a double period and containing several teachers. We start with P4 button just same way as previous example and get:



This time we select Small parallels as category since our current activity is also a small parallel. We get this KtempGrid:



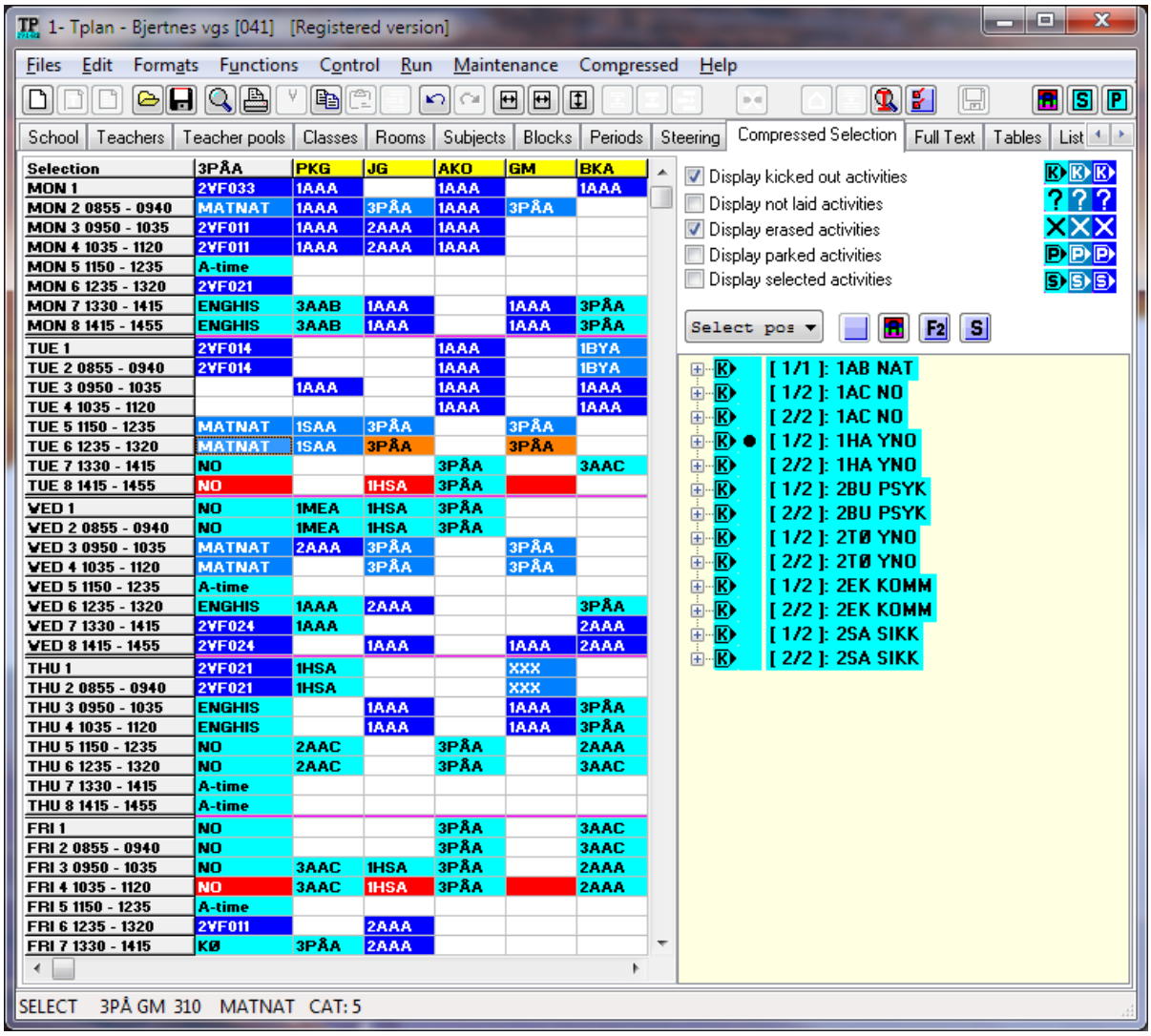
The interesting periods are TUE 8 and FRI 4 where 3PÅ is available but teacher JG is occupied here. There are several ways of solving this problem and it would require many figures to show all stages in this adjustment. Instead I will give a verbal description of one way of doing it:

We notice that teacher AKO has many periods in subject NO in 3PÅ. He is also available in TUE 8 and FRI 4. There are reasons to believe that the period breakdown maybe modified for this subject.

One possibility is: Move 3PÅ NO from TUE 5 to FRI 4. Move 3PÅ NO from TUE 6 to TUE 8. We do these adjustments with two P2 – operations

JG and GM are both available in TUE 5- 6. With two P1- operations we move 3PÅ MATNAT from kickout list to respectively TUE 5 and TUE 6.

The end result of these 4 drag/drop operations is shown in this figure:



Selection	3PÅA	PKG	JG	AKO	GM	BKA
MON 1	2VF033	1AAA		1AAA		1AAA
MON 2 0855 - 0940	MATNAT	1AAA	3PÅA	1AAA	3PÅA	
MON 3 0950 - 1035	2VF011	1AAA	2AAA	1AAA		
MON 4 1035 - 1120	2VF011	1AAA	2AAA	1AAA		
MON 5 1150 - 1235	A-time					
MON 6 1235 - 1320	2VF021					
MON 7 1330 - 1415	ENGHIS	3AAB	1AAA		1AAA	3PÅA
MON 8 1415 - 1455	ENGHIS	3AAB	1AAA		1AAA	3PÅA
TUE 1	2VF014			1AAA		1BYA
TUE 2 0855 - 0940	2VF014			1AAA		1BYA
TUE 3 0950 - 1035		1AAA		1AAA		1AAA
TUE 4 1035 - 1120				1AAA		1AAA
TUE 5 1150 - 1235	MATNAT	1SAA	3PÅA		3PÅA	
TUE 6 1235 - 1320	MATNAT	1SAA	3PÅA		3PÅA	
TUE 7 1330 - 1415	NO			3PÅA		3AAC
TUE 8 1415 - 1455	NO		1HSA	3PÅA		
WED 1	NO	1MEA	1HSA	3PÅA		
WED 2 0855 - 0940	NO	1MEA	1HSA	3PÅA		
WED 3 0950 - 1035	MATNAT	2AAA	3PÅA		3PÅA	
WED 4 1035 - 1120	MATNAT		3PÅA		3PÅA	
WED 5 1150 - 1235	A-time					
WED 6 1235 - 1320	ENGHIS	1AAA	2AAA			3PÅA
WED 7 1330 - 1415	2VF024	1AAA				2AAA
WED 8 1415 - 1455	2VF024		1AAA		1AAA	2AAA
THU 1	2VF021	1HSA			XXX	
THU 2 0855 - 0940	2VF021	1HSA			XXX	
THU 3 0950 - 1035	ENGHIS		1AAA		1AAA	3PÅA
THU 4 1035 - 1120	ENGHIS		1AAA		1AAA	3PÅA
THU 5 1150 - 1235	NO	2AAC		3PÅA		2AAA
THU 6 1235 - 1320	NO	2AAC		3PÅA		3AAC
THU 7 1330 - 1415	A-time					
THU 8 1415 - 1455	A-time					
FRI 1	NO			3PÅA		3AAC
FRI 2 0855 - 0940	NO			3PÅA		3AAC
FRI 3 0950 - 1035	NO	3AAC	1HSA	3PÅA		2AAA
FRI 4 1035 - 1120	NO	3AAC	1HSA	3PÅA		2AAA
FRI 5 1150 - 1235	A-time					
FRI 6 1235 - 1320	2VF011		2AAA			
FRI 7 1330 - 1415	KØ	3PÅA	2AAA			

This proved to be a fairly simple adjustment. The main point of this exercise was to show the simplicity and flexibility of managing multiple periods when you use a single period as basis for drag/drop- operations.

6.2 The basic Drag/drop- and supplementary- operators

In earlier versions of Tplan each operator had specific buttons leading to dialogs for giving further information. We have the same functionality today, but drag/drop makes many buttons and dialogs unnecessary and things are now handled in a much simpler and faster way

6.2.1 P4: Selection/Colouring (Advanced Selection)

This operator is still used in much the same way as in earlier versions. There is one P4 button for the kickout list. If you want to make a selection from an activity in compressed table, there is also a P4 – button in main bar.

This operator does not modify the timetables itself, but in many ways this is **the most important operator** since it performs these two tasks:

- It creates the selection of class/teacher/room tables in such a manner that you see various possibilities for assigning the next problematic activity.
- The positions in the tables are coloured according to certain rules, and these colours tell a lot about which position to select for the next assignment.P4 is called in a number of different contexts, and we might define our selection criteria in a nuanced way. The most usual way of using P4 will be to select some activity in KomprGrid, KtempGrid or UtsGrid and next clicking P4 – button

The next figure shows a section of a complete compressed table:

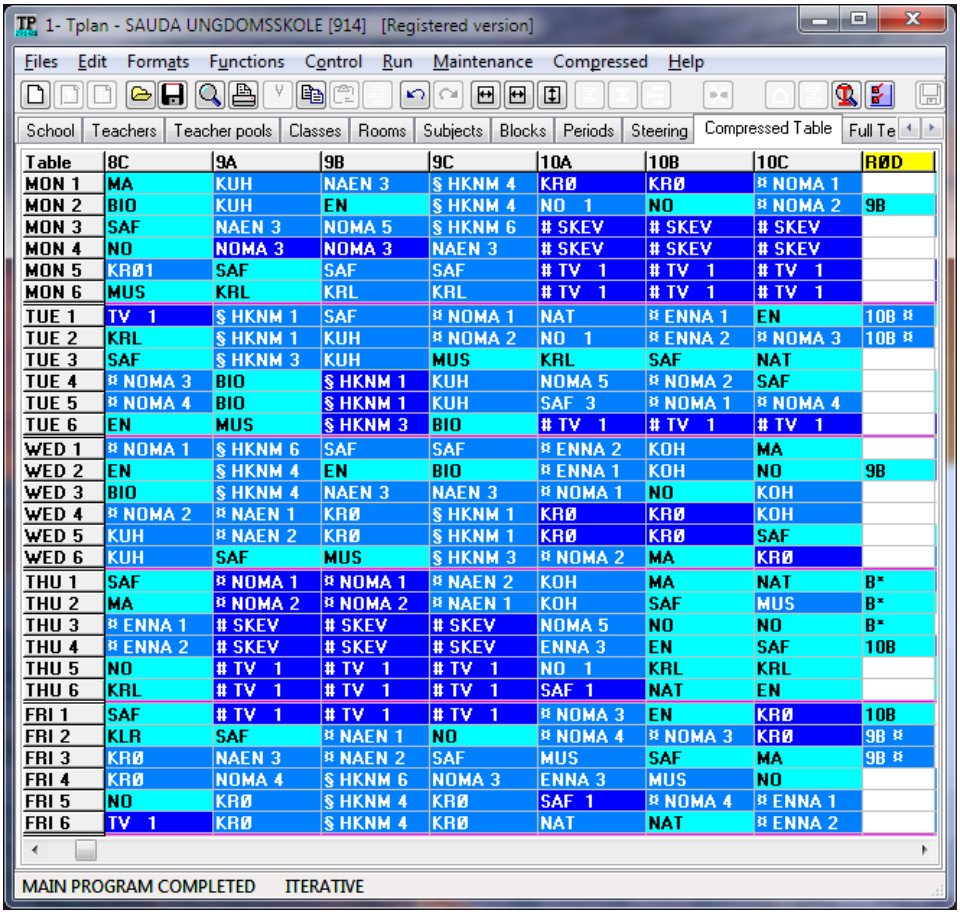
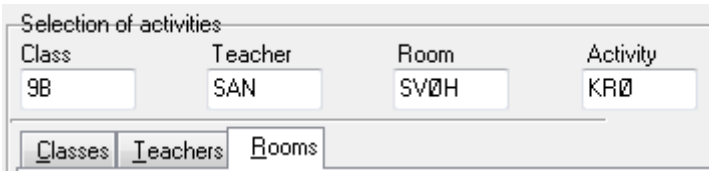


Table	8C	9A	9B	9C	10A	10B	10C	RØD
MON 1	MA	KUH	NAEN 3	§ HKNM 4	KRØ	KRØ	¤ NOMA 1	
MON 2	BIO	KUH	EN	§ HKNM 4	NO 1	NO	¤ NOMA 2	9B
MON 3	SAF	NAEN 3	NOMA 5	§ HKNM 6	# SKEV	# SKEV	# SKEV	
MON 4	NO	NOMA 3	NOMA 3	NAEN 3	# SKEV	# SKEV	# SKEV	
MON 5	KRØ1	SAF	SAF	SAF	# TV 1	# TV 1	# TV 1	
MON 6	MUS	KRL	KRL	KRL	# TV 1	# TV 1	# TV 1	
TUE 1	TV 1	§ HKNM 1	SAF	¤ NOMA 1	NAT	¤ ENNA 1	EN	10B ¤
TUE 2	KRL	§ HKNM 1	KUH	¤ NOMA 2	NO 1	¤ ENNA 2	¤ NOMA 3	10B ¤
TUE 3	SAF	§ HKNM 3	KUH	MUS	KRL	SAF	NAT	
TUE 4	¤ NOMA 3	BIO	§ HKNM 1	KUH	NOMA 5	¤ NOMA 2	SAF	
TUE 5	¤ NOMA 4	BIO	§ HKNM 1	KUH	SAF 3	¤ NOMA 1	¤ NOMA 4	
TUE 6	EN	MUS	§ HKNM 3	BIO	# TV 1	# TV 1	# TV 1	
WED 1	¤ NOMA 1	§ HKNM 6	SAF	SAF	¤ ENNA 2	KOH	MA	
WED 2	EN	§ HKNM 4	EN	BIO	¤ ENNA 1	KOH	NO	9B
WED 3	BIO	§ HKNM 4	NAEN 3	NAEN 3	¤ NOMA 1	NO	KOH	
WED 4	¤ NOMA 2	¤ NAEN 1	KRØ	§ HKNM 1	KRØ	KRØ	KOH	
WED 5	KUH	¤ NAEN 2	KRØ	§ HKNM 1	KRØ	KRØ	SAF	
WED 6	KUH	SAF	MUS	§ HKNM 3	¤ NOMA 2	MA	KRØ	
THU 1	SAF	¤ NOMA 1	¤ NOMA 1	¤ NAEN 2	KOH	MA	NAT	B*
THU 2	MA	¤ NOMA 2	¤ NOMA 2	¤ NAEN 1	KOH	SAF	MUS	B*
THU 3	¤ ENNA 1	# SKEV	# SKEV	# SKEV	NOMA 5	NO	NO	B*
THU 4	¤ ENNA 2	# SKEV	# SKEV	# SKEV	ENNA 3	EN	SAF	10B
THU 5	NO	# TV 1	# TV 1	# TV 1	NO 1	KRL	KRL	
THU 6	KRL	# TV 1	# TV 1	# TV 1	SAF 1	NAT	EN	
FRI 1	SAF	# TV 1	# TV 1	# TV 1	¤ NOMA 3	EN	KRØ	10B
FRI 2	KLR	SAF	¤ NAEN 1	NO	¤ NOMA 4	¤ NOMA 3	KRØ	9B ¤
FRI 3	KRØ	NAEN 3	¤ NAEN 2	SAF	MUS	SAF	MA	9B ¤
FRI 4	KRØ	NOMA 4	§ HKNM 6	NOMA 3	ENNA 3	MUS	NO	
FRI 5	NO	KRØ	§ HKNM 4	KRØ	SAF 1	¤ NOMA 4	¤ ENNA 1	
FRI 6	TV 1	KRØ	§ HKNM 4	KRØ	NAT	NAT	¤ ENNA 2	

Figure 6.1

For some reason we want to move 9B KRØ (i.e. PE) in WED 4 somewhere else. We click on that cell and then P4 in Main Bar. We enter the P4 –dialog as shown before. This dialog consists of 4 different parts, and we show here each part in a separate figure:

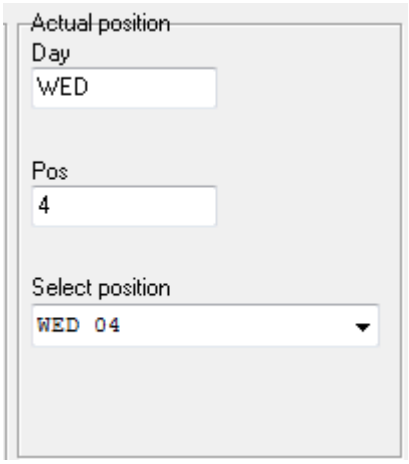
SELECTION OF ACTIVITIES.



This is the upper left corner, and this is of course the most important element in the dialog. Usually this defines one specific activity, but this selector is defined just as for period directives, and in the general case we might refer to any activity set.

Actual position.

Upper right corner.



This is usually the position where we selected an activity, but these fields might also be blanks i.e. in the case we have selected some activity in UtsGrid. **The selected tables we produce will contain colour codes and the interpretation of these is very different depending on whether actual position is empty or filled in.**

In the current case we have selected 9B in position WED 4 and the dialog above is automatically filled in. A drop down list allows you to modify selected period. The interpretation of the colour codes in the two cases are:

Empty actual position.

The colour codes are now telling something of the assignment possibilities for the selector i.e. usually one specific activity. Interpretation of colour codes is then

- **Dark green background black foreground.**
  Tplan sees no problems with using this position for selected activity.
- **Light green background black foreground.**
  Tplan knows that this position is available for selected activity, but due to various timetabling conditions these positions must be used for other activities
- **Deep red background white foreground.**
  One of the resources of the activity is assigned here, and accordingly the activity is blocked here.
- **Light yellow background black foreground.**
  The activity might be assigned here, but you are then breaking a day conflict i.e. the activity is already assigned on this day.
- **Pink background black foreground.**
  The activity may be assigned here, but you are then ignoring some blockings in period directives.
- **Dark yellow background black foreground.**
  The classes and teachers may be assigned here but there is some room requirement which is not satisfied.
- **Dark red background black foreground.**
  Assignment is possible but you are then breaking a day conflict and some positional directive.
- **Yellow brown background black foreground.**
  Assignment here breaks both a day conflict and some room requirement.
- **Olive background black foreground.**
  Assignment here breaks both some positional directive and some room requirement

Filled in Actual position.

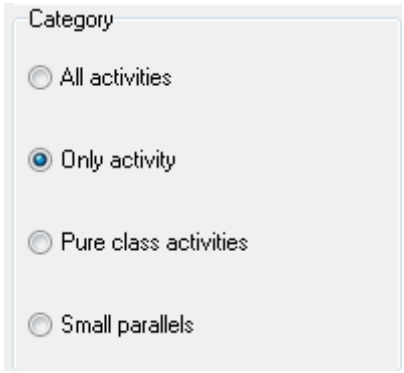
Now the colour codes tell something about the assignment/interchange possibilities of other activities in relation to actual position. The selected activity is possibly already assigned here. If not, we **imagine it being assigned here**, and then we make an interchange of actual position with all other positions in the table. Actual position will very often be an empty cell, and then the interchange process is reduced to move other activities to actual position.

The interpretation of the colour codes is now:

- **Light green background black foreground.**
  This position may be interchanged with or moved to actual position.
- **Light yellow background black foreground.**
  This position may be interchanged with or moved to actual position, but we then break one or more day conflicts.
- **Pink background black foreground.**
  This position may be interchanged with or moved to actual position, but we are then ignoring one or more blockings in positional directives.
- **Deep red background white foreground.**
  This position **cannot** be interchanged with or moved to actual position. Regrettably the most common colour.
- **Dark red background black foreground.**
  This position may be interchanged with or moved to actual position, but you are then breaking both day conflicts and initial blockings.
- **Dark lilac background black foreground.**
  This position may be moved to actual position, but the selected activity **cannot** be moved back to this position.

Both colour techniques are very important in various contexts, and it is important to recognize the different interpretations of colour codes in the two cases.

3. Category.



This element is the bottom right part of the dialog, and defines the kind of selection we are requiring. We have these possibilities:

1. Only activity.
   We create a selection of **timetable columns** consisting only of the resources (classes, teachers, rooms) being included in selected activity. When working **with large blocks in the initial timetabling stages, this is the only natural choice.** Later in the timetabling process when assigning pure class activities, this choice gives you too few columns to get a proper survey of natural moves/interchanges, and we then prefer one of the other categories. This is the only selection which is completely dependent upon selected activity while the other categories depend only upon which class or teacher you select.

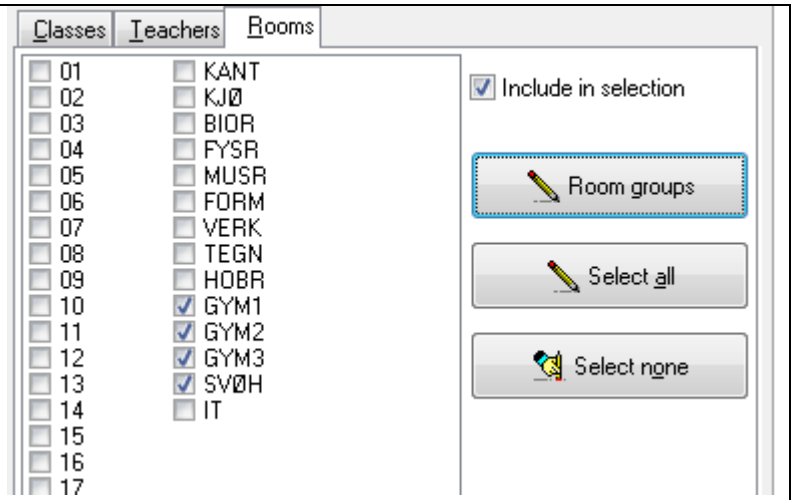
2. All activities.
   We now get a selection for all resources having common activities with selected class (teacher).For most classes this becomes too many resources to get a proper survey. For primary schools with a small number of teachers' pr. class this is a natural survey and is otherwise seldom used.
3. Pure class activities.
   We create a selection consisting of selected class and the teachers having pure class activities in the class (i.e. only one teacher alone in the class).These are the teachers which most likely may be moved or interchanged. Visually you now should have a good survey to assign activities for the class in question. This is very often the most usual category (in particular when working with components).
4. Small parallels.
   Now you get a selection of actual class and classes/teachers connected with the class in simple activities or small parallels i.e. activities consisting maximally of 4 resources. This category usually contains more teachers than the previous category. Still there should be fair chances for moving around the teachers you see onscreen. Teachers only included in larger block for the class (at least 5 resources) have few possibilities for being moved around. They are not included in the selection since they only create confusion in a survey which ought to be as compact as possible.

My strong recommendation is to use the category: Only activity while working with large blocks. As soon as possible we switch to Small parallels. If this selection is too large or if there only is pure class activities remaining, I switch to that latter category.

4. Resources being unconditionally included in selection.

Down left in the dialog there are three tab sheets where we can define which classes, teachers or rooms which is included in the selection regardless of which category you select. More seldom used facility but in some cases a very **important** facility. The most typical example is the following:

We have assigned all large blocks and start assigning smaller activities which requires heavily used specialist rooms (P. E or Crafts might be a typical example).



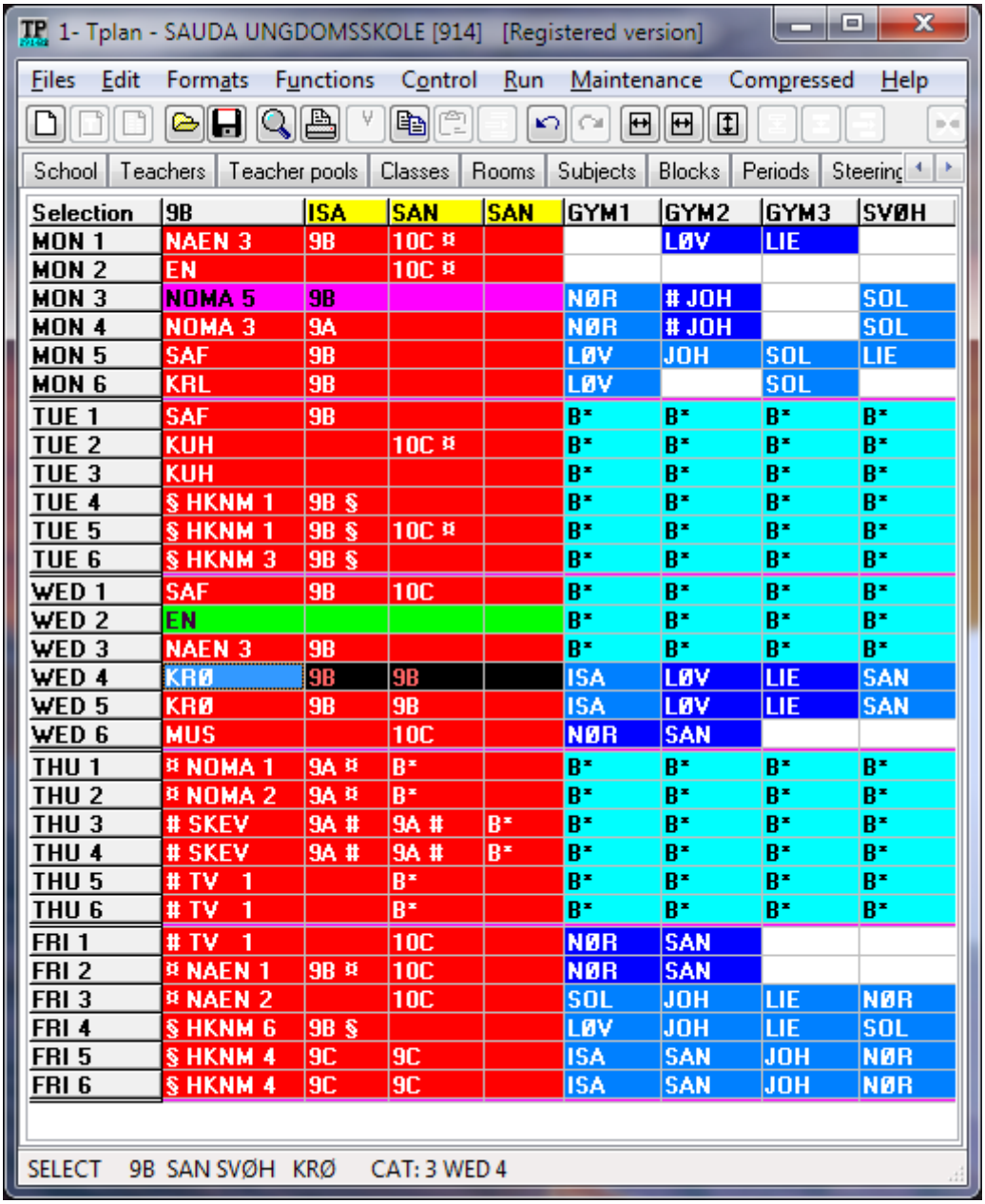
In this case it is very useful to get a survey of the gymnastic rooms and craft rooms regardless of selected category to investigate possibilities for moves/interchanges in these rooms. Another example for using this technique is if several classes are cross linked in a multitude of ways and having a dominant influence upon the whole timetable and ought to be watched at all times. Same is the case if teachers are teaching in several heavily used specialist rooms (example: P.E., Cooking and Crafts). Watch those combined teachers.

This part of the dialog has been given some useful extensions:

- You might require set of room groups to be included in a selection unconditionally

- Even if you are not working with Teacher Pools you could fill in this table to be able to refer to set of teachers being problematic when adjusting your kickouts.

By clicking OK in the P4 – dialog filled out as shown above, we get the following colour selection (KtempGrid):



Selection	9B	ISA	SAN	SAN	GYM1	GYM2	GYM3	SVØH
MON 1	NAEN 3	9B	10C ¤			LØV	LIE	
MON 2	EN		10C ¤					
MON 3	NOMA 5	9B			NØR	# JOH		SOL
MON 4	NOMA 3	9A			NØR	# JOH		SOL
MON 5	SAF	9B			LØV	JOH	SOL	LIE
MON 6	KRL	9B			LØV		SOL	
TUE 1	SAF	9B			B*	B*	B*	B*
TUE 2	KUH		10C ¤		B*	B*	B*	B*
TUE 3	KUH				B*	B*	B*	B*
TUE 4	§ HKNM 1	9B §			B*	B*	B*	B*
TUE 5	§ HKNM 1	9B §	10C ¤		B*	B*	B*	B*
TUE 6	§ HKNM 3	9B §			B*	B*	B*	B*
WED 1	SAF	9B	10C		B*	B*	B*	B*
WED 2	EN				B*	B*	B*	B*
WED 3	NAEN 3	9B			B*	B*	B*	B*
WED 4	KRØ	9B	9B		ISA	LØV	LIE	SAN
WED 5	KRØ	9B	9B		ISA	LØV	LIE	SAN
WED 6	MUS		10C		NØR	SAN		
THU 1	¤ NOMA 1	9A ¤	B*		B*	B*	B*	B*
THU 2	¤ NOMA 2	9A ¤	B*		B*	B*	B*	B*
THU 3	# SKEV	9A #	9A #	B*	B*	B*	B*	B*
THU 4	# SKEV	9A #	9A #	B*	B*	B*	B*	B*
THU 5	# TV 1		B*		B*	B*	B*	B*
THU 6	# TV 1		B*		B*	B*	B*	B*
FRI 1	# TV 1		10C		NØR	SAN		
FRI 2	¤ NAEN 1	9B ¤	10C		NØR	SAN		
FRI 3	¤ NAEN 2		10C		SOL	JOH	LIE	NØR
FRI 4	§ HKNM 6	9B §			LØV	JOH	LIE	SOL
FRI 5	§ HKNM 4	9C	9C		ISA	SAN	JOH	NØR
FRI 6	§ HKNM 4	9C	9C		ISA	SAN	JOH	NØR

Notice in this screen the following:

- All our PE- rooms (GYM1 etc.) are included in the selection unconditionally.
- All specials symbols (B* etc.) are included in the selection.
- Most periods in table are red i.e. impossible to use for an interchange. WED 2 seems to be acceptable and MON 3 may possibly be used by making other compromises.
- By checking further you see that the use of WED 2 is a complete illusion since all PE- rooms are blocked here. The correct interpretation of the green colour here is: **You may interchange these two periods if you only consider classes and teachers but not rooms. In some cases (not here) this could be an acceptable compromise.** By checking MON 3 further you find the situation here is even worse since an interchange destroys presassignment of large blocks.

- This is more or less a ridiculous example showing it is almost hopeless to move 9B KRØ from WED 2. **The point of this exercise was to show how to create a selection, to show that the colour must be red with some reservation and to STRESS the fact the ALMOST all adjustment of kickouts should be handled in KtempGrid**

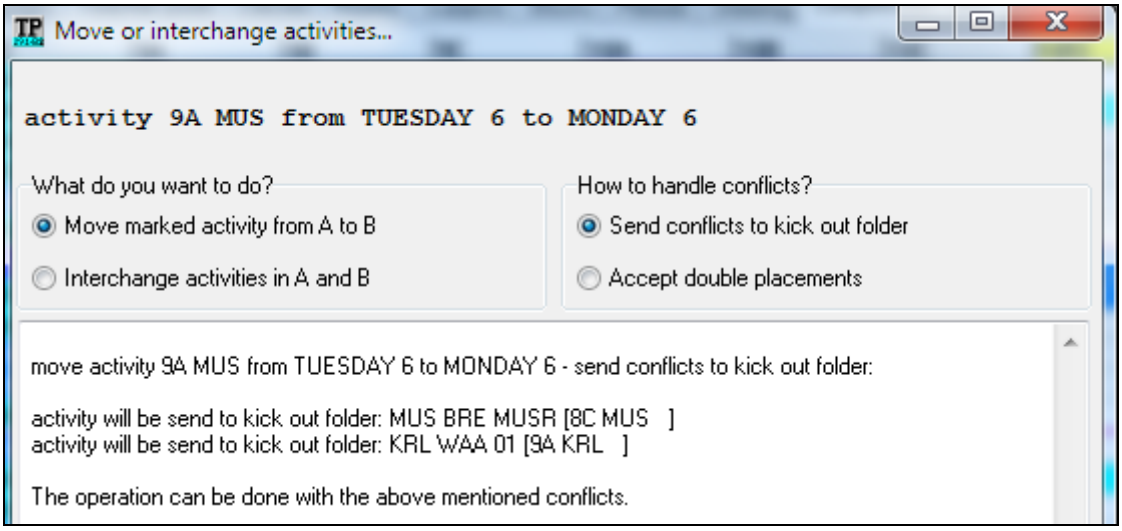
6.2.2 P2: Move/Interchange an activity (table unit)

(Earlier button for P2- operation, currently not in Tplan but might later be restored) 

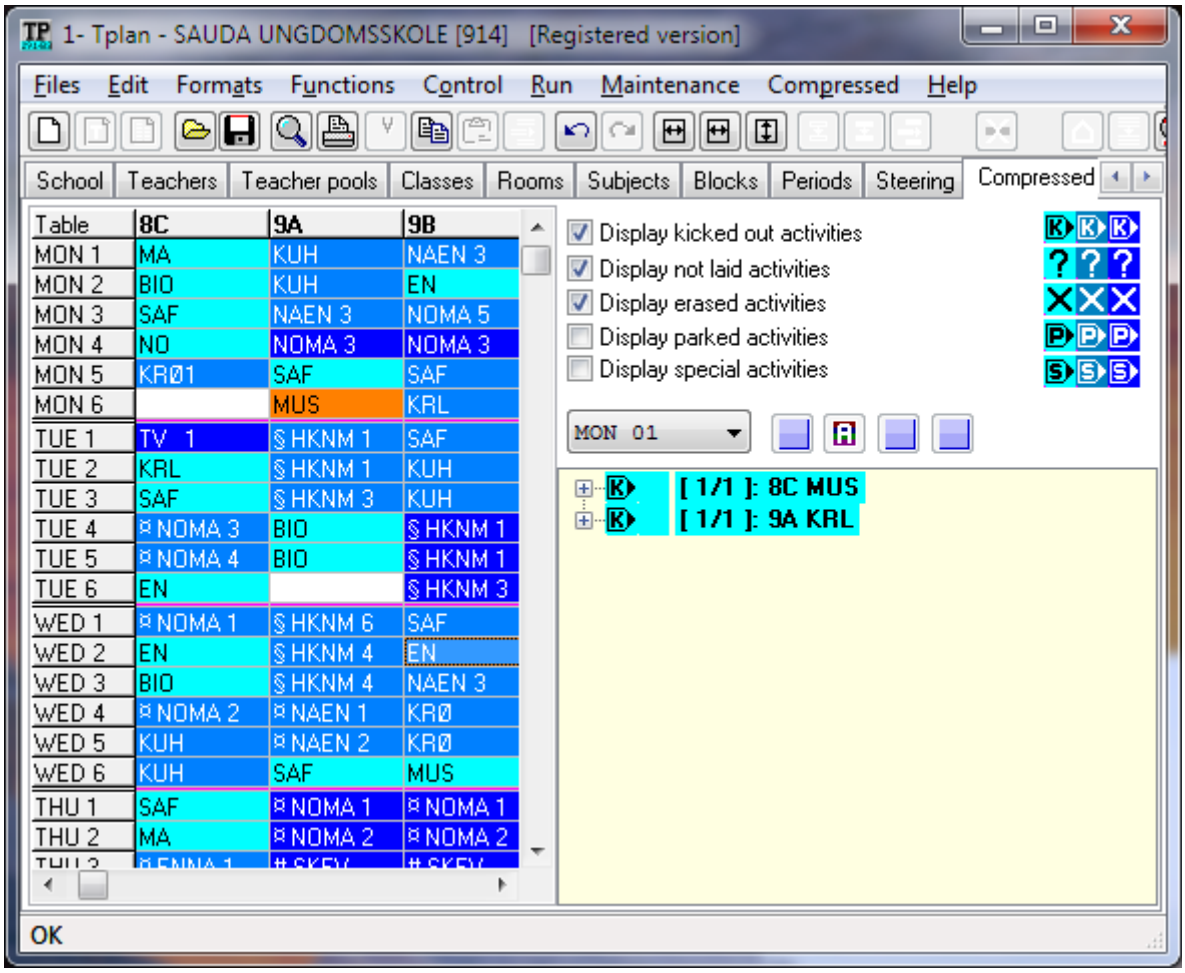
P2 is a VERTICAL drag/drop- operation WITHIN a timetable grid. We drag an activity from period A and drop it in period B. Such a drag/drop may perform two different operations:

- MOVEMENT from A to B: An activity is dragged from A and dropped in B. In case this result in conflicts, there is a further choice to be made. We may EITHER accept these conflicts OR we may transfer conflicting activities to the kickout list.
- INTERCHANGE A with B: An activity is dragged from A and dropped in B. All conflicting activities are then moved from B and dropped in A. That might lead to a further choice from the user: We may EITHER accept new conflicts in period A OR we may transfer conflicting activities to the kickout list.
- To sum this up: A vertical drag/drop in a class/teacher-column (NB not rooms) may perform two different actions: MOVEMENT or INTERCHANGE. In each case there is a choice to be made about accepting new conflicts. Depending on the user's action a P2- operation might give 4 different results.

We will show P2 in the table fig 6.1. Assume that we for some reason want to move/interchange 9A MUS in TUE 6 (i.e. period A) with MON 6 (i.e. period B). We give no timetabling reasons for that action. We just want to show the mechanics (i.e. what could happen). We do this drag/drop and the following dialog pops up:

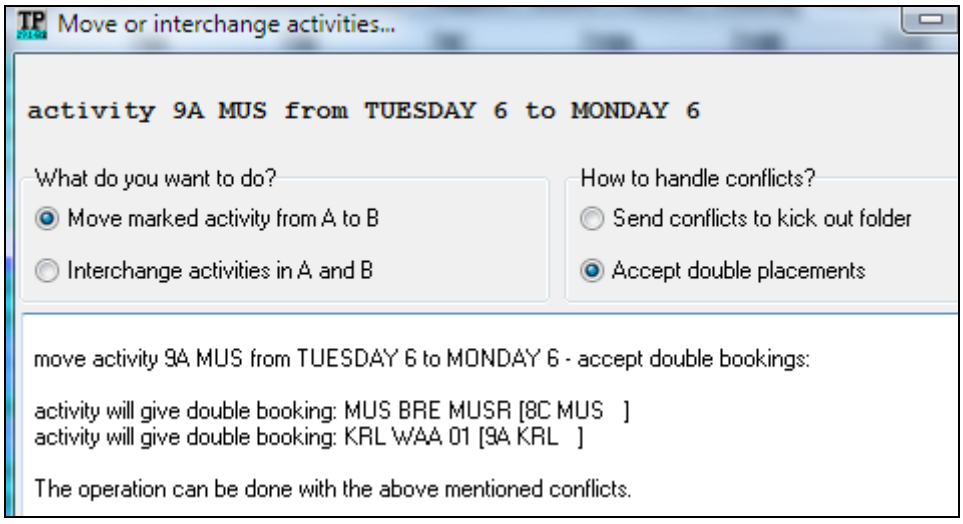


The heading shows what we are trying to do, followed with what would happen. This is the case where we move 9A MUS fro TUE 6 to MON 6 and then transfers conflicting activities to the kickout list. Assume we accept that and we end up with this result:



9A MUS has been **MOVED** from TUE 6 to MON 6 and the two conflicting activities in MON 6 are transferred to the Kickout List.

Assume we would accept these 2conflicts. We get this message:



We accept this and get the following table:

Table	8C	9A	9B	9C	10A	10B	10C	R+D	AUS	BIR	BRE
MON 1	MA	KUH	NAEN 3	§ HKNM 4	KR+	KR+	¤ NOMA 1		8B	10C ¤	
MON 2	BIO	KUH	EN	§ HKNM 4	NO 1	NO	¤ NOMA 2	9B	8B ¤	10C ¤	
MON 3	SAF	NAEN 3	NOMA 5	§ HKNM 6	# SKEV	# SKEV	# SKEV		8B ¤		
MON 4	NO	NOMA 3	NOMA 3	NAEN 3	# SKEV	# SKEV	# SKEV				
MON 5	KR+1	SAF	SAF	SAF	# TV 1	# TV 1	# TV 1		10A #	9B	
MON 6	MUS	*DPL	KRL	KRL	# TV 1	# TV 1	# TV 1		10A #	9B	*DPL
TUE 1	TV 1	§ HKNM 1	SAF	¤ NOMA 1	NAT	¤ ENNA 1	EN	10B ¤	10C	9B	
TUE 2	KRL	§ HKNM 1	KUH	¤ NOMA 2	NO 1	¤ ENNA 2	¤ NOMA 3	10B ¤		10C ¤	
TUE 3	SAF	§ HKNM 3	KUH	MUS	KRL	SAF	NAT			10B	9C
TUE 4	¤ NOMA 3	BIO	§ HKNM 1	KUH	NOMA 5	¤ NOMA 2	SAF		8B	10C	
TUE 5	¤ NOMA 4	BIO	§ HKNM 1	KUH	SAF 3	¤ NOMA 1	¤ NOMA 4		8B	10C ¤	
TUE 6	EN		§ HKNM 3	BIO	# TV 1	# TV 1	# TV 1		10A #	8A	
WED 1	¤ NOMA 1	§ HKNM 6	SAF	SAF	¤ ENNA 2	KOH	MA		10A ¤	9B	
WED 2	EN	§ HKNM 4	EN	BIO	¤ ENNA 1	KOH	NO	9B	10A ¤	10C	
WED 3	BIO	§ HKNM 4	NAEN 3	NAEN 3	¤ NOMA 1	NO	KOH				
WED 4	¤ NOMA 2	¤ NAEN 1	KR+	§ HKNM 1	KR+	KR+	KOH				8B
WED 5	KUH	¤ NAEN 2	KR+	§ HKNM 1	KR+	KR+	SAF		8B	10C	
WED 6	KUH	SAF	MUS	§ HKNM 3	¤ NOMA 2	MA	KR+		8B		9B

Notice here the symbol *DBL in MON 6 for both 9A teacher BRE. That notation conventionally means that there is a double assignment in this cell. By clicking F5 we can “blow up” the table and get the complete picture as shown in next table:

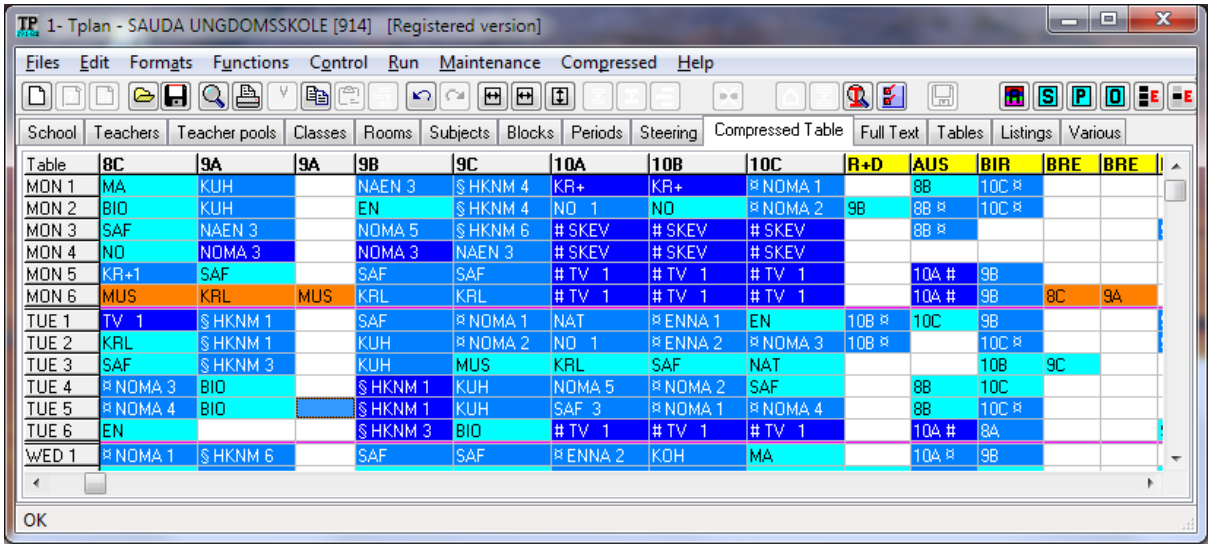
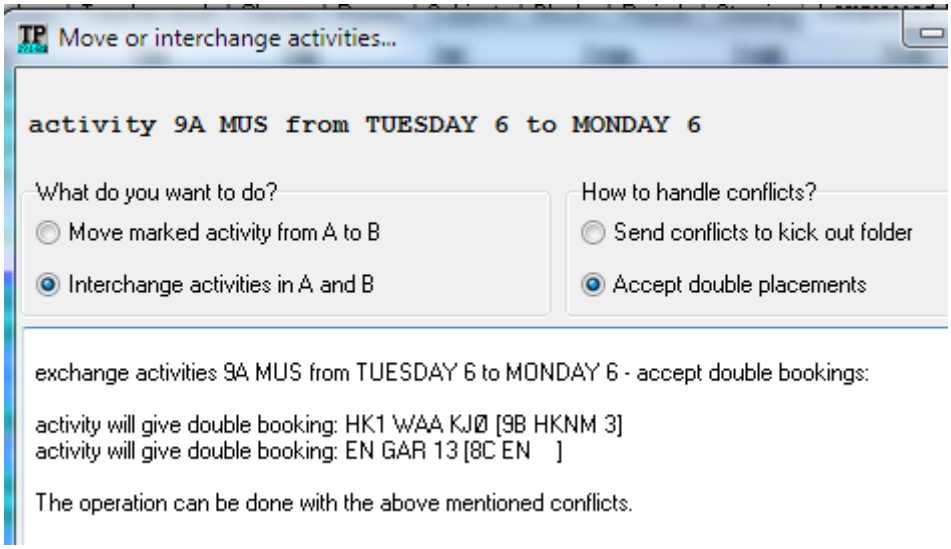


Table	8C	9A	9A	9B	9C	10A	10B	10C	R+D	AUS	BIR	BRE	BRE
MON 1	MA	KUH		NAEN 3	§ HKNM 4	KR+	KR+	¤ NOMA 1		8B	10C ¤		
MON 2	BIO	KUH		EN	§ HKNM 4	NO 1	NO	¤ NOMA 2	9B	8B ¤	10C ¤		
MON 3	SAF	NAEN 3		NOMA 5	§ HKNM 6	# SKEV	# SKEV	# SKEV		8B ¤			
MON 4	NO	NOMA 3		NOMA 3	NAEN 3	# SKEV	# SKEV	# SKEV					
MON 5	KR+1	SAF		SAF	SAF	# TV 1	# TV 1	# TV 1		10A #	9B		
MON 6	MUS	KRL	MUS	KRL	KRL	# TV 1	# TV 1	# TV 1		10A #	9B	8C	9A
TUE 1	TV 1	§ HKNM 1		SAF	¤ NOMA 1	NAT	¤ ENNA 1	EN	10B ¤	10C	9B		
TUE 2	KRL	§ HKNM 1		KUH	¤ NOMA 2	NO 1	¤ ENNA 2	¤ NOMA 3	10B ¤		10C ¤		
TUE 3	SAF	§ HKNM 3		KUH	MUS	KRL	SAF	NAT			10B	9C	
TUE 4	¤ NOMA 3	BIO		§ HKNM 1	KUH	NOMA 5	¤ NOMA 2	SAF		8B	10C		
TUE 5	¤ NOMA 4	BIO		§ HKNM 1	KUH	SAF 3	¤ NOMA 1	¤ NOMA 4		8B	10C ¤		
TUE 6	EN			§ HKNM 3	BIO	# TV 1	# TV 1	# TV 1		10A #	8A		
WED 1	¤ NOMA 1	§ HKNM 6		SAF	SAF	¤ ENNA 2	KOH	MA		10A ¤	9B		

The reason for doing this in two steps is two folded: The first table is most compressed and perhaps enough. The second table is more complete but the blowing up process may take a little time.

Alternatively we might want to interchange 9A MUS in TUE 6 with 9A KRL and get the following warnings:



Notice that these conflicts are in TUE 6 (i.e. in the period we started the drag i.e. period A). By accepting this we get this: table:

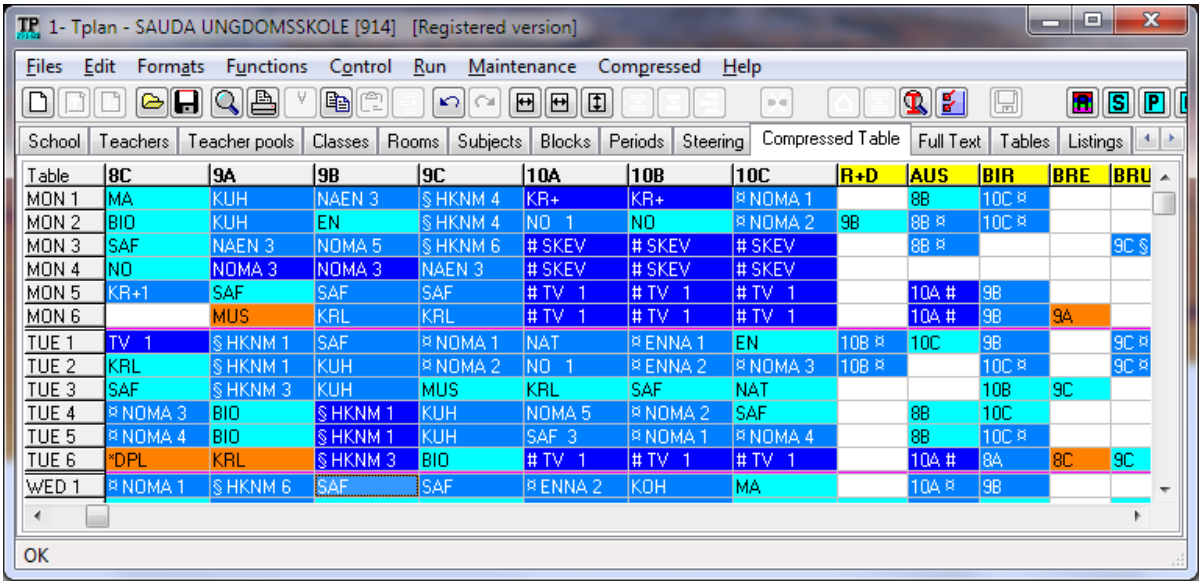


Table	8C	9A	9B	9C	10A	10B	10C	R+D	AUS	BIR	BRE	BRU
MON 1	MA	KUH	NAEN 3	§ HKNM 4	KR+	KR+	¤ NOMA 1		8B	10C ¤		
MON 2	BIO	KUH	EN	§ HKNM 4	NO 1	NO	¤ NOMA 2	9B	8B ¤	10C ¤		
MON 3	SAF	NAEN 3	NOMA 5	§ HKNM 6	# SKEV	# SKEV	# SKEV		8B ¤			9C §
MON 4	NO	NOMA 3	NOMA 3	NAEN 3	# SKEV	# SKEV	# SKEV					
MON 5	KR+1	SAF	SAF	SAF	# TV 1	# TV 1	# TV 1		10A #	9B		
MON 6		MUS	KRL	KRL	# TV 1	# TV 1	# TV 1		10A #	9B	9A	
TUE 1	TV 1	§ HKNM 1	SAF	¤ NOMA 1	NAT	¤ ENNA 1	EN	10B ¤	10C	9B		9C ¤
TUE 2	KRL	§ HKNM 1	KUH	¤ NOMA 2	NO 1	¤ ENNA 2	¤ NOMA 3	10B ¤		10C ¤		9C ¤
TUE 3	SAF	§ HKNM 3	KUH	MUS	KRL	SAF	NAT			10B	9C	
TUE 4	¤ NOMA 3	BIO	§ HKNM 1	KUH	NOMA 5	¤ NOMA 2	SAF		8B	10C		
TUE 5	¤ NOMA 4	BIO	§ HKNM 1	KUH	SAF 3	¤ NOMA 1	¤ NOMA 4		8B	10C ¤		
TUE 6	*DPL	KRL	§ HKNM 3	BIO	# TV 1	# TV 1	# TV 1		10A #	8A	8C	9C
WED 1	¤ NOMA 1	§ HKNM 6	SAF	SAF	¤ ENNA 2	KOH	MA		10A ¤	9B		

The steps here are: 9A MUS is moved to MON 6 and 9A KRL and other conflicting activities are moved back to TUE 6. By blowing up this table (F5) we get:

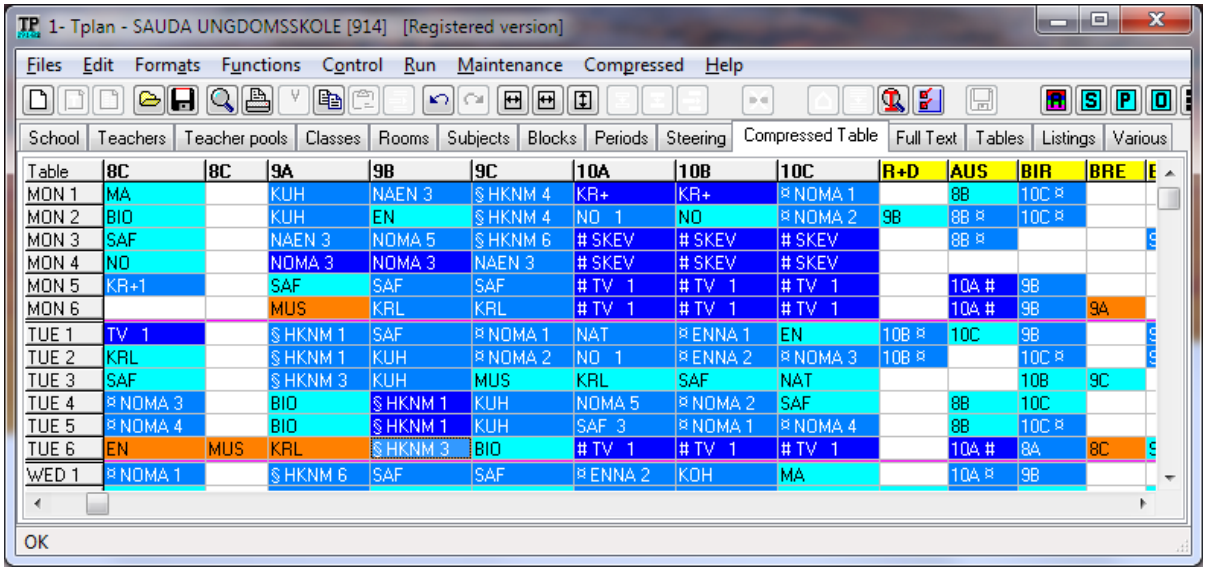
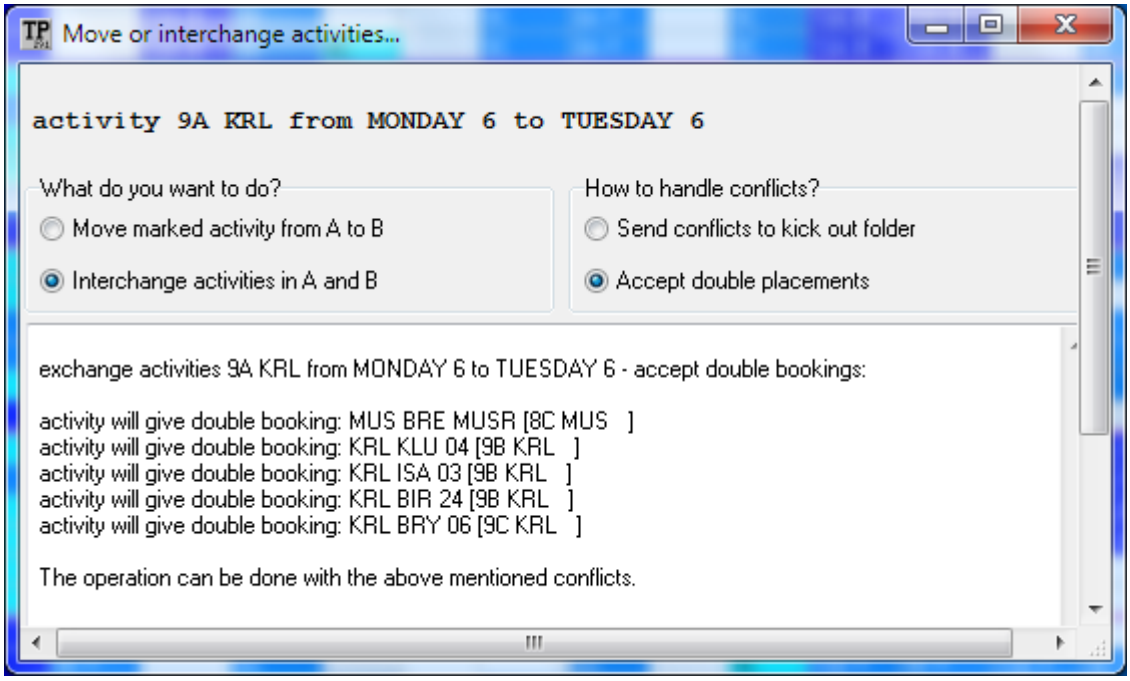


Table	8C	8C	9A	9B	9C	10A	10B	10C	R+D	AUS	BIR	BRE
MON 1	MA		KUH	NAEN 3	§ HKNM 4	KR+	KR+	¤ NOMA 1		8B	10C ¤	
MON 2	BIO		KUH	EN	§ HKNM 4	NO 1	NO	¤ NOMA 2	9B	8B ¤	10C ¤	
MON 3	SAF		NAEN 3	NOMA 5	§ HKNM 6	# SKEV	# SKEV	# SKEV		8B ¤		
MON 4	NO		NOMA 3	NOMA 3	NAEN 3	# SKEV	# SKEV	# SKEV				
MON 5	KR+1		SAF	SAF	SAF	# TV 1	# TV 1	# TV 1		10A #	9B	
MON 6			MUS	KRL	KRL	# TV 1	# TV 1	# TV 1		10A #	9B	9A
TUE 1	TV 1		§ HKNM 1	SAF	¤ NOMA 1	NAT	¤ ENNA 1	EN	10B ¤	10C	9B	
TUE 2	KRL		§ HKNM 1	KUH	¤ NOMA 2	NO 1	¤ ENNA 2	¤ NOMA 3	10B ¤		10C ¤	
TUE 3	SAF		§ HKNM 3	KUH	MUS	KRL	SAF	NAT			10B	9C
TUE 4	¤ NOMA 3		BIO	§ HKNM 1	KUH	NOMA 5	¤ NOMA 2	SAF		8B	10C	
TUE 5	¤ NOMA 4		BIO	§ HKNM 1	KUH	SAF 3	¤ NOMA 1	¤ NOMA 4		8B	10C ¤	
TUE 6	EN	MUS	KRL	§ HKNM 3	BIO	# TV 1	# TV 1	# TV 1		10A #	8A	8C
WED 1	¤ NOMA 1		§ HKNM 6	SAF	SAF	¤ ENNA 2	KOH	MA		10A ¤	9B	

In the above we used TUE 6 as period A and interchanged with MON 6 = period B and accepted double assignments. Doing it the opposite way gives you something different. Assume you want to interchange 9A KRL in MON 6 (= period A) with TUE 6 (= period B) you get this message:

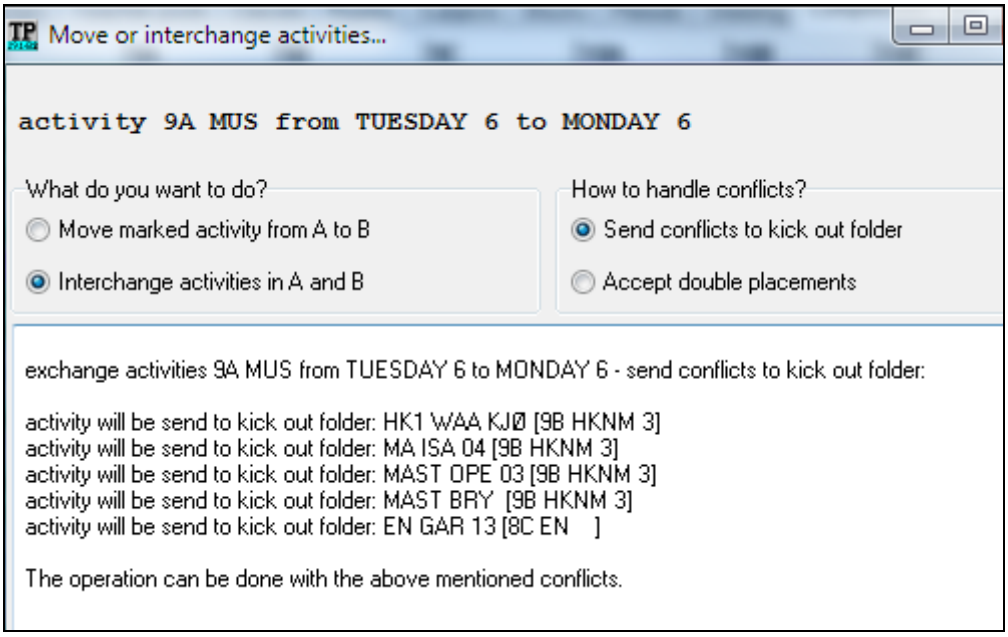


If we accept the above, we get this table:

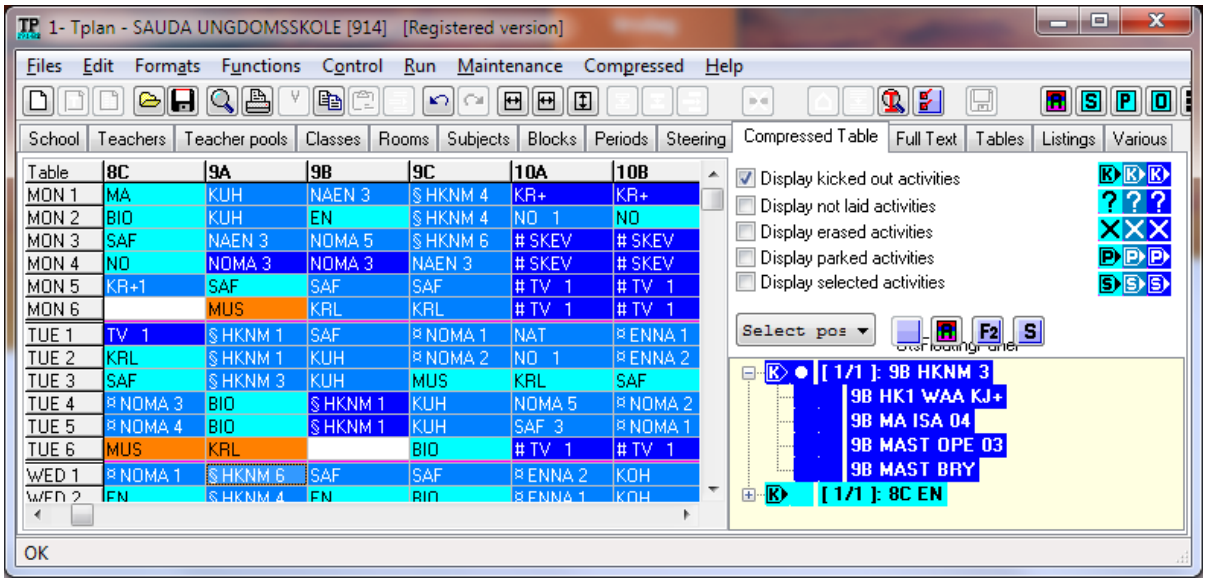
Table	8C	9A	9B	9C	10A	10B	10C	R+D	AUS	BIR	BRE	BRU	BRY
MON 1	MA	KUH	NAEN 3	§ HKNM 4	KR+	KR+	¤ NOMA 1		8B	10C ¤			
MON 2	BIO	KUH	EN	§ HKNM 4	NO 1	NO	¤ NOMA 2	9B	8B ¤	10C ¤			10A
MON 3	SAF	NAEN 3	NOMA 5	§ HKNM 6	# SKEV	# SKEV	# SKEV		8B ¤			9C §	9B
MON 4	NO	NOMA 3	NOMA 3	NAEN 3	# SKEV	# SKEV	# SKEV						9A
MON 5	KR+1	SAF	SAF	SAF	# TV 1	# TV 1	# TV 1		10A #	9B			9C
MON 6	MUS	MUS	*DPL	KRL	# TV 1	# TV 1	# TV 1		10A #	9B	*DPL		*DPL
TUE 1	TV 1	§ HKNM 1	SAF	¤ NOMA 1	NAT	¤ ENNA 1	EN	10B ¤	10C	9B		9C ¤	8A
TUE 2	KRL	§ HKNM 1	KUH	¤ NOMA 2	NO 1	¤ ENNA 2	¤ NOMA 3	10B ¤		10C ¤		9C ¤	10A
TUE 3	SAF	§ HKNM 3	KUH	MUS	KRL	SAF	NAT			10B	9C		
TUE 4	¤ NOMA 3	BIO	§ HKNM 1	KUH	NOMA 5	¤ NOMA 2	SAF		8B	10C			9B §
TUE 5	¤ NOMA 4	BIO	§ HKNM 1	KUH	SAF 3	¤ NOMA 1	¤ NOMA 4		8B	10C ¤			9B §
TUE 6	EN	KRL		BIO	# TV 1	# TV 1	# TV 1		10A #	8A		9C	

This is very different from the previous table. The lesson here is: If you want to want to interchange something in period A with something in period B, it is some cases important what you call period A (I.e. where we start the drag)

The last possibility when dragging 9A MUS from TUE 6 to MON 6, gives you this message:



In this case you want to interchange TUE 6 with MON 6, and sending conflicting activities to the Kickout list this table is the result:



My **carefully selected** example is plain rubbish from a timetabling point of view. However, a more sensible timetabling example would not show all possible warnings that might happen, and this is the main point of my example. To sum this up **once more**:

A vertical drag/drop in a table from period A to period B is called a P2- operation. It might either perform a MOVEMENT of an activity or an INTERCHANGE of an activity with another activity. In both cases you have a choice of either accepting conflicts resulting from that or transfer conflicting activities to the Kickout list. A dialog shows you the results of the 4 different choices you can make. (In simpler cases with no conflicts you can just click on OK and proceed). In some cases it might matter what you call period A (i.e. start of drag) and period B.

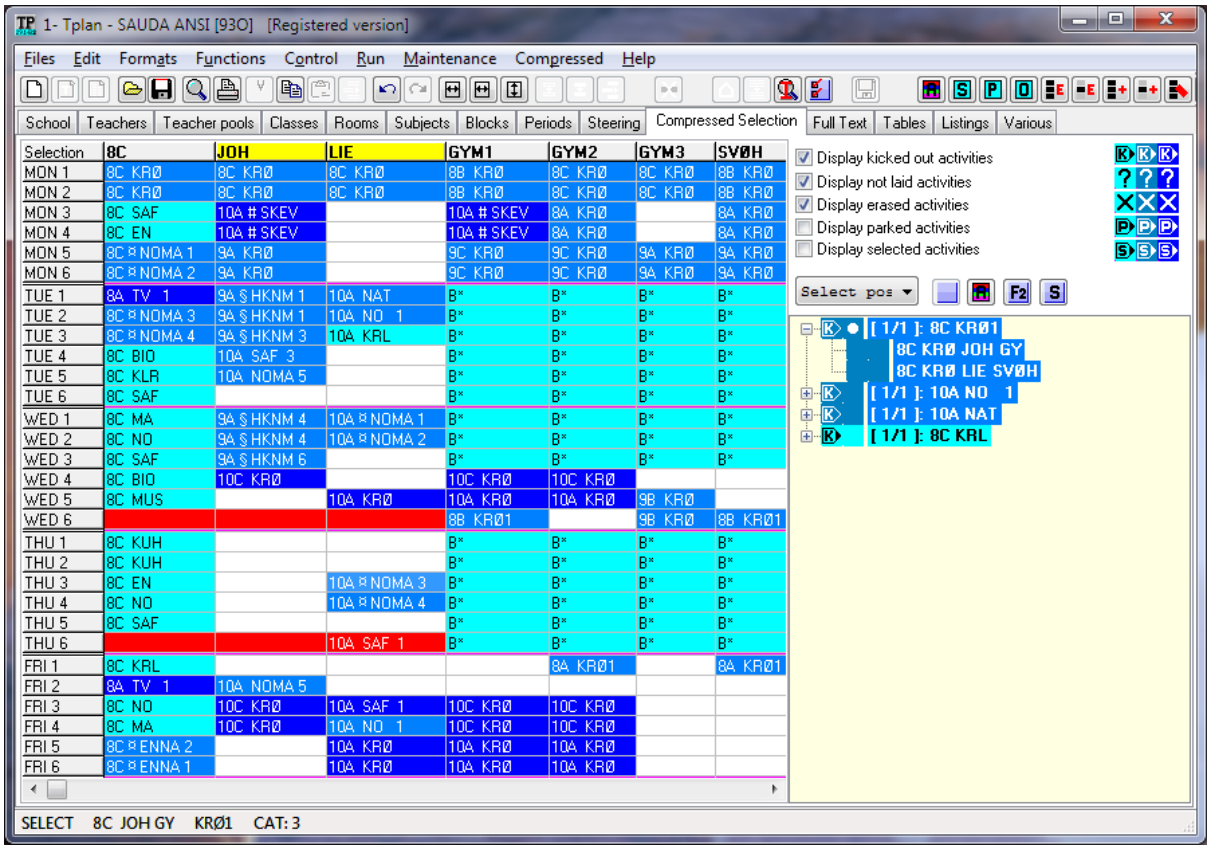
6.2.3 P1: Move an Activity (Table unit) FROM Kickout list to Timetable

(The older P1- button, still used in the heading in the heading in the Kickout list, but a drag/drop is much simpler)

Perhaps the most frequent drag/drop operation: You drag an Activity (Table Unit) FROM the Kickout list and drop it in a cell in a timetable grid. This is lateral (or horizontal) drag/drop is most usually done in a class table but might also be done in a teacher table but NOT room table A P1-operation has fewer choices than a P2:

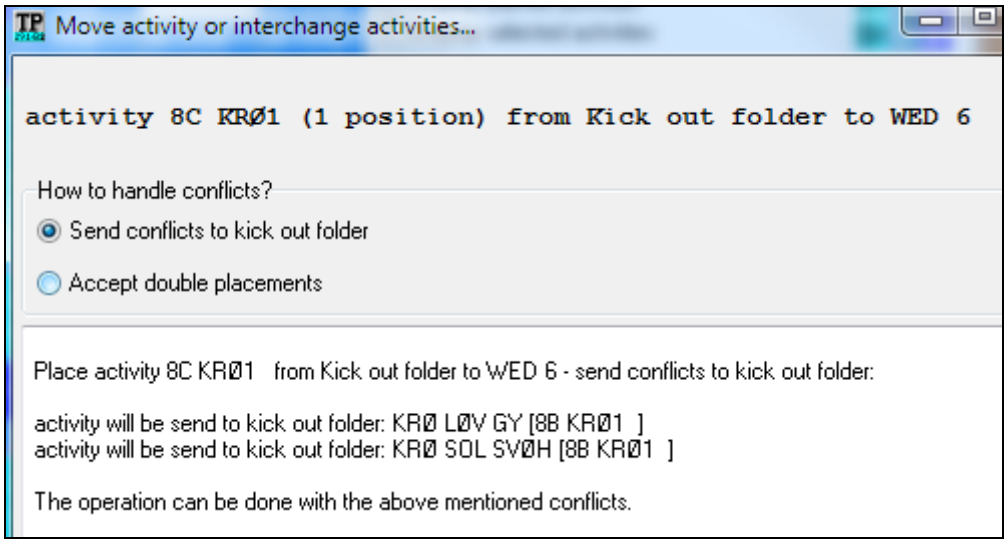
- **In case the P1-operation gives conflicts then we might transfer conflicting activities to the Kickout list.**
- **We might accept the double assignments from the P1- operation (in the same way as we did for a P2- operation.)**

Assume we have this selection from an earlier timetable run:

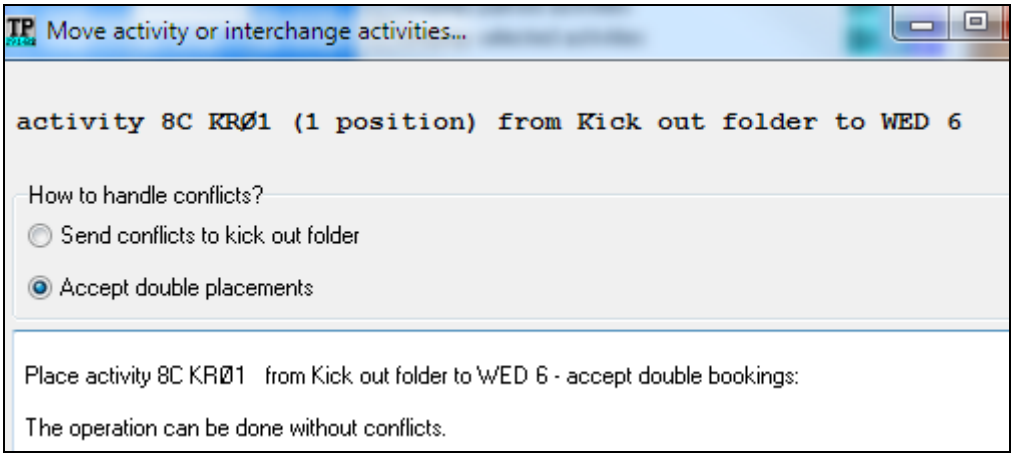


Selection	8C	JOH	LIE	GYM1	GYM2	GYM3	SVØH
MON 1	8C KRØ	8C KRØ	8C KRØ	8B KRØ	8C KRØ	8C KRØ	8B KRØ
MON 2	8C KRØ	8C KRØ	8C KRØ	8B KRØ	8C KRØ	8C KRØ	8B KRØ
MON 3	8C SAF	10A # SKEV		10A # SKEV	8A KRØ		8A KRØ
MON 4	8C EN	10A # SKEV		10A # SKEV	8A KRØ		8A KRØ
MON 5	8C ¤ NOMA 1	9A KRØ		9C KRØ	9C KRØ	9A KRØ	9A KRØ
MON 6	8C ¤ NOMA 2	9A KRØ		9C KRØ	9C KRØ	9A KRØ	9A KRØ
TUE 1	8A TV 1	9A § HKNM 1	10A NAT	B*	B*	B*	B*
TUE 2	8C ¤ NOMA 3	9A § HKNM 1	10A NO 1	B*	B*	B*	B*
TUE 3	8C ¤ NOMA 4	9A § HKNM 3	10A KRL	B*	B*	B*	B*
TUE 4	8C BIO	10A SAF 3		B*	B*	B*	B*
TUE 5	8C KLR	10A NOMA 5		B*	B*	B*	B*
TUE 6	8C SAF			B*	B*	B*	B*
WED 1	8C MA	9A § HKNM 4	10A ¤ NOMA 1	B*	B*	B*	B*
WED 2	8C NO	9A § HKNM 4	10A ¤ NOMA 2	B*	B*	B*	B*
WED 3	8C SAF	9A § HKNM 6		B*	B*	B*	B*
WED 4	8C BIO	10C KRØ		10C KRØ	10C KRØ		
WED 5	8C MUS		10A KRØ	10A KRØ	10A KRØ	9B KRØ	
WED 6				8B KRØ1		9B KRØ	8B KRØ1
THU 1	8C KUH			B*	B*	B*	B*
THU 2	8C KUH			B*	B*	B*	B*
THU 3	8C EN		10A ¤ NOMA 3	B*	B*	B*	B*
THU 4	8C NO		10A ¤ NOMA 4	B*	B*	B*	B*
THU 5	8C SAF			B*	B*	B*	B*
THU 6			10A SAF 1	B*	B*	B*	B*
FRI 1	8C KRL				8A KRØ1		8A KRØ1
FRI 2	8A TV 1	10A NOMA 5					
FRI 3	8C NO	10C KRØ	10A SAF 1	10C KRØ	10C KRØ		
FRI 4	8C MA	10C KRØ	10A NO 1	10C KRØ	10C KRØ		
FRI 5	8C ¤ ENNA 2		10A KRØ	10A KRØ	10A KRØ		
FRI 6	8C ¤ ENNA 1		10A KRØ	10A KRØ	10A KRØ		

This table is created in the following way: We have a kickout of a block activity 8C KRØ1 (P.E.). We use as Category: Only activity and included in the selection all rooms which 8C KRØ1 could use and the above table is the result. When inspecting the room there seems to be little hope here due to all room blockings. (The school shares PE- rooms with another school.) There are two red periods here (i.e. being blocked for 8C KRØ1), WED 6 and THU 6. The latter looks in particular little promising, but we make a try with WED 6. The result is the following dialog:



Here we get the information why WED 6 is red: Both 8B KRØ1 and 8C KRØ1 are requiring the same room: SVØH. Assume we accept that conflict and we get this dialog:



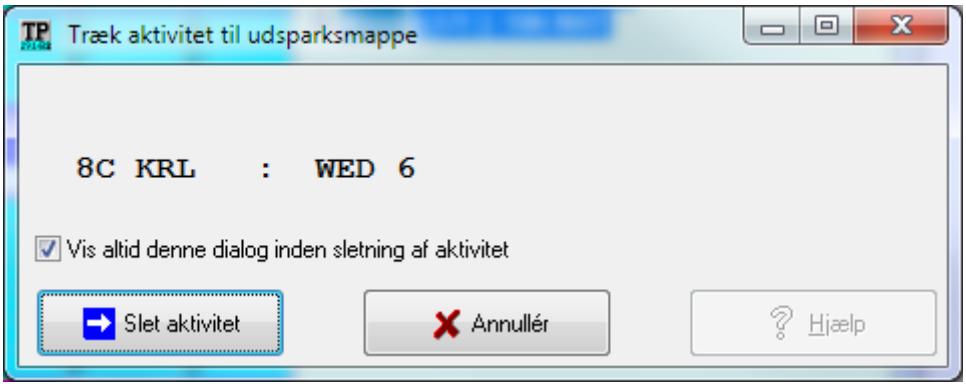
Surprise, surprise!! Now Tplan is telling us that this P1- operation may be done without conflicts while it is quite obvious that we are lacking a room in WED 6. The correct interpretation of the message above is: There are no conflicts with the intended P1- operation with respect to classes and teachers while room conflicts are ignored. In many cases rooms may be changed in another way and the above info is useful even if it not 100 % correct. (In real life I guess that the school would go along with this compromise.)

We showed a few simpler P1- operations in our introduction and further explanation should not be needed.

6.2.4 P0: Move an Activity (Table unit) FROM Class Timetable to Kickout list

P0 is exactly the reverse of P1 operation but works only in a Class Table (for lateral drags in teacher/room see next paragraph).

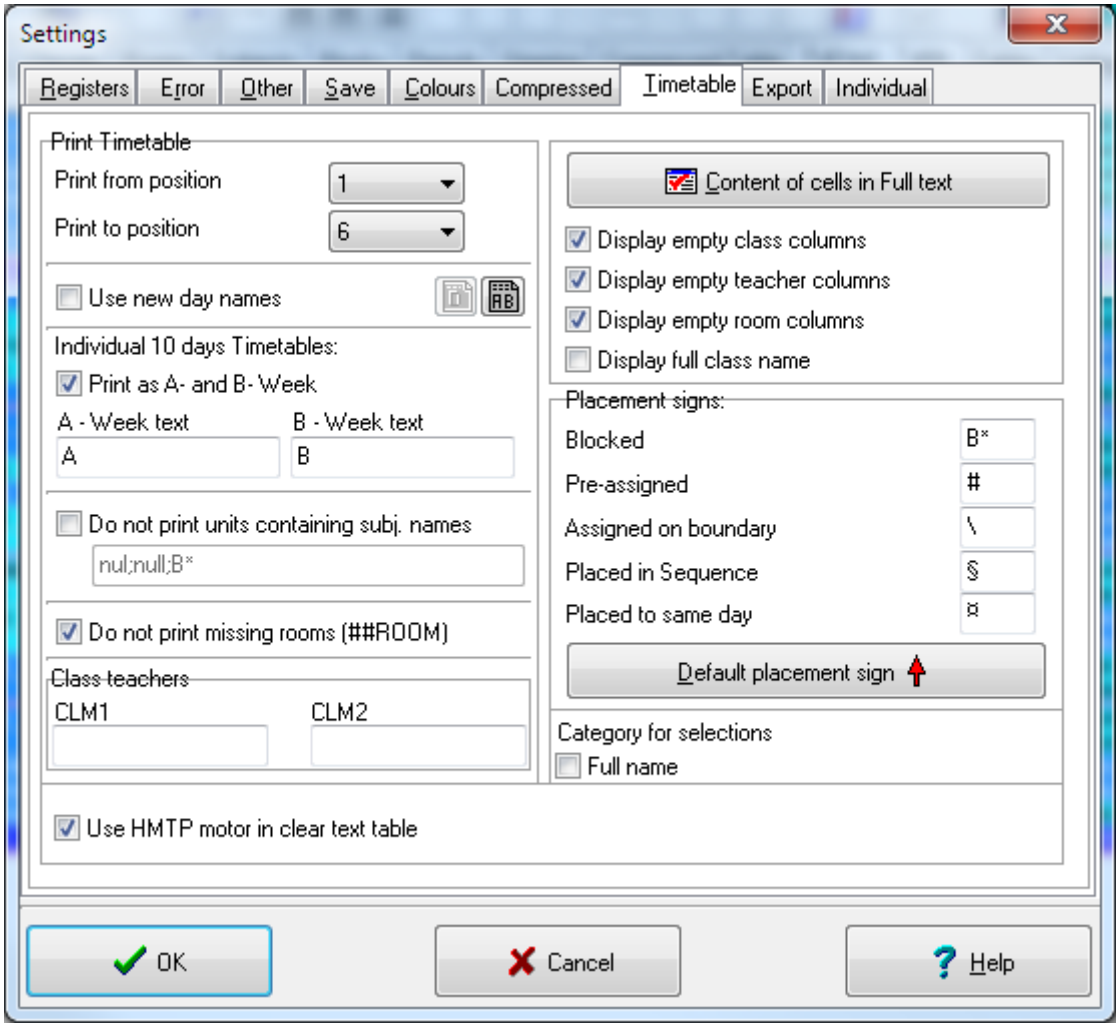
A lateral drag of a class cell transfers that activity (table unit) from timetable to kickout list. This operation will never give new conflicts but you get this warning to confirm the transfer:



You might say that the above dialog is unnecessary since you never get new conflicts. However, it very easily happens that you do a lateral drag of a class cell inadvertently and the above dialog gives you the chance to regret that.

An identical way of transferring an activity to the Kickout list is to click: Ctrl + Del on a cell and this table unit are transferred to the kickout list. This operation works ALSO for a teacher or room cell.

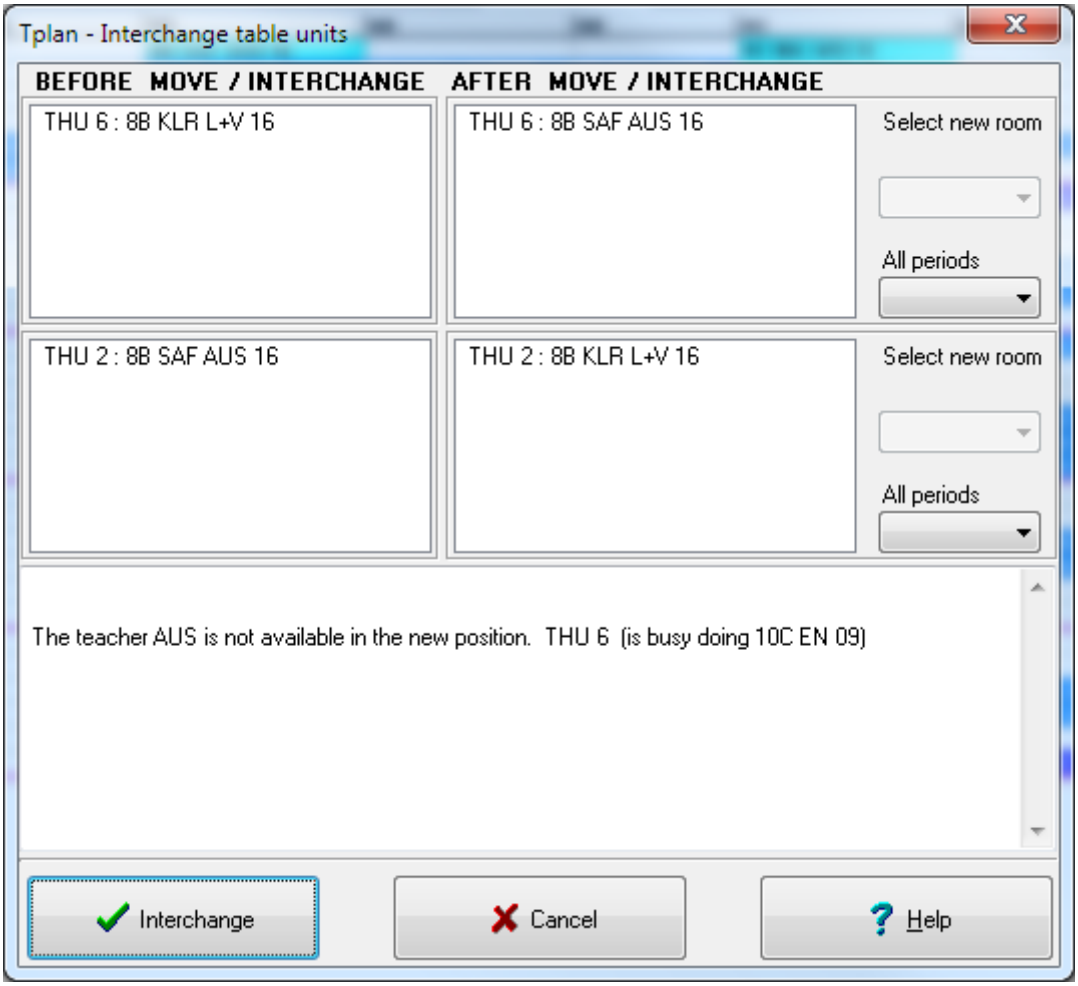
I very seldom do it, but the same drop technique may be used for Full Text Grid: Go to Functions> Settings > Timetable. You get this dialog:



Down at the bottom you see:

Use HMTP motor in clear text table.

By checking this option P1, P2 and P4 will behave as explained for KomprGrid. I have not tested all possibilities here and don't believe that this will be used much. If you uncheck this option, you are back to old interchange rules in Full Text Grid, like this:



This technique was earlier very useful and explained in current user manual, but I regard the new drag/drop technique as considerable better.

6.2.5 P6: Teacher and Room changes or interchanges.

In the previous paragraph we stated that a lateral drag of a class cell transferred that activity to the kickout list. **However, a lateral drag of a teacher or room cell means a CHANGE or INTERCHANGE of this teacher or room.** Assume we have a teacher table like this:

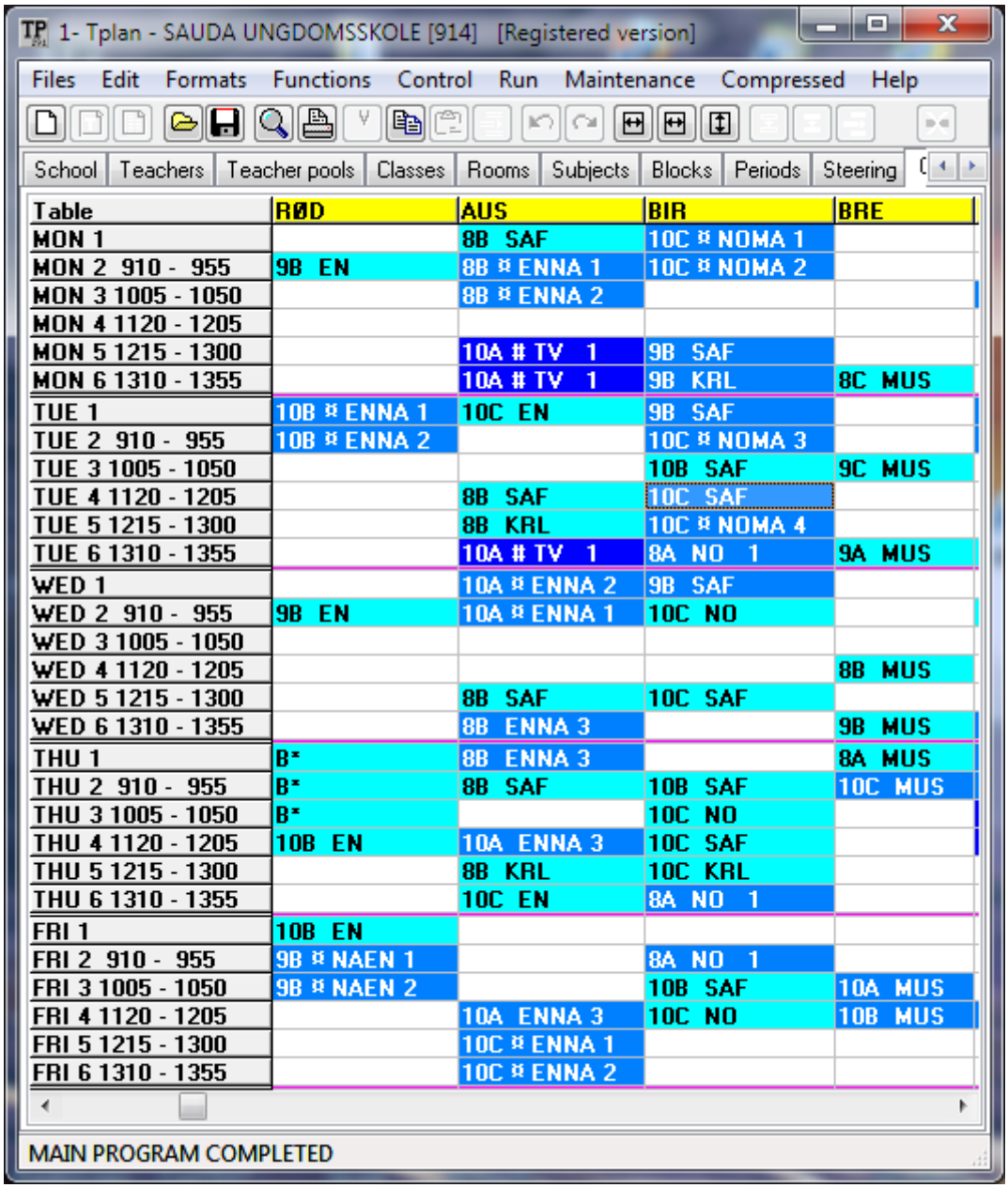


Table	RØD	AUS	BIR	BRE
MON 1		8B SAF	10C ¤ NOMA 1	
MON 2 910 - 955	9B EN	8B ¤ ENNA 1	10C ¤ NOMA 2	
MON 3 1005 - 1050		8B ¤ ENNA 2		
MON 4 1120 - 1205				
MON 5 1215 - 1300		10A # TV 1	9B SAF	
MON 6 1310 - 1355		10A # TV 1	9B KRL	8C MUS
TUE 1	10B ¤ ENNA 1	10C EN	9B SAF	
TUE 2 910 - 955	10B ¤ ENNA 2		10C ¤ NOMA 3	
TUE 3 1005 - 1050			10B SAF	9C MUS
TUE 4 1120 - 1205		8B SAF	10C SAF	
TUE 5 1215 - 1300		8B KRL	10C ¤ NOMA 4	
TUE 6 1310 - 1355		10A # TV 1	8A NO 1	9A MUS
WED 1		10A ¤ ENNA 2	9B SAF	
WED 2 910 - 955	9B EN	10A ¤ ENNA 1	10C NO	
WED 3 1005 - 1050				
WED 4 1120 - 1205				8B MUS
WED 5 1215 - 1300		8B SAF	10C SAF	
WED 6 1310 - 1355		8B ENNA 3		9B MUS
THU 1	B*	8B ENNA 3		8A MUS
THU 2 910 - 955	B*	8B SAF	10B SAF	10C MUS
THU 3 1005 - 1050	B*		10C NO	
THU 4 1120 - 1205	10B EN	10A ENNA 3	10C SAF	
THU 5 1215 - 1300		8B KRL	10C KRL	
THU 6 1310 - 1355		10C EN	8A NO 1	
FRI 1	10B EN			
FRI 2 910 - 955	9B ¤ NAEN 1		8A NO 1	
FRI 3 1005 - 1050	9B ¤ NAEN 2		10B SAF	10A MUS
FRI 4 1120 - 1205		10A ENNA 3	10C NO	10B MUS
FRI 5 1215 - 1300		10C ¤ ENNA 1		
FRI 6 1310 - 1355		10C ¤ ENNA 2		

For some reason the subject 8B SAF (4 periods) must change teacher from AUS to BRE. In return teacher AUS gets 4 periods in subject MUS. After a set of lateral drag/drops you get this situation:

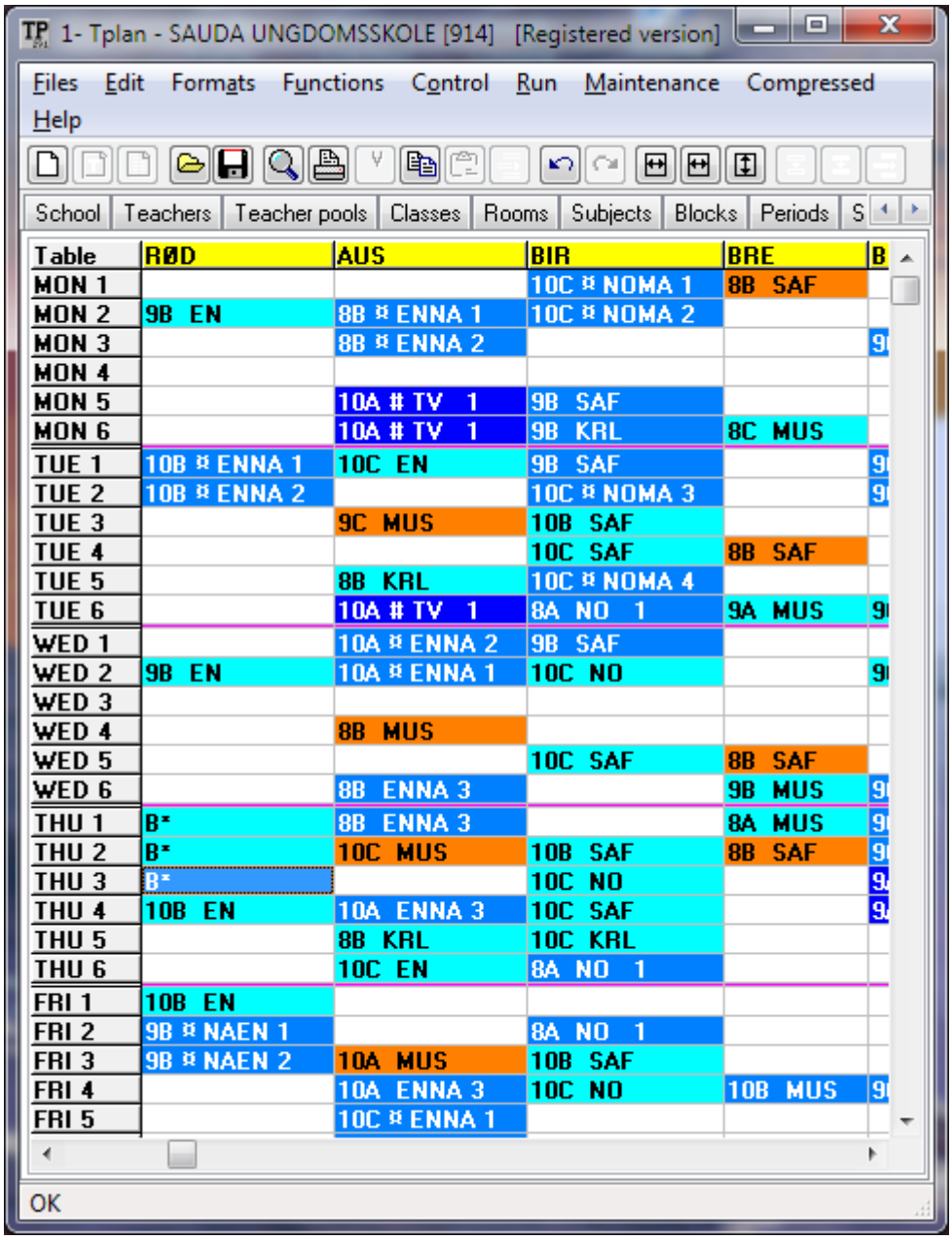


Table	RØD	AUS	BIR	BRE	B
MON 1			10C ¤ NOMA 1	8B SAF	
MON 2	9B EN	8B ¤ ENNA 1	10C ¤ NOMA 2		
MON 3		8B ¤ ENNA 2			9
MON 4					
MON 5		10A # TV 1	9B SAF		
MON 6		10A # TV 1	9B KRL	8C MUS	
TUE 1	10B ¤ ENNA 1	10C EN	9B SAF		9
TUE 2	10B ¤ ENNA 2		10C ¤ NOMA 3		9
TUE 3		9C MUS	10B SAF		
TUE 4			10C SAF	8B SAF	
TUE 5		8B KRL	10C ¤ NOMA 4		
TUE 6		10A # TV 1	8A NO 1	9A MUS	9
WED 1		10A ¤ ENNA 2	9B SAF		
WED 2	9B EN	10A ¤ ENNA 1	10C NO		9
WED 3					
WED 4		8B MUS			
WED 5			10C SAF	8B SAF	
WED 6		8B ENNA 3		9B MUS	9
THU 1	B*	8B ENNA 3		8A MUS	9
THU 2	B*	10C MUS	10B SAF	8B SAF	9
THU 3	B*		10C NO		9
THU 4	10B EN	10A ENNA 3	10C SAF		9
THU 5		8B KRL	10C KRL		
THU 6		10C EN	8A NO 1		
FRI 1	10B EN				
FRI 2	9B ¤ NAEN 1		8A NO 1		
FRI 3	9B ¤ NAEN 2	10A MUS	10B SAF		
FRI 4		10A ENNA 3	10C NO	10B MUS	9
FRI 5		10C ¤ ENNA 1			

Such operations never give new conflicts and no messages are displayed. In THU 2 we notice an interchange of teachers. The remainder is a set of teacher changes. This is a fast and simple process.

Assume we have a room table looking like this:

This is the table of the crafts rooms in the school.

In hindsight you realize that teacher HØY can only teach in room VERK while the other teachers accept both rooms. A few lateral drag/drops easily perform the needed interchanges like this:

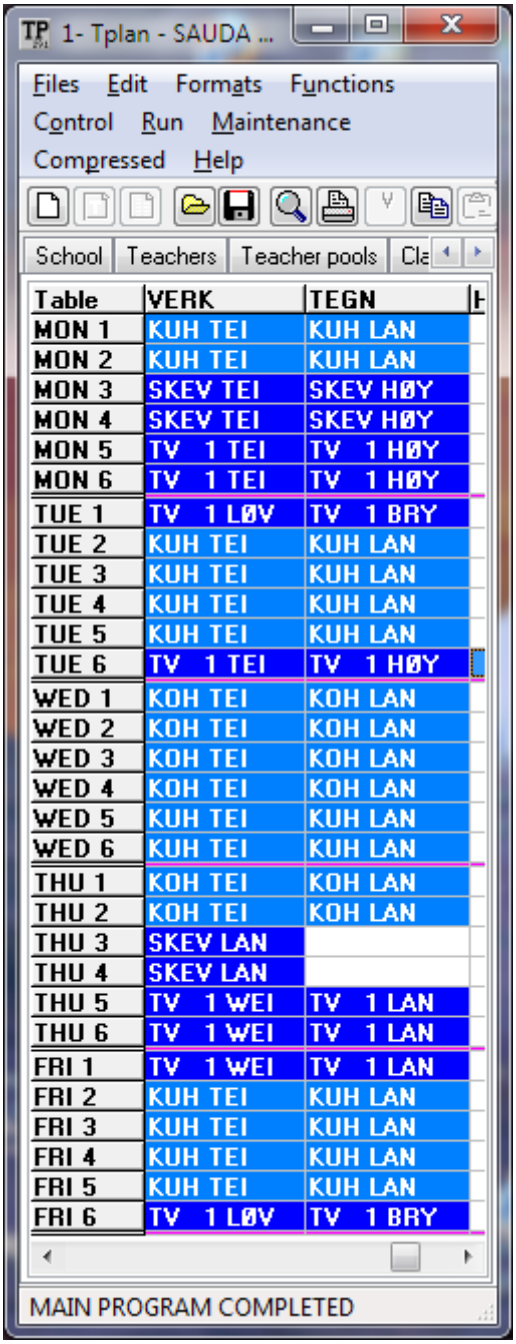


Table	VERK	TEGN
MON 1	KUH TEI	KUH LAN
MON 2	KUH TEI	KUH LAN
MON 3	SKEV TEI	SKEV HØY
MON 4	SKEV TEI	SKEV HØY
MON 5	TV 1 TEI	TV 1 HØY
MON 6	TV 1 TEI	TV 1 HØY
TUE 1	TV 1 LØV	TV 1 BRY
TUE 2	KUH TEI	KUH LAN
TUE 3	KUH TEI	KUH LAN
TUE 4	KUH TEI	KUH LAN
TUE 5	KUH TEI	KUH LAN
TUE 6	TV 1 TEI	TV 1 HØY
WED 1	KOH TEI	KOH LAN
WED 2	KOH TEI	KOH LAN
WED 3	KOH TEI	KOH LAN
WED 4	KOH TEI	KOH LAN
WED 5	KUH TEI	KUH LAN
WED 6	KUH TEI	KUH LAN
THU 1	KOH TEI	KOH LAN
THU 2	KOH TEI	KOH LAN
THU 3	SKEV LAN	
THU 4	SKEV LAN	
THU 5	TV 1 WEI	TV 1 LAN
THU 6	TV 1 WEI	TV 1 LAN
FRI 1	TV 1 WEI	TV 1 LAN
FRI 2	KUH TEI	KUH LAN
FRI 3	KUH TEI	KUH LAN
FRI 4	KUH TEI	KUH LAN
FRI 5	KUH TEI	KUH LAN
FRI 6	TV 1 LØV	TV 1 BRY

A P6 – operation is a fast and simple process and highly to be recommended. It may be slightly awkward if there is some distance on the screen between the columns you want to change or interchange. Try therefore to have "similar" teachers or rooms in the same region in your basic data entry – or create a selection with the teachers in question.

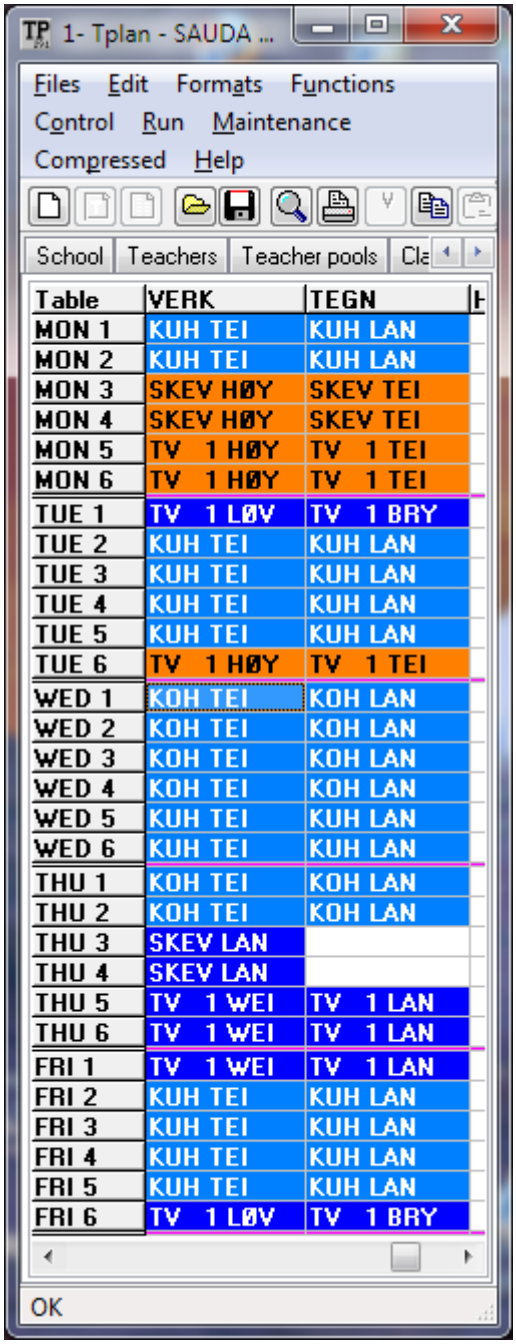


Table	VERK	TEGN
MON 1	KUH TEI	KUH LAN
MON 2	KUH TEI	KUH LAN
MON 3	SKEV HØY	SKEV TEI
MON 4	SKEV HØY	SKEV TEI
MON 5	TV 1 HØY	TV 1 TEI
MON 6	TV 1 HØY	TV 1 TEI
TUE 1	TV 1 LØV	TV 1 BRY
TUE 2	KUH TEI	KUH LAN
TUE 3	KUH TEI	KUH LAN
TUE 4	KUH TEI	KUH LAN
TUE 5	KUH TEI	KUH LAN
TUE 6	TV 1 HØY	TV 1 TEI
WED 1	KOH TEI	KOH LAN
WED 2	KOH TEI	KOH LAN
WED 3	KOH TEI	KOH LAN
WED 4	KOH TEI	KOH LAN
WED 5	KUH TEI	KUH LAN
WED 6	KUH TEI	KUH LAN
THU 1	KOH TEI	KOH LAN
THU 2	KOH TEI	KOH LAN
THU 3	SKEV LAN	
THU 4	SKEV LAN	
THU 5	TV 1 WEI	TV 1 LAN
THU 6	TV 1 WEI	TV 1 LAN
FRI 1	TV 1 WEI	TV 1 LAN
FRI 2	KUH TEI	KUH LAN
FRI 3	KUH TEI	KUH LAN
FRI 4	KUH TEI	KUH LAN
FRI 5	KUH TEI	KUH LAN
FRI 6	TV 1 LØV	TV 1 BRY

6.2.6 F2: Editing in a timetable cell (The F2- dialog)

We have a section of the timetable looking like this:

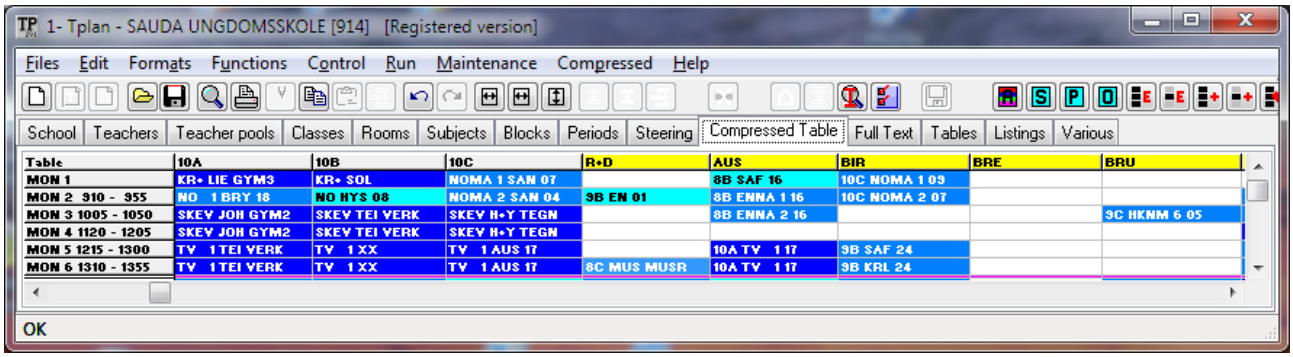
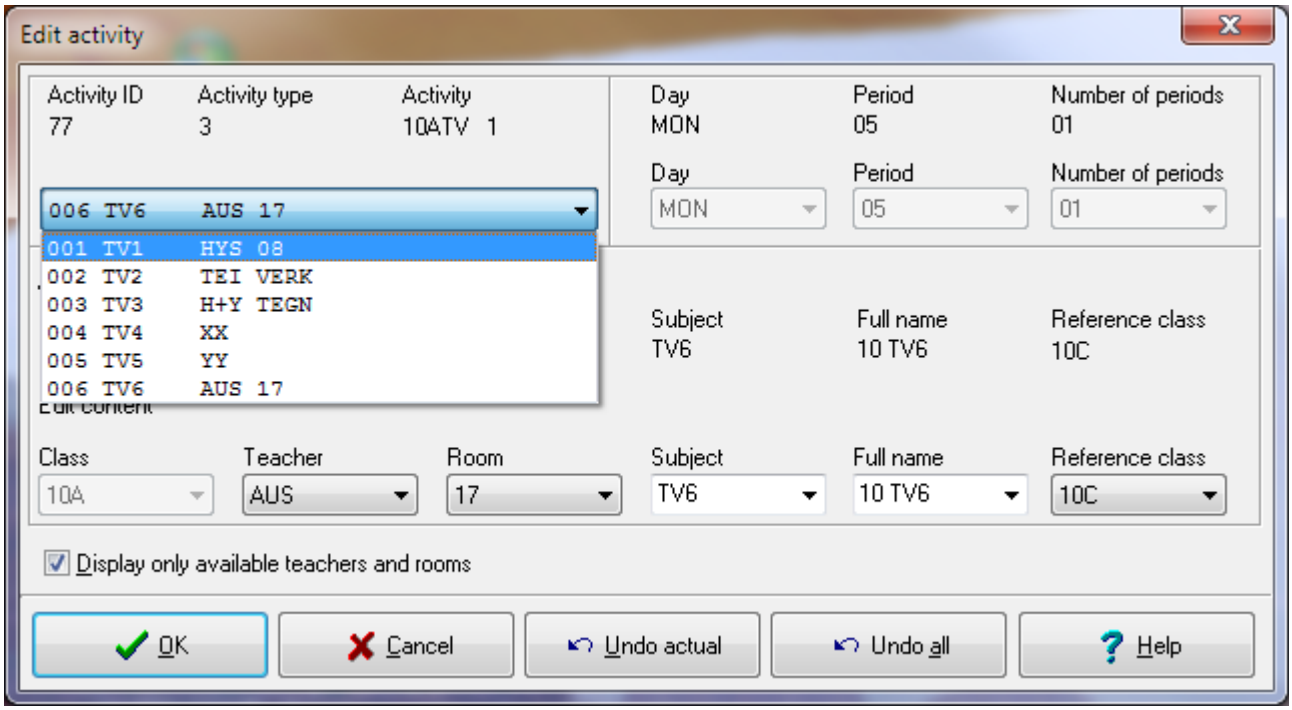
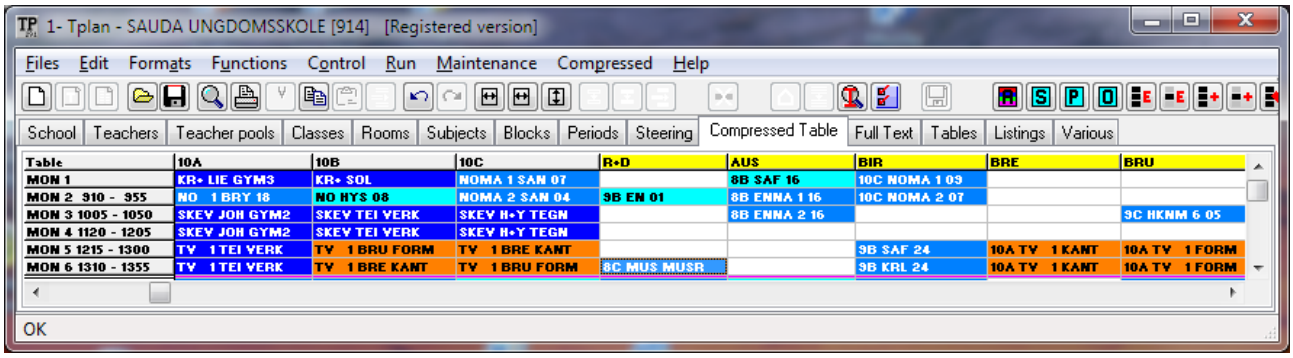


Table	10A	10B	10C	R•D	AUS	BIR	BRE	BRU
MON 1	KR• LIE GYM3	KR• SOL	NOMA 1 SAN 07		8B SAF 16	10C NOMA 1 09		
MON 2 910 - 955	NO 1 BRY 18	NO HYS 08	NOMA 2 SAN 04	3B EN 01	8B ENNA 1 16	10C NOMA 2 07		
MON 3 1005 - 1050	SKEV JOH GYM2	SKEV TEI VERK	SKEV H•Y TEGN		8B ENNA 2 16			9C HKNM 6 05
MON 4 1120 - 1205	SKEV JOH GYM2	SKEV TEI VERK	SKEV H•Y TEGN					
MON 5 1215 - 1300	TV 1 TEI VERK	TV 1 XX	TV 1 AUS 17		10A TV 1 17	9B SAF 24		
MON 6 1310 - 1355	TV 1 TEI VERK	TV 1 XX	TV 1 AUS 17	8C MUS MUSR	10A TV 1 17	9B KRL 24		

TV 1 in MON 5-6 is a block of classes' 10A-10B-10C and several teachers. For some reason teacher AUS changes with teacher BRE and teacher XX changes with teacher BRU and these new teachers shall also use different rooms. Click on any of the TV 1- cells and click F2. You get this dialog:



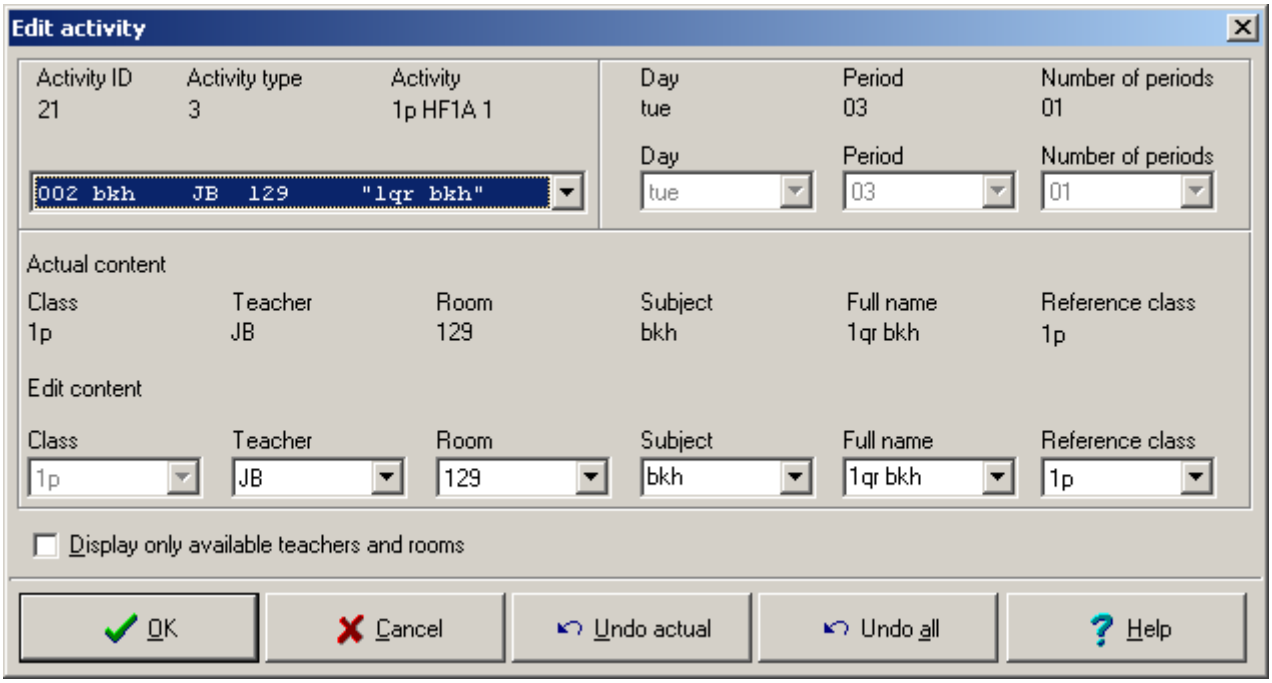
There is drop down list for teachers. Click that and substitute AUS with BRE. Later click on drop down list for rooms and select new room. You repeat that for teacher XX and BRU. This must be done both for both period MON 5 and MON 6. Eventually you end up with a table like this:



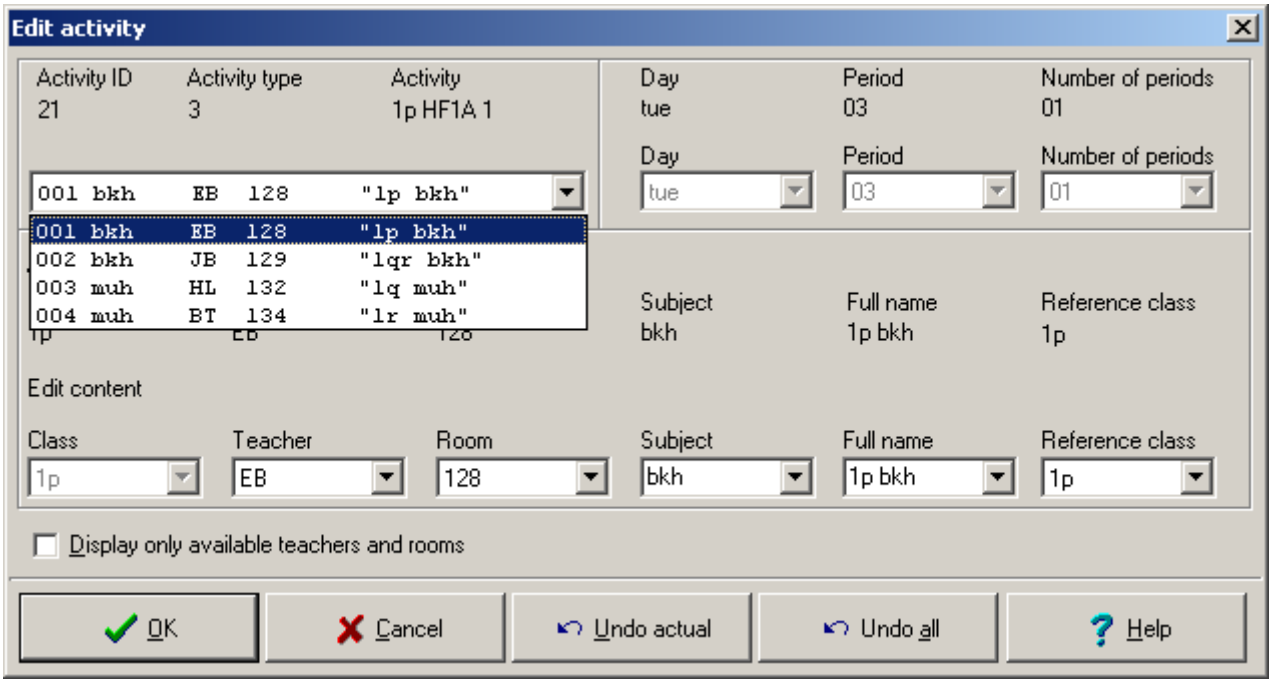
The F2 –dialog is a completely general way to modify the cell content to what you prefer. F2 is a somewhat slower method than the lateral drags shown in previous paragraph but being more general and highly recommended for that reason.

Lasse's comment to the F2-dialog is given here:

When working in the compressed table you can edit an activity by placing the cursor on the activity and pressing the F2 key. This has been the case for many years. The news in version 29 is that the dialog has been given a full makeover.



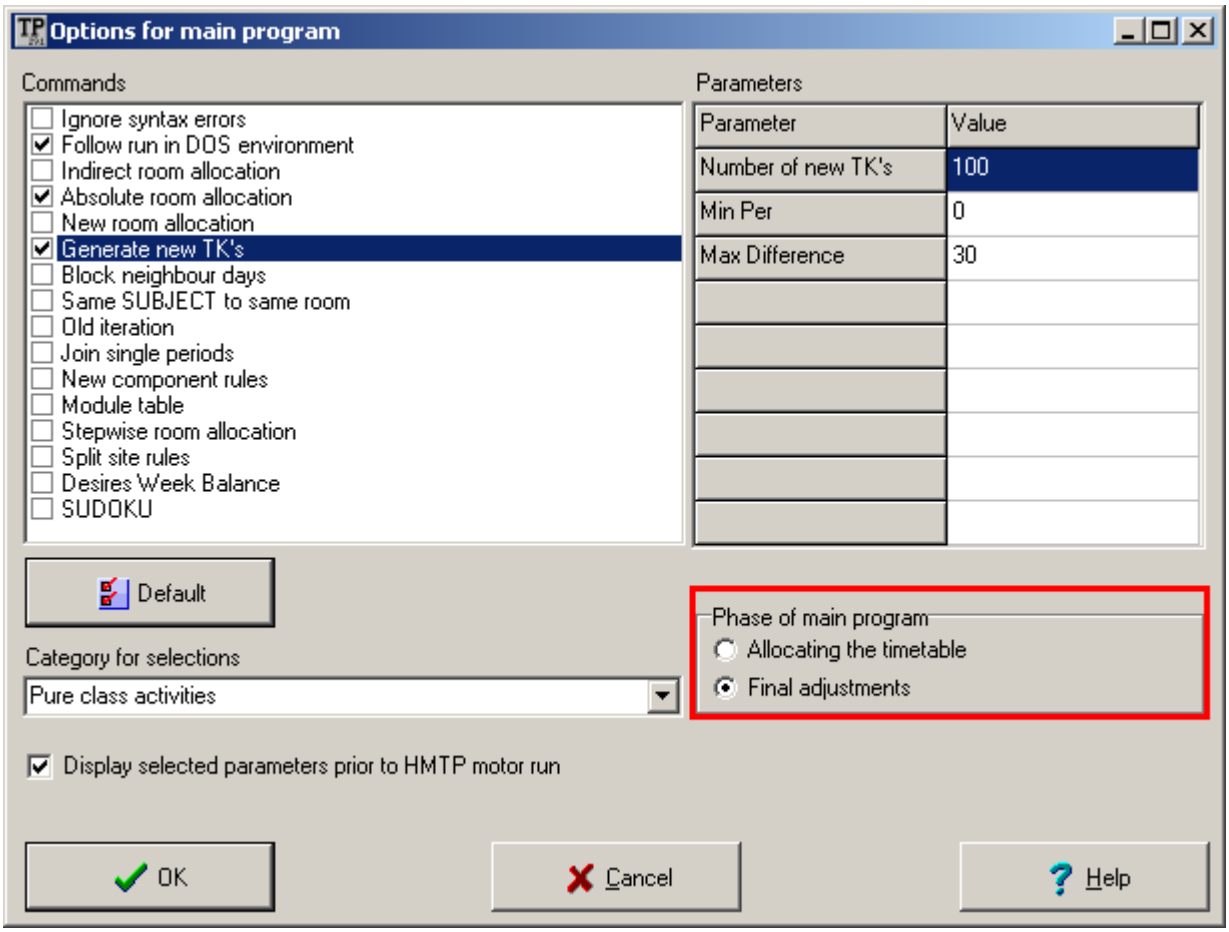
First of all you see the combo box containing all the units included in the activity under consideration.



This activity is made out of 4 units. Every unit can be edited in turn. Only one unit can be edited at a time.

The “Display only available teachers and rooms” checkbox gives you the ability to select another available room and/or teacher for a unit in the activity. You can also edit the subject, the full name and select another reference class.

When you are editing teacher and room it is mandatory that you have selected “Final adjustments” in the Options dialog.



You will find the Options dialog either in the Run dialog or here:

If you forget to set the phase of the main program, the timetable motor will reset any of the changes you have made which does not match the subjects and other registers.

6.2.7 Major changes in a timetable

It happens that you have completed your timetable satisfactory and then something unforeseen happens like getting a different teacher than expected or you lose or receive additional classes. You hate to lose all the work you have invested in your current timetable and want to salvage as much as possible of this. This could maybe be tackled in a number of ways. I believe the most sensible method would be to modify your table cells in **LIST FORMAT (i.e. KlarGrid).**

You have a table looking like this:

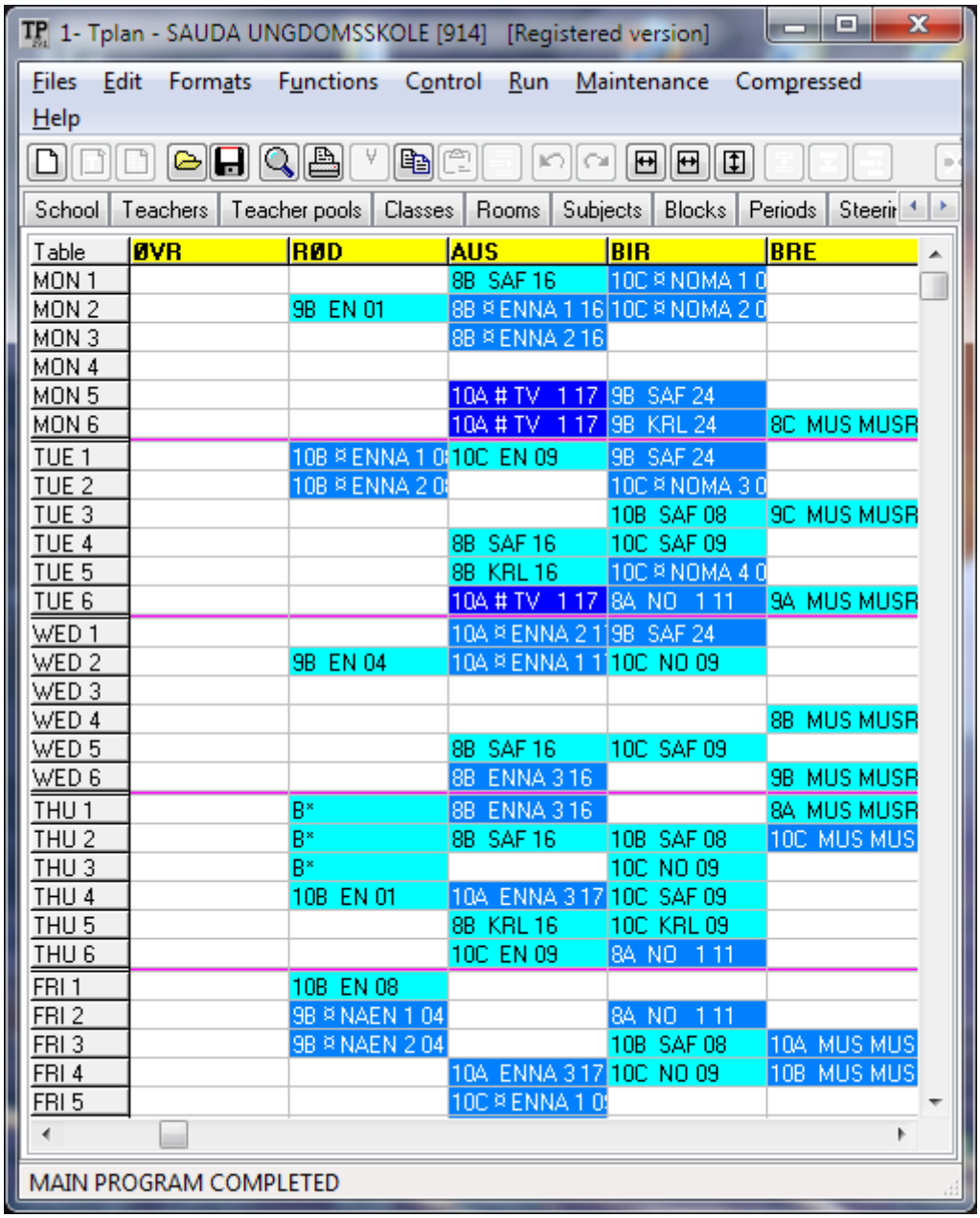
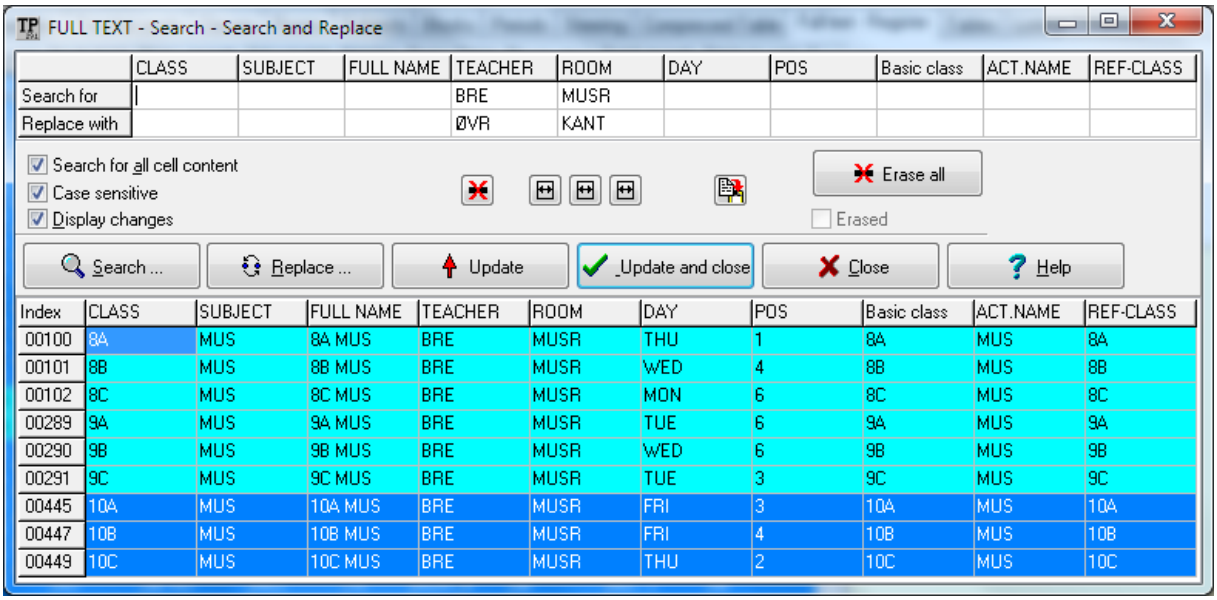


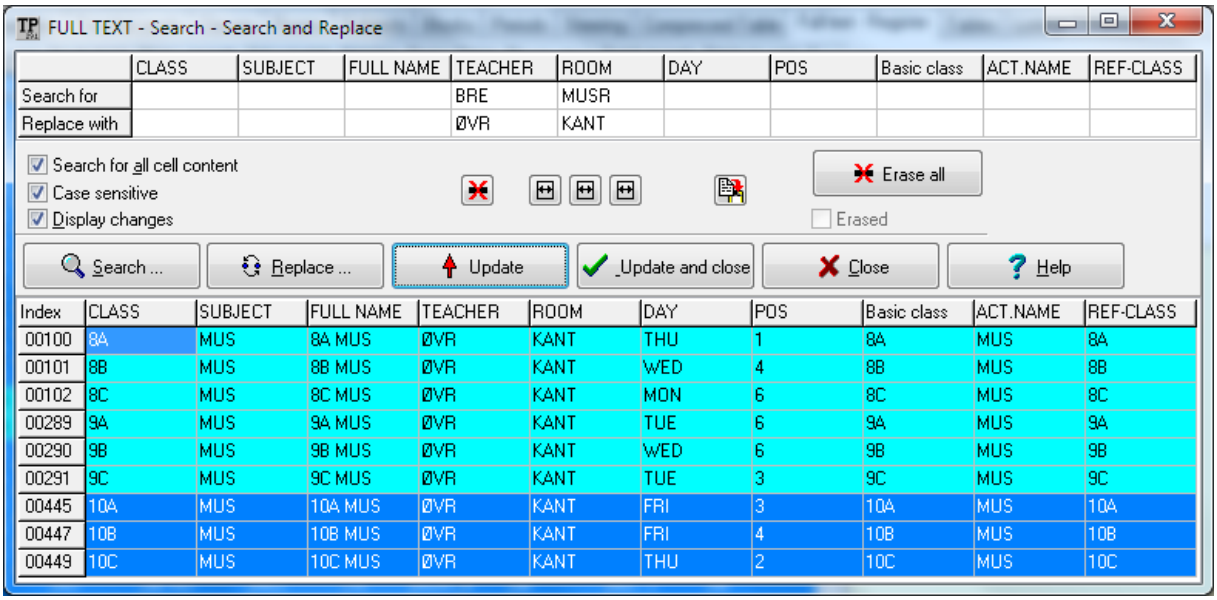
Table	ØVR	RØD	AUS	BIR	BRE
MON 1			8B SAF 16	10C ¤ NOMA 1 0	
MON 2		9B EN 01	8B ¤ ENNA 1 16	10C ¤ NOMA 2 0	
MON 3			8B ¤ ENNA 2 16		
MON 4					
MON 5			10A # TV 1 17	9B SAF 24	
MON 6			10A # TV 1 17	9B KRL 24	8C MUS MUSR
TUE 1		10B ¤ ENNA 1 0	10C EN 09	9B SAF 24	
TUE 2		10B ¤ ENNA 2 0		10C ¤ NOMA 3 0	
TUE 3				10B SAF 08	9C MUS MUSR
TUE 4			8B SAF 16	10C SAF 09	
TUE 5			8B KRL 16	10C ¤ NOMA 4 0	
TUE 6			10A # TV 1 17	8A NO 1 11	9A MUS MUSR
WED 1			10A ¤ ENNA 2 1	9B SAF 24	
WED 2		9B EN 04	10A ¤ ENNA 1 1	10C NO 09	
WED 3					
WED 4					8B MUS MUSR
WED 5			8B SAF 16	10C SAF 09	
WED 6			8B ENNA 3 16		9B MUS MUSR
THU 1		B*	8B ENNA 3 16		8A MUS MUSR
THU 2		B*	8B SAF 16	10B SAF 08	10C MUS MUS
THU 3		B*		10C NO 09	
THU 4		10B EN 01	10A ENNA 3 17	10C SAF 09	
THU 5			8B KRL 16	10C KRL 09	
THU 6			10C EN 09	8A NO 1 11	
FRI 1		10B EN 08			
FRI 2		9B ¤ NAEN 1 04		8A NO 1 11	
FRI 3		9B ¤ NAEN 2 04		10B SAF 08	10A MUS MUS
FRI 4			10A ENNA 3 17	10C NO 09	10B MUS MUS
FRI 5			10C ¤ ENNA 1 0		

Your music teacher is BRE will not appear and in addition you lose your music room MUSR and you shall use room KANT while teacher ØVR substitutes for BRE. This could give you a quite messy adjustment problem. A simple way is this:

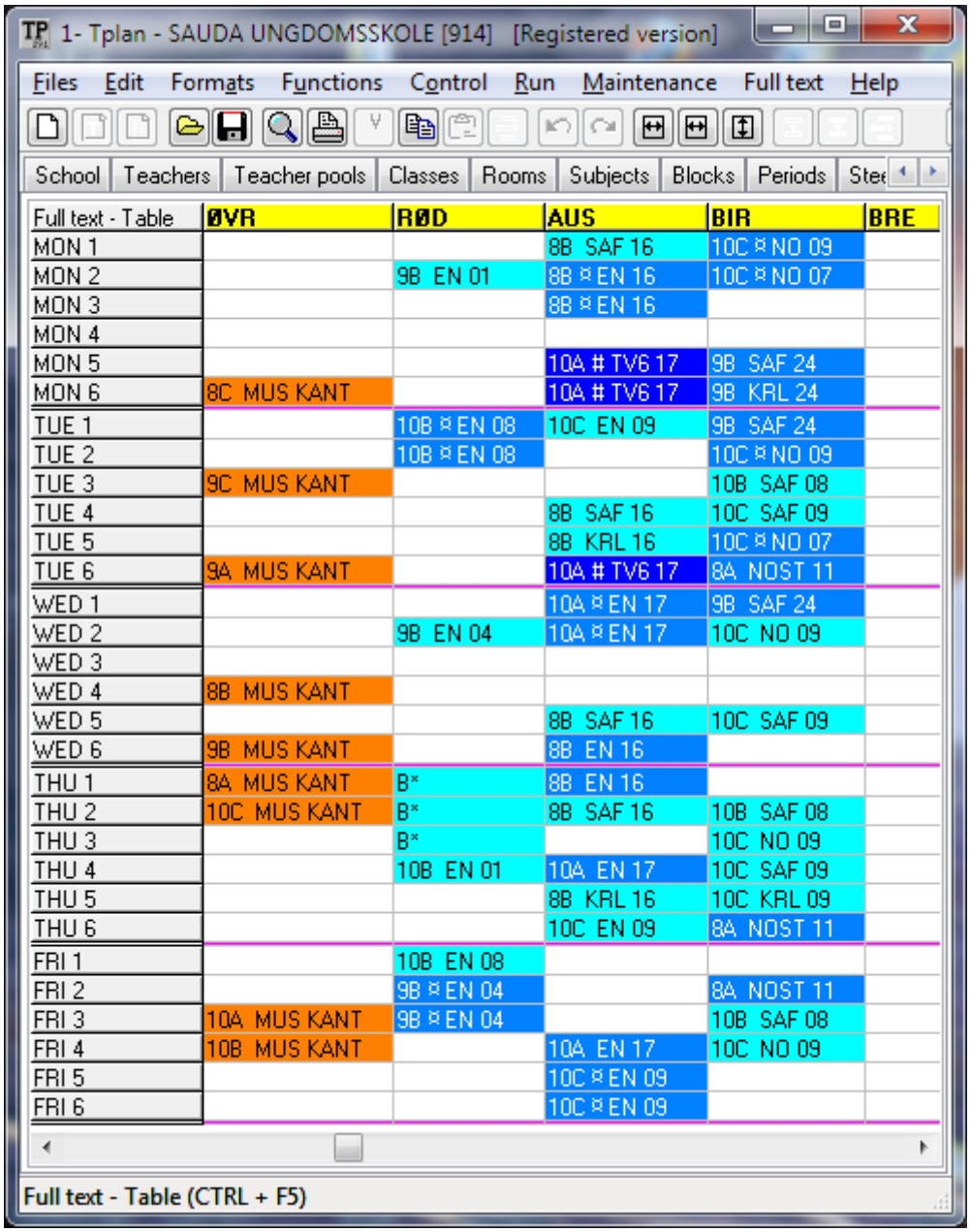
Go to Full Text Table. Go to Full Text List (= ctrl + F8). You then enter the table in List Format. Go to Edit menu and select Advanced Search and Replace. You enter this dialog:



In this case you enter the teacher and room which shall be placed and placing in second line the substitutes. Click Replace and you end up with:



This is as wanted. Click: Update and close and you end up with:

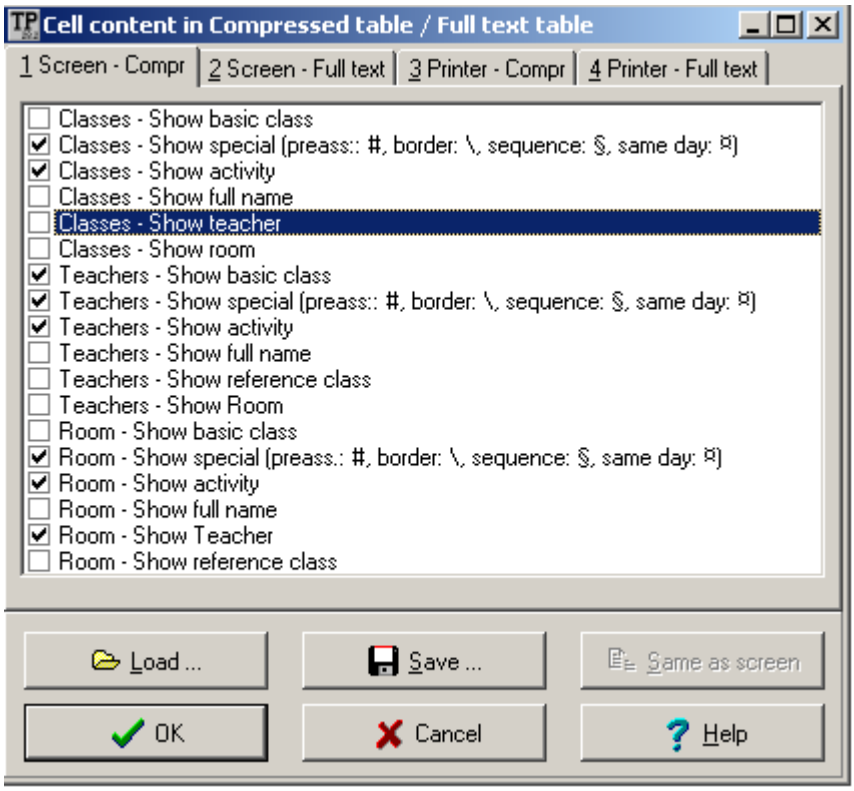


Full text - Table	ØVR	RØD	AUS	BIR	BRE
MON 1			8B SAF 16	10C ¤ NO 09	
MON 2		9B EN 01	8B ¤ EN 16	10C ¤ NO 07	
MON 3			8B ¤ EN 16		
MON 4					
MON 5			10A # TV6 17	9B SAF 24	
MON 6	8C MUS KANT		10A # TV6 17	9B KRL 24	
TUE 1		10B ¤ EN 08	10C EN 09	9B SAF 24	
TUE 2		10B ¤ EN 08		10C ¤ NO 09	
TUE 3	9C MUS KANT			10B SAF 08	
TUE 4			8B SAF 16	10C SAF 09	
TUE 5			8B KRL 16	10C ¤ NO 07	
TUE 6	9A MUS KANT		10A # TV6 17	8A NOST 11	
WED 1			10A ¤ EN 17	9B SAF 24	
WED 2		9B EN 04	10A ¤ EN 17	10C NO 09	
WED 3					
WED 4	8B MUS KANT				
WED 5			8B SAF 16	10C SAF 09	
WED 6	9B MUS KANT		8B EN 16		
THU 1	8A MUS KANT	B*	8B EN 16		
THU 2	10C MUS KANT	B*	8B SAF 16	10B SAF 08	
THU 3		B*		10C NO 09	
THU 4		10B EN 01	10A EN 17	10C SAF 09	
THU 5			8B KRL 16	10C KRL 09	
THU 6			10C EN 09	8A NOST 11	
FRI 1		10B EN 08			
FRI 2		9B ¤ EN 04		8A NOST 11	
FRI 3	10A MUS KANT	9B ¤ EN 04		10B SAF 08	
FRI 4	10B MUS KANT		10A EN 17	10C NO 09	
FRI 5			10C ¤ EN 09		
FRI 6			10C ¤ EN 09		

Timetable has been adjusted completely in one simple step. I could easily complicate the above example, but hopefully I got the general idea presented.

The next 2 paragraphs are a direct copy of current user manual since no modifications have been done here (but very definitely look on the last paragraph.)

6.2.8 THE CELL CONTENT IN KOMPRGRID AND SKEMAGRID.



You select this by choosing: Functions > Settings > Compr (or Timetable) > Content of cell in Compr (or Full text). The following dialogue is shown:

For each resource (class/teacher/room) we may require 6 types of information. We show this completely for classes and mention what is different for teachers and rooms

Classes

Show basic class**: The basic class is the first class in the activity.**

Show special: **Shows the special symbols mentioned in previous paragraph. We might gradually introduce new special symbols.**

Show activity***:* Name of activity (you will normally want this)**

Show full name***:* Shows full name for corresponding subject. Normally you don't want this in compressed table, but you may want full name in full text tables.**

Show teacher***:* Shows teacher initial. In KomprGrid not all teacher/room groups are shown but you get a complete survey in SkemaGrid. (Full text)**

Show room***:* Shows corresponding room for teacher.**

Teachers

5 parameters the same as for classes (teacher is lacking). In addition we get a new parameter:

Show reference class***:* Basic class is the first class in an activity. Reference class is the class column under which this particular teacher is placed in full text tables. (We might possibly want to modify this in the final stages)**

Rooms

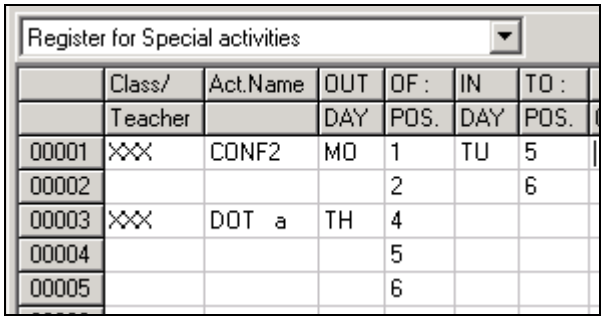
5 parameters are the same as for classes but reference class is shown instead of room.

Exactly the same information might be shown for full text tables *and make a note of you have a different cell content definition for the printing of tables and what is shown on the screen.* **When finally printing your tables check also the various facilities mentioned in the File- menu**

In the above figure I have indicated my own preference when working with compressed tables; in fact I might even remove some of the shown checkmarks to compress the survey.

6.2.9 Special activities and Rotation or Change of Days

We access this register through tab sheet: Various, and the menu selection given transfer to this register:



This is an alternative way for making movements/interchanges in compressed tables.

We do as much as possible in compressed tables, but this register must be used in case the activity is not included in a class column in compressed tables.

These cases are:

1. Conference activities (XXX)
2. Free time for teachers included in timetable. (As example half-day free for teachers),
3. LUNCH for teachers.

The procedure for using the above register (Special activities) and also the register in next paragraph (Deletion of many activities) MUST be as follows:

Enter the adjustments you require in these registers.

1. Run a new Transfer program (to let Hmtp get hold of these adjustments).
2. Rerun Analysis program and build of course on current timetable.
3. Such adjustments will frequently have consequences for the room allocation which should be rerun. (use Run option: New room allocation for that)
4. Check that your compressed table is adjusted as required. If there are errors, return to point 1-3 and correct.
5. When adjustments are as required, BLANK what you have entered in Special activities and Deletion of many activities. Finish the process with a final Transfer run to let Hmtp also have these registers blanked, and you may then continue with normal adjustments.

Definition of register:

1. Class/Teacher
   Usually the basic class for the activity which shall be placed or deleted. The most frequent class symbol here will be XXX (conference class).
   A teacher initial here signifies we are adjusting LUNCH for a teacher.
   If BLANK field, we use class symbol from previous line.
2. Act.Name
   Activity name for the activity to be placed or deleted. If BLANK field, we use name from previous line.
3. OUT OF: DAY POS
   Day and position where the activity shall be deleted. We use these day symbols: MO, TU, WE, TH and FR. If day symbol is lacking and position is filled in, we use day symbol from previous line. **At least** one of the two position field must be filled in, to make this line effective.
4. IN TO: DAY POS

   Day and position where the activity shall be placed, and the rules are as above. You may perform deletion and placement in the same line.

In the above figure we have done the following:

1. Conference period, CONF2, is moved from MON 1-2 to TUE 5-6.
2. Half day free for teacher DOT is deleted from THU 4-6

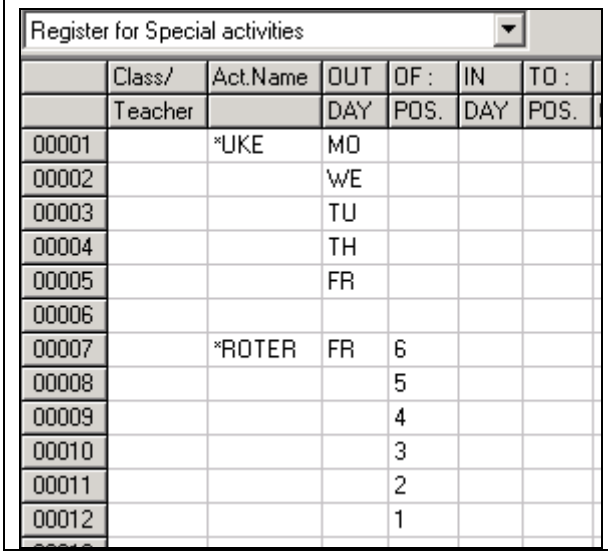
6.2.9.1 Interchange days, rotate the periods on a day

It is not unusual that we detect possibilities for improving some desirable requirements by interchanging two days completely or by rotating the periods on a day. (For instance in such a way that "difficult" subjects get better teaching time or to improve some teacher tables.) It is very difficult to do such adjustments the traditional way, and we use two conventions to achieve this

***UKE** If this name is entered in the field Act.Name it signifies that the next 5 (10) lines make up a unit, and defines the new order of the days.

***ROTER** If this name is entered in the field Act.Name and you enter a day symbol in the OUT-field, the next lines define the new order of the periods on that day.

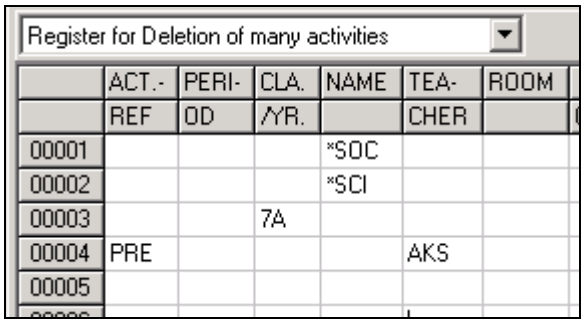
This figure shows an example:



	Class/ Teacher	Act.Name	OUT DAY	OF : POS.	IN DAY	TO : POS.
00001		*UKE	MO			
00002			WE			
00003			TU			
00004			TH			
00005			FR			
00006						
00007		*ROTER	FR	6		
00008				5		
00009				4		
00010				3		
00011				2		
00012				1		

In the figure we have stated that we shall interchange Tuesday and Wednesday. We have rotated the periods on Friday completely making the last period the first etc. When finished data entry here, we rerun Transfer program and continue with an Analysis and build on current timetable. Check result and blank this register and rerun Transfer program. Follow exact same procedure as explained above.

6.2.10 DELETION OF MANY ACTIVITIES



	ACT.- REF	PERI- OD	CLA. /YR.	NAME	TEA- CHER	ROOM
00001				*SOC		
00002				*SCI		
00003			7A			
00004	PRE				AKS	
00005						

We access this register through tab sheet: Various. The menu selection transfer to this register:

This register if defined exactly the same way as register for Activity References. The function of the register is:

In the register we define in the usual way an activity set but we disregard activities being preassigned in positional directives. This complete activity set is removed from current timetable if we run:

Transfer + Analysis + Build on partial table

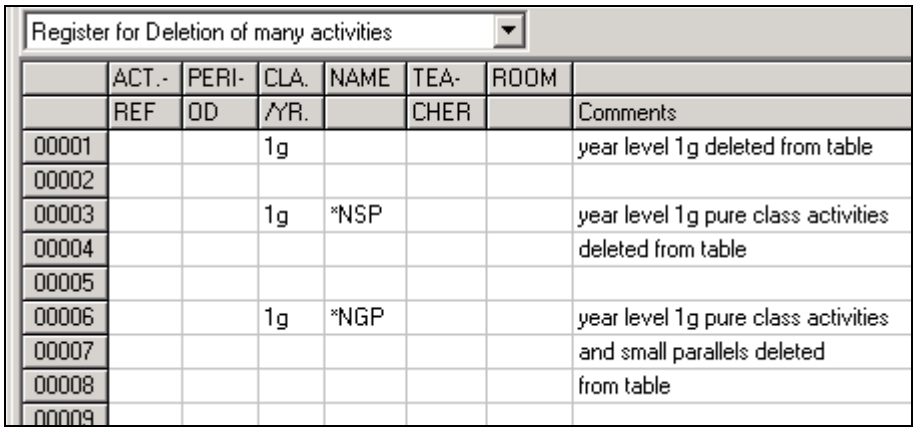
It is usually an advantage that such a removal does take effect for presassignment, but occasionally we will also remove these. This is achieved by entering the reserved identifier PRE in the ACT.-REF field.

In the figure above we have required to remove all teaching in social studies and science. We have also removed all activities for class 7A and teacher AKS and for the latter we also remove possible preassignments. It is obvious that this deletion technique is very simple and efficient when we want to remove larger parts. In the file Lian.nnn we are informed about what we have deleted; for instance like this:

```
****    WARNINGS      ****
ACTIVITIES BEING REMOVED BY DEL-COMMAND:
 8A  TV   1 9A  TV   1 9A  TV   1 10A TV   1 10A TV   1

PREASSIGNEMENTS BEING REMOVED     :
 10A TV   1 10A TV   1
```

A frequent situation is that some year levels have same timetable for a whole year while other year level changes tables on a half year basis. Assume the latter being the case for year level 1g. The following figure show three alternative ways of deleting activities in year level 1g:


Register for Deletion of many activities

	ACT.-	PERI-	CLA.	NAME	TEA-	ROOM	
	REF	OD	/YR.		CHER		Comments
00001			1g				year level 1g deleted from table
00002							
00003			1g	*NSP			year level 1g pure class activities
00004							deleted from table
00005							
00006			1g	*NGP			year level 1g pure class activities
00007							and small parallels deleted
00008							from table
00009							

We refer to the Definition fields in Positional directives for definition of the reserved identifiers *NSP and *NGP

This is a very efficient way of deleting a year level or parts of a year level. In particular if you in the continued runs for creating new tables for 1g use the run option: Absolute room allocation, the other year levels will keep their former tables 100% intact.

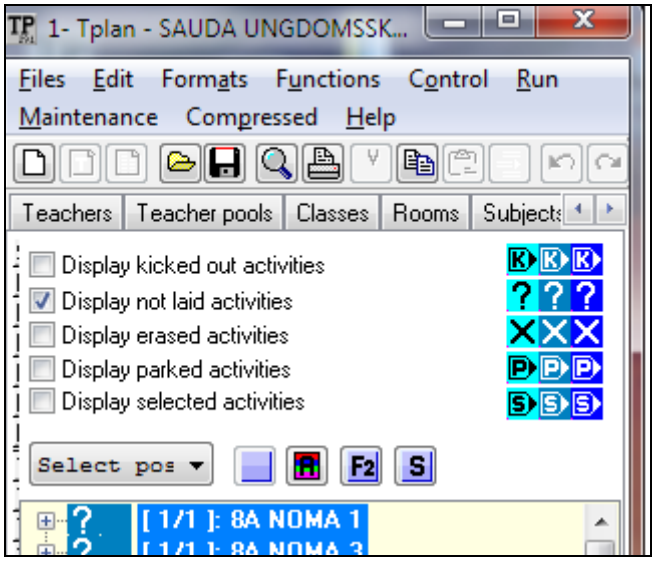
Other cases for using such deletion technique is for timetabling project weeks for various classes, or if certain teacher teams are creating their own timetables more or less independent of the rest of the school.

Running in interactive mode, we will need the use of this register more frequently: During this process we might need to change teachers. You are not much helped only by doing the change in subject register since the original teacher is still in the current timetable which overrules subject register. If you remove the activity with teacher change in the register above, then this activity is removed from current timetable and your changes in subject register will take effect.

Finally, when working with this register follow the same procedure as explained in previous paragraph.

6.2.11 Use of the Kickout list in other contexts. (Manual assignments)

The heading of the Kickout list look like this:

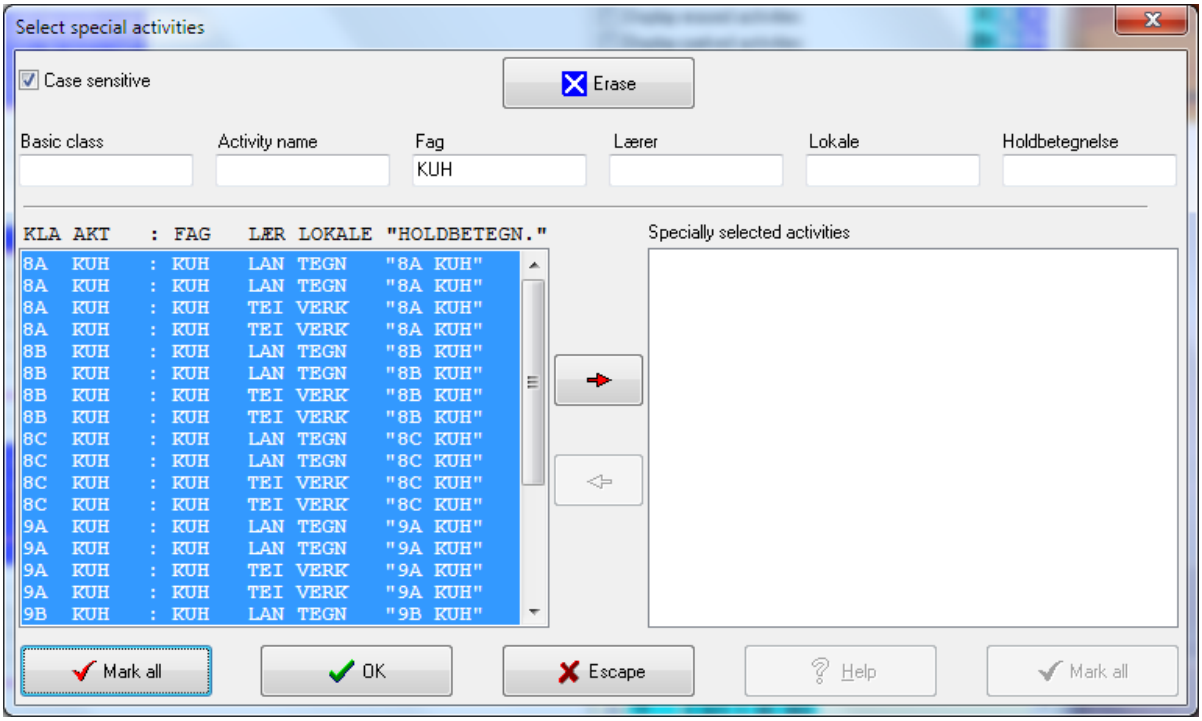


99 % of the time you will need to display only the Kickout List. Normally you then select an activity in this list and perform a P4- operation as explained. If you click Select pos and do that, the next button will then show the P1-symbol and you might use this dialog for P1. (My strong preference is to use directly a lateral drag/drop for P1). Alternatively you might want to modify the content of a Kickout by using the F2- button above. The S – button will be explained shortly.

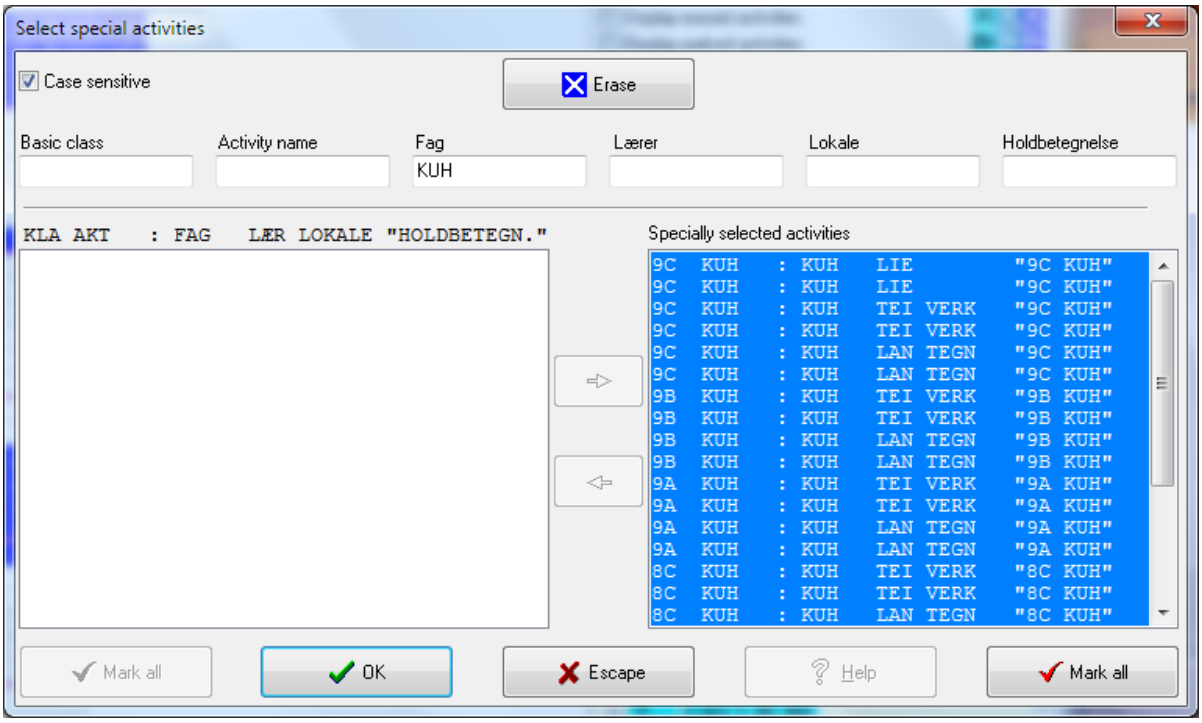
The check mark: Display not yet allocated activities allow you to inspect all activities remaining to be allocated.

It could happen that you in the odd case needed to assign some of these activities manually. This is somewhat inconvenient since this list is usually very large. I must confess that I have not found the check mark: Display erased activities meaningful (It might get a meaning later) The check mark: Display parked activities is intended to cover the case where you only are working with a partial timetable; say you are working only with the upper forms of a table and disregard lower forms for the moment. By checking Parked activities you then also get access to lower forms and if needed you may manually assign some of these activities.

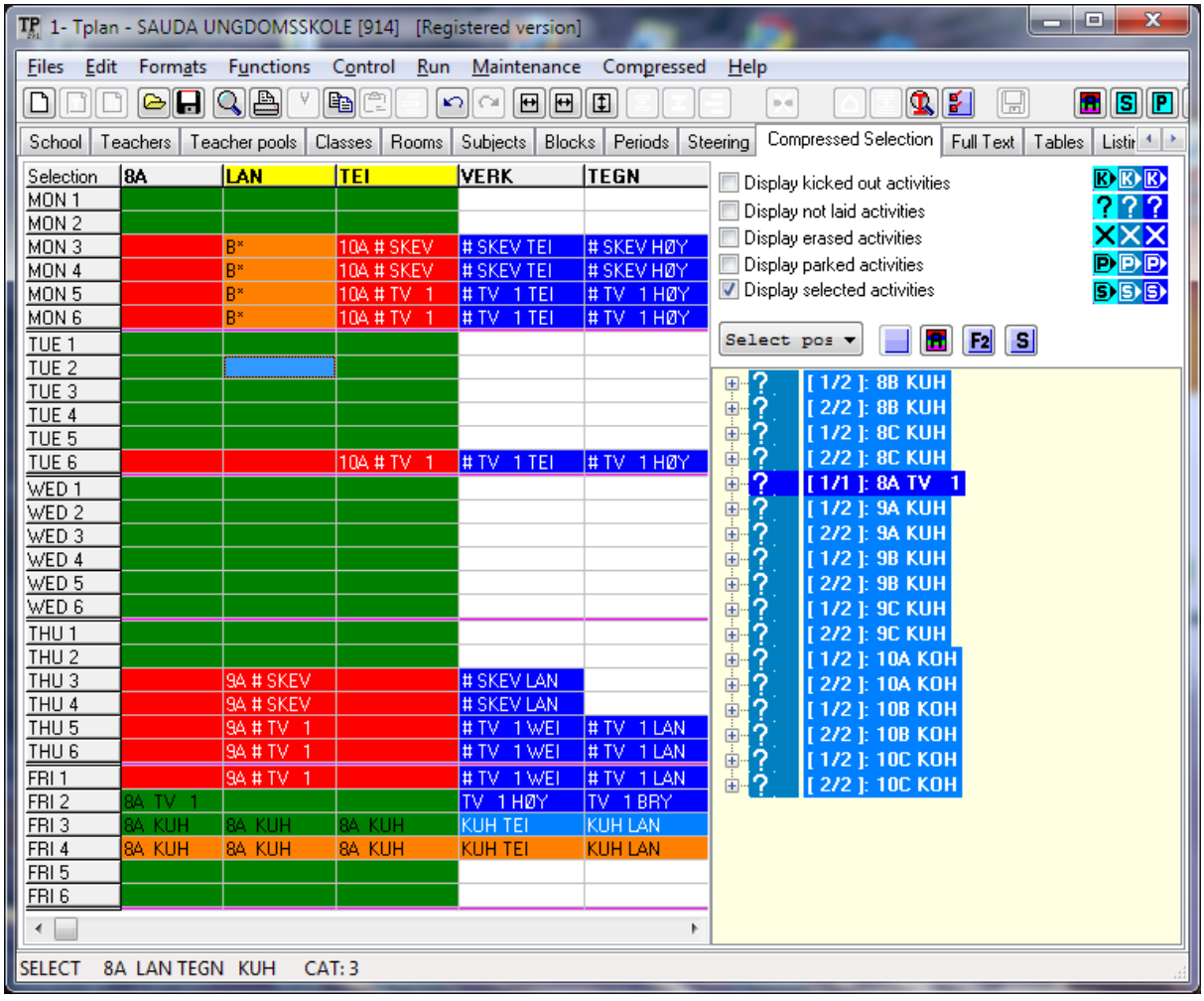
The really exiting check mark is the last: Display selected activities combined with the use of the S- button. By clicking that you get this dialog:



In the first line I can define the set of activities I am interested in. Next I check the button Mark all down left, and that lit an arrow pointing to the right. Click on that and the activities to the left are moved to the right like this:



I am ready to make a different selection in the first line and get that to the left in the above figure, mark that and move these new activities to the right etc. (in case I make unfortunate selections I can mark parts of the right side and move that back to the left) . By then checking on the last check marker I might end up with something like this:



That figure is the point of this exercise: In the current case I have selected all activities using the Craft rooms: VERK and TEGN. I am now in a position to "hand knit" those two rooms in whatever way I want. THE OUTLINED PROCESS MAKES WHAT WE EARLIER CALLED "OLD COMPRESSED TABLE" WHERE YOU COUL MANUALLY ENTER NEW ASSIGNMENTS AND BLOCKINGS, COMPLETELY REDUNDANT SINCE IT NOW CAN BE EASILY DONE BY A SET OF P1- OPERATIONS. To complete the picture you may notice there is some manually created blockings (B*) in the above figure. This is performed by right clicking on some cell and either use Shift + F2 (= B*) or Shift+ F7 (=b*) or you may use these function keys directly on this cell. In short we lack nothing which "Old Compressed" could do.

For the past 10 years I have been the warmest defender of techniques like "Old Compressed" since I preferred simple and fast adjustment processes and not all the slowness from so called Windows operations in earlier versions of Tplan. I now wave a light-hearted good bye to my dear old friend: "Old Compressed". I find it rather ironical when writing about the techniques in this paragraph: Here I have devoted all my life to find a complex logical solution of a timetable, and the very last thing I end up with is demonstrating a cute way of doing things manually. (Well I see the need for that in some cases.)

I will give some concluding remarks about the work with P4, P1 and P2.

For an operation with P1 and P2 to prove useful, you must nearly always make some compromise. If you only select some apparently available position, you may safely assume that Tplan is perfectly aware of that, and Tplan has its reasons for not using that position. One postpones or shifts the problem to some other activity, perhaps making the problem more complex by choosing such a position. (I do it regardless sometimes). The most common compromises in a conflict situation are:

1. Modify the period requirement for a subject (most usual)
2. Use undesirable rooms.
3. Ignore teacher blockings or other requirements to the timetable.

Tplan could of course do such things automatically, **however it is completely against my basic philosophy that Tplan shall do compromises on its own.**

I come from a time where the manual adjustments were done with paper, pencil and rubber. It could lead to enormous interchange chains to assign a kickout (I remember cases with 30 -50 steps). These days are now history due to the following:

- The various selections you can do using P4, gives a dramatically improved survey compared with the techniques of yester. The forthcoming adjustment work is much simpler and easier to survey; in particular use KtempGrid rather than KomprGrid if you choose the correct selections.
- The current level of the algorithmic foundation of Tplan has been improved to an extent where it is a question of marginal returns. Nobody is able to make a timetable considerably better than Tplan.
- The typical adjustment work will be frequent use of P1 where the number of steps is very small. P2 will also be used.
- Now if a number of operations with P1 and P2 lead to a gradually increasing chaos, it is high time to forget what you have done till now. Go back to the start and concentrate about:
    a. Try to make better steering directives. Try a number of complete runs, simply to get a better survey of the complexity in the timetable.
    b. Inspect carefully the logical analysis. Is the problem stated too ambitiously?

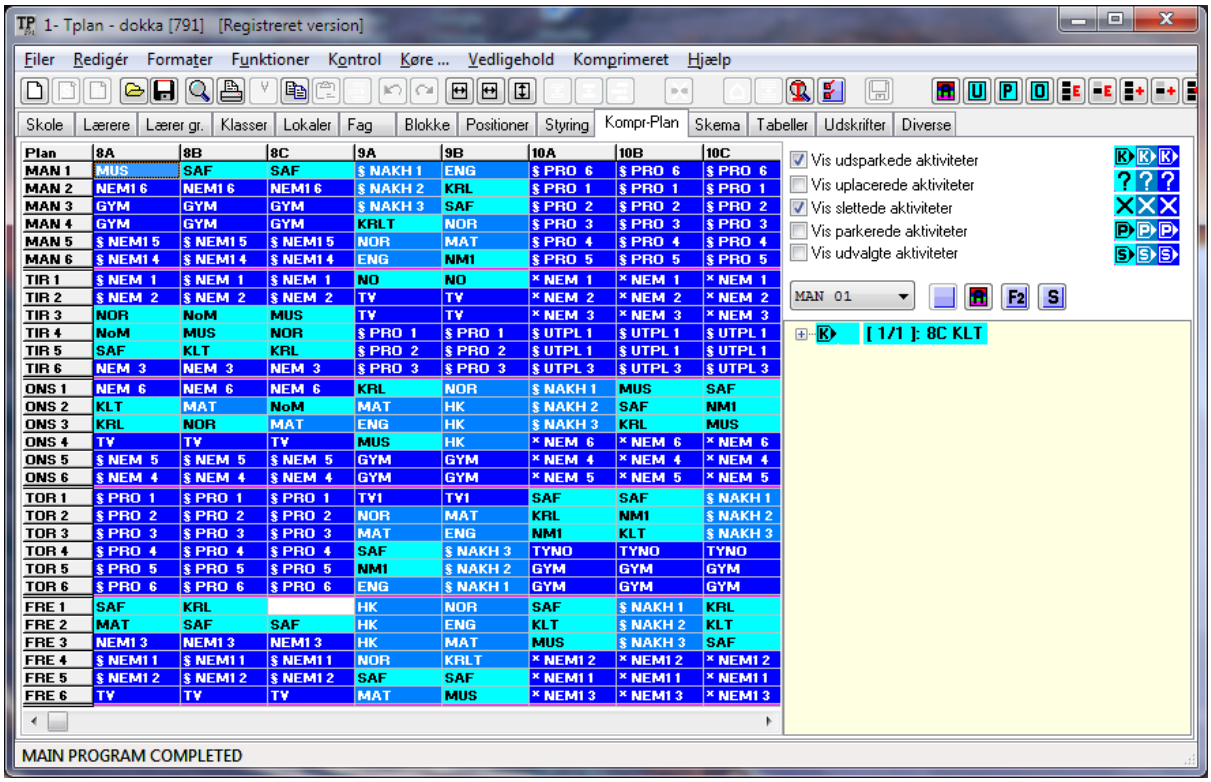
c. If you don’t see a solution through point 1 and 2, you will have to revaluate the basis for your desired school structure.

- Believe me, it goes much easier to forget the chaos you have created and start with blank pages and learn from the experiences you have made.

6.3 Examples of adjusting timetables using drag/drop – techniques

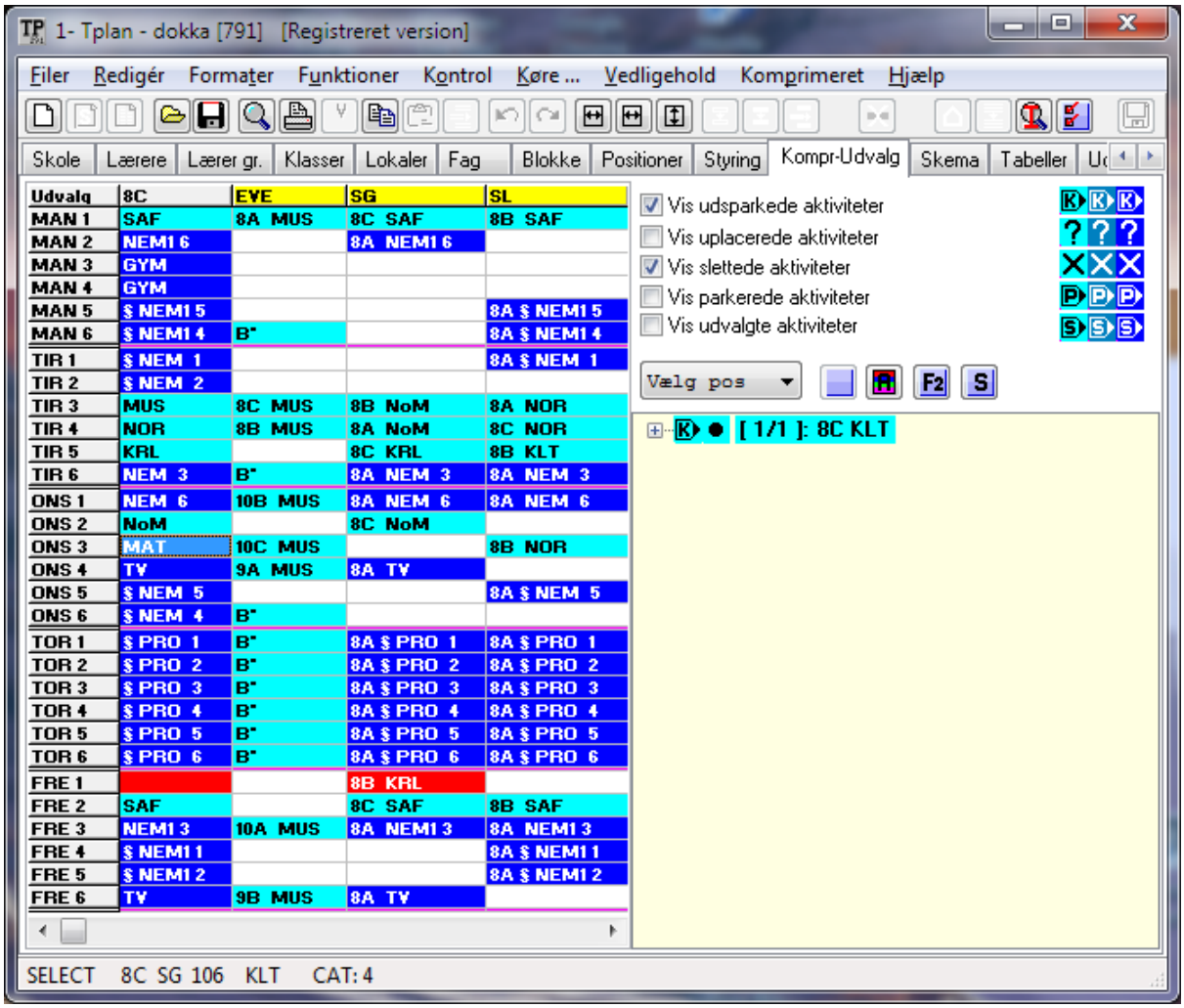
The previous chapter showed the principles for using drag/drop in Tplan. Many examples were rather artificial from a timetabling point of view. Here we will show more realistic examples. This presentation has some practical problems: We need a lot of figures to show everything and the A4-format is too small for complete screen dumps. I limit the no. of figures and work mainly with a selection (KtempGrid) or a part of a selection. **I assume most is interested in learning the basics of drag/drop, while none is interested in the complete solution of the examples I am showing**. I will do a lot of shortcuts here and there while I shall try to pinpoint what might be general in various operations. I could have wished to use more Danish examples and perhaps even a more varied set of school structures. But I have to adapt to A4 and Danish schools usually have a large time frame or they are just too simple for my examples.

6.3.1 Example 1

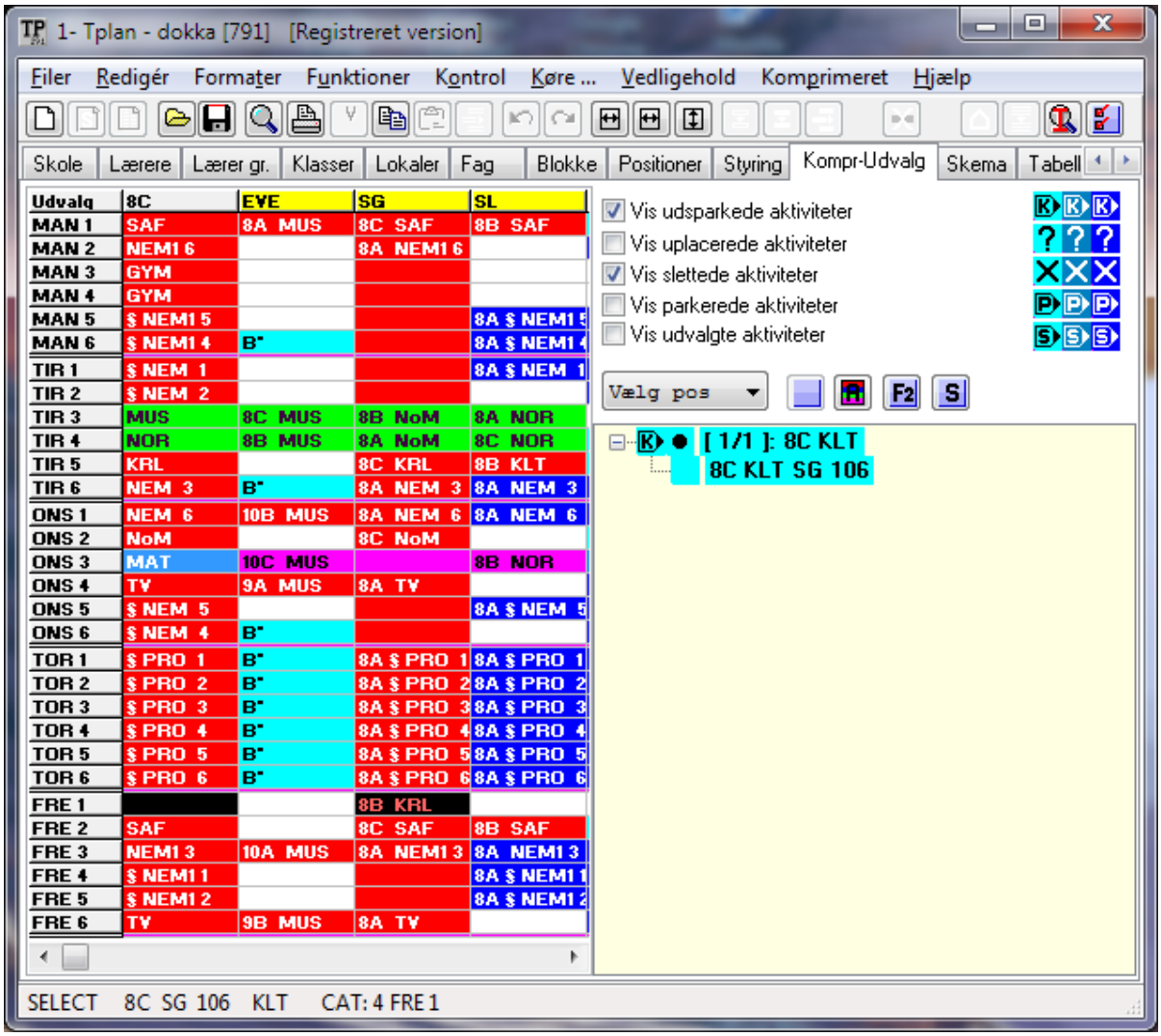


Plan	8A	8B	8C	9A	9B	10A	10B	10C
MAN 1	MUS	SAF	SAF	$ NAKH 1	ENG	$ PRO 6	$ PRO 6	$ PRO 6
MAN 2	NEM1 6	NEM1 6	NEM1 6	$ NAKH 2	KRL	$ PRO 1	$ PRO 1	$ PRO 1
MAN 3	GYM	GYM	GYM	$ NAKH 3	SAF	$ PRO 2	$ PRO 2	$ PRO 2
MAN 4	GYM	GYM	GYM	KRLT	NOR	$ PRO 3	$ PRO 3	$ PRO 3
MAN 5	$ NEM1 5	$ NEM1 5	$ NEM1 5	NOR	MAT	$ PRO 4	$ PRO 4	$ PRO 4
MAN 6	$ NEM1 4	$ NEM1 4	$ NEM1 4	ENG	NM1	$ PRO 5	$ PRO 5	$ PRO 5
TIR 1	$ NEM 1	$ NEM 1	$ NEM 1	NO	NO	* NEM 1	* NEM 1	* NEM 1
TIR 2	$ NEM 2	$ NEM 2	$ NEM 2	TV	TV	* NEM 2	* NEM 2	* NEM 2
TIR 3	NOR	NoM	MUS	TV	TV	* NEM 3	* NEM 3	* NEM 3
TIR 4	NoM	MUS	NOR	$ PRO 1	$ PRO 1	$ UTPL 1	$ UTPL 1	$ UTPL 1
TIR 5	SAF	KLT	KRL	$ PRO 2	$ PRO 2	$ UTPL 1	$ UTPL 1	$ UTPL 1
TIR 6	NEM 3	NEM 3	NEM 3	$ PRO 3	$ PRO 3	$ UTPL 3	$ UTPL 3	$ UTPL 3
ONS 1	NEM 6	NEM 6	NEM 6	KRL	NOR	$ NAKH 1	MUS	SAF
ONS 2	KLT	MAT	NoM	MAT	HK	$ NAKH 2	SAF	NM1
ONS 3	KRL	NOR	MAT	ENG	HK	$ NAKH 3	KRL	MUS
ONS 4	TV	TV	TV	MUS	HK	* NEM 6	* NEM 6	* NEM 6
ONS 5	$ NEM 5	$ NEM 5	$ NEM 5	GYM	GYM	* NEM 4	* NEM 4	* NEM 4
ONS 6	$ NEM 4	$ NEM 4	$ NEM 4	GYM	GYM	* NEM 5	* NEM 5	* NEM 5
TOR 1	$ PRO 1	$ PRO 1	$ PRO 1	TYI	TYI	SAF	SAF	$ NAKH 1
TOR 2	$ PRO 2	$ PRO 2	$ PRO 2	NOR	MAT	KRL	NM1	$ NAKH 2
TOR 3	$ PRO 3	$ PRO 3	$ PRO 3	MAT	ENG	NM1	KLT	$ NAKH 3
TOR 4	$ PRO 4	$ PRO 4	$ PRO 4	SAF	$ NAKH 3	TYNO	TYNO	TYNO
TOR 5	$ PRO 5	$ PRO 5	$ PRO 5	NM1	$ NAKH 2	GYM	GYM	GYM
TOR 6	$ PRO 6	$ PRO 6	$ PRO 6	ENG	$ NAKH 1	GYM	GYM	GYM
FRE 1	SAF	KRL		HK	NOR	SAF	$ NAKH 1	KRL
FRE 2	MAT	SAF	SAF	HK	ENG	KLT	$ NAKH 2	KLT
FRE 3	NEM1 3	NEM1 3	NEM1 3	HK	MAT	MUS	$ NAKH 3	SAF
FRE 4	$ NEM1 1	$ NEM1 1	$ NEM1 1	NOR	KRLT	* NEM1 2	* NEM1 2	* NEM1 2
FRE 5	$ NEM1 2	$ NEM1 2	$ NEM1 2	SAF	SAF	* NEM1 1	* NEM1 1	* NEM1 1
FRE 6	TV	TV	TV	MAT	MUS	* NEM1 3	* NEM1 3	* NEM1 3

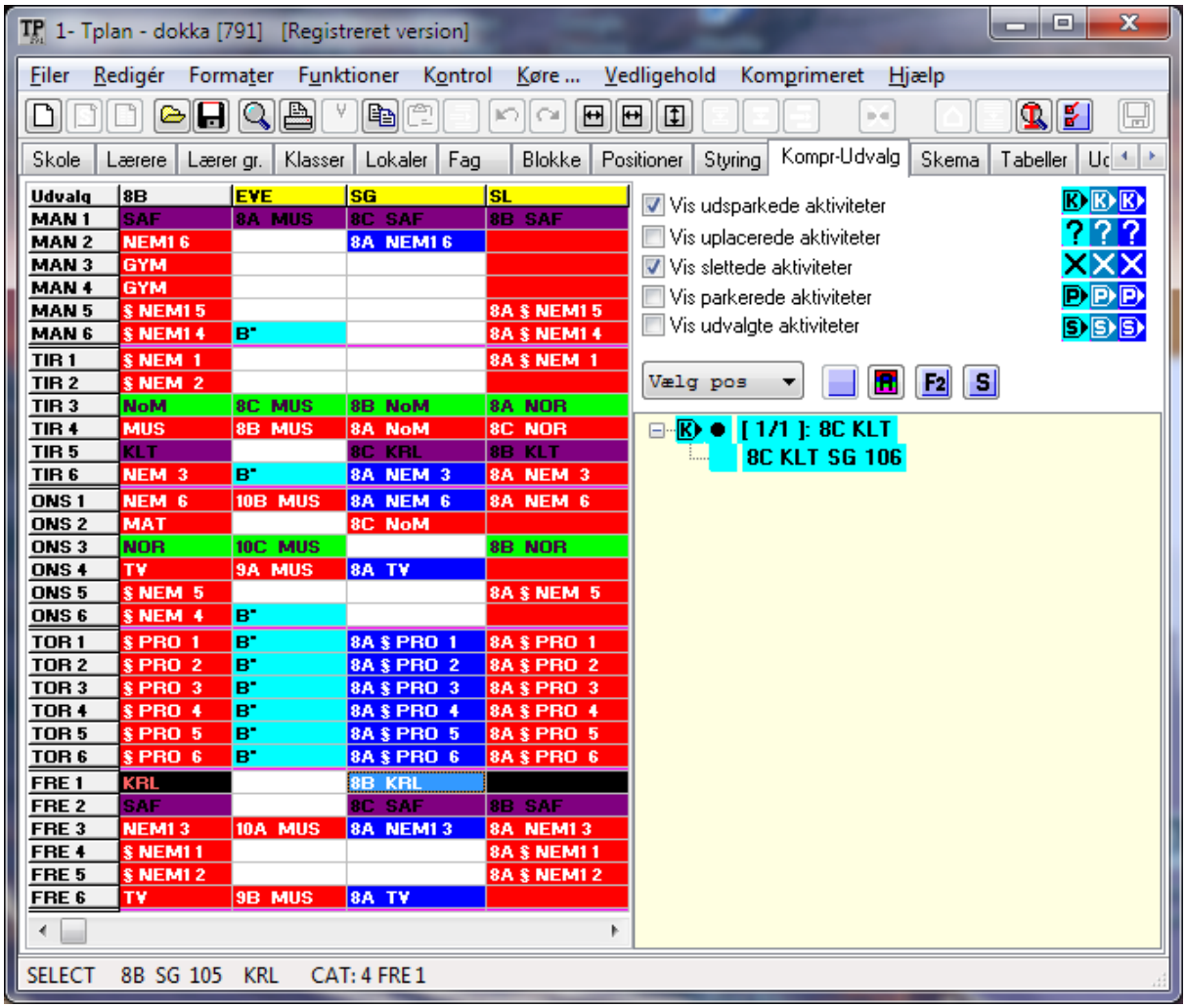
This is small infernal complex school (Look at all large blocks, large sequentials and same day-req.) We have ended up with a single pure class kickout : 8C KLT. Select that act. in kickout list and then click on P4 button just above (Use Category: Pure class). You get this selection:



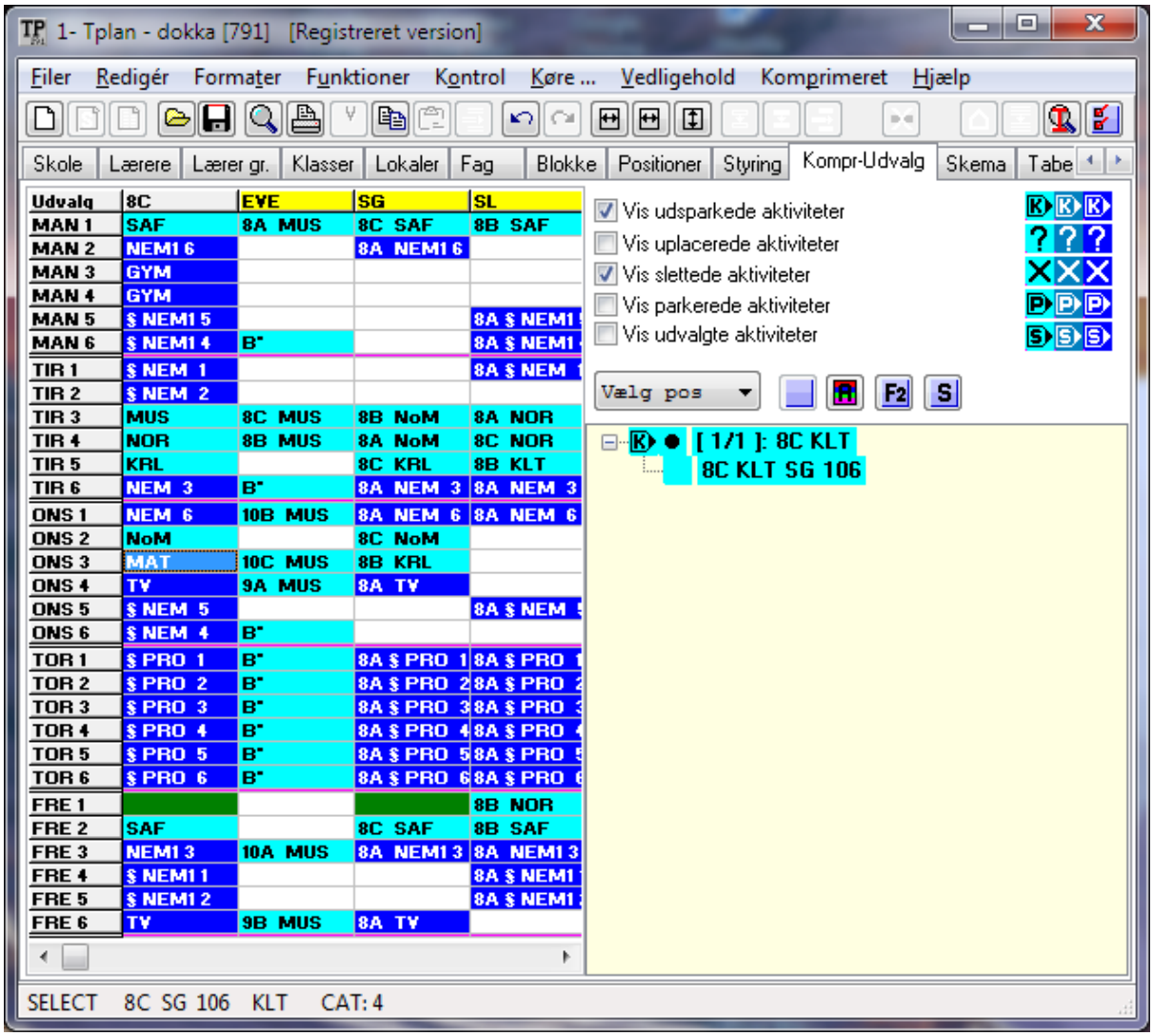
Actual teacher: SG is occupied in FRI 1 where 8C is available. Make the same selection again and use FRI 1 as actual position. You then get:



From this figure we conclude that FRI 1 may be interchanged with TUE 3 or 4. We are not much helped by that since SG is also booked in TUE 3 and 4. Next attempt is to try to get SG available in FRI 1. Click on 8B KRL in FRI 1 in above figure and use P4 again (**NB this time you use P4-button in Main Bar since you are calling P4 from a Grid).** This time you get:



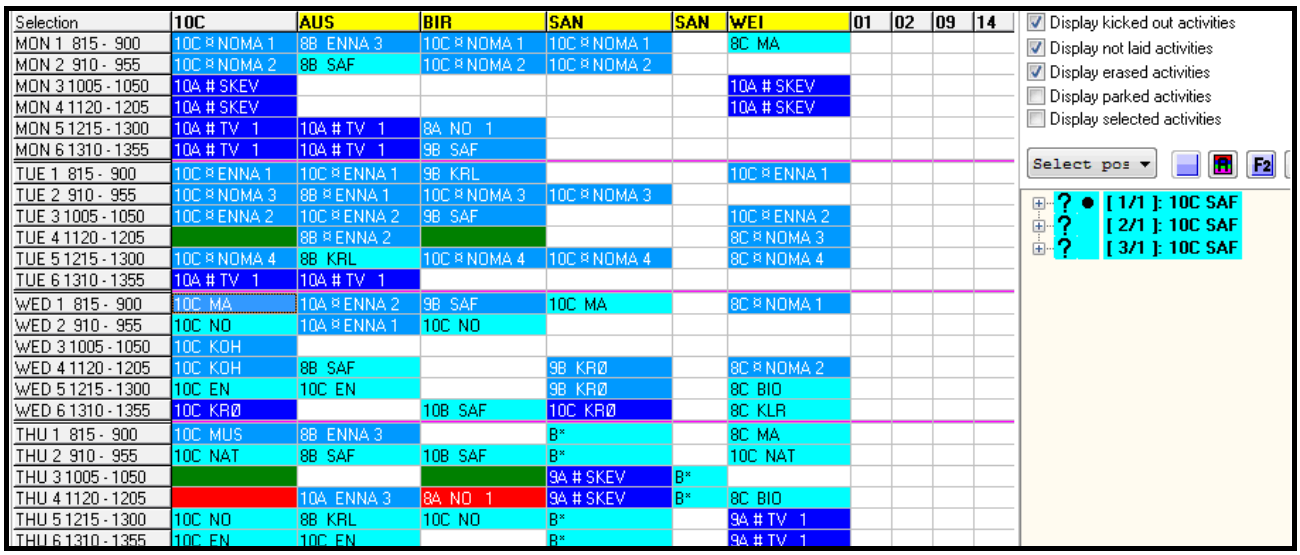
The figure above tells that 8B KRL might be interchanged with TUE 3 or WED 3. As luck will have it SG is available in WED 3. **By all means select WED 3!!!** I.e. You drag 8B KRL (for teacher SG in FRI 1) to WED 3 and drop it here. You are told that this is an Ok interchange operation. You accept and end up with:



You have a nice green colour in FRI 1 for both 8C and SG. A simple drag from kickout list and drop in FRI 1 completes the timetable. SIMPLE!

6.3.2 Example 2

This example is slightly artificial. (since Tplan on its own would never produce such a result). The starting table is like this:



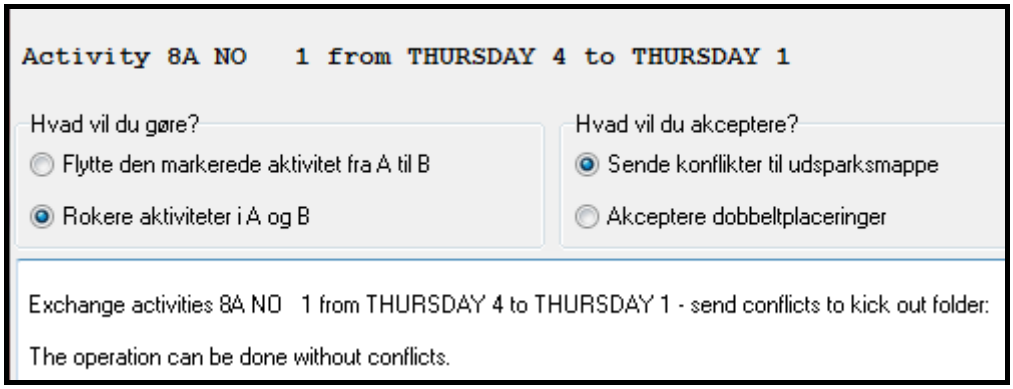
We have kickouts of 3 periods of 10C SAF (pure class). We use P4 and get nice dark green colour in TUE 4 and THU 3. Two simple drag/drops from kickout list to these periods eliminate 2 kickouts. For the remaining kickout we use P4 with THU 4 as actual position. We get:

Selection	10C	AUS	BIR	BRE	LAN	SAN	SAN	TEI	WEI	ZZ	01
MON 1 815 - 900	10C ¤ NOMA 1	8B ENNA 3	10C ¤ NOMA 1		9B KUH	10C ¤ NOMA 1		9B KUH	8C MA		
MON 2 910 - 955	10C ¤ NOMA 2	8B SAF	10C ¤ NOMA 2		9B KUH	10C ¤ NOMA 2		9B KUH			
MON 3 1005 - 1050	10A # SKEV			8B MUS				10A # SKEV	10A # SKEV		
MON 4 1120 - 1205	10A # SKEV							10A # SKEV	10A # SKEV		
MON 5 1215 - 1300	10A # TV 1	10A # TV 1	8A NO 1					10A # TV 1			
MON 6 1310 - 1355	10A # TV 1	10A # TV 1	9B SAF	8C MUS				10A # TV 1			
TUE 1 815 - 900	10C ¤ ENNA 1	10C ¤ ENNA 1	9B KRL						10C ¤ ENNA 1		
TUE 2 910 - 955	10C ¤ NOMA 3	8B ¤ ENNA 1	10C ¤ NOMA 3		8C KUH	10C ¤ NOMA 3		8C KUH			
TUE 3 1005 - 1050	10C ¤ ENNA 2	10C ¤ ENNA 2	9B SAF		8C KUH			8C KUH	10C ¤ ENNA 2		
TUE 4 1120 - 1205	10C SAF	8B ¤ ENNA 2	10C SAF	8A MUS	9A KUH			9A KUH	8C ¤ NOMA 3		
TUE 5 1215 - 1300	10C ¤ NOMA 4	8B KRL	10C ¤ NOMA 4	9C MUS	9A KUH	10C ¤ NOMA 4		9A KUH	8C ¤ NOMA 4		
TUE 6 1310 - 1355	10A # TV 1	10A # TV 1		9A MUS				10A # TV 1			
WED 1 815 - 900	10C MA	10A ¤ ENNA 2	9B SAF		9C KUH	10C MA		9C KUH	8C ¤ NOMA 1		
WED 2 910 - 955	10C NO	10A ¤ ENNA 1	10C NO	9B MUS	9C KUH			9C KUH			
WED 3 1005 - 1050	10C KOH				10C KOH			10C KOH			
WED 4 1120 - 1205	10C KOH	8B SAF			10C KOH	9B KRØ		10C KOH	8C ¤ NOMA 2		
WED 5 1215 - 1300	10C EN	10C EN			8B KUH	9B KRØ		8B KUH	8C BIO		
WED 6 1310 - 1355	10C KRØ		10B SAF		8B KUH	10C KRØ		8B KUH	8C KLR		
THU 1 815 - 900	10C MUS	8B ENNA 3		10C MUS	10A KOH	B*		10A KOH	8C MA	10C MUS	
THU 2 910 - 955	10C NAT	8B SAF	10B SAF		10A KOH	B*		10A KOH	10C NAT		
THU 3 1005 - 1050	10C SAF		10C SAF		9A # SKEV	9A # SKEV	B*				
THU 4 1120 - 1205		10A ENNA 3	8A NO 1	10B MUS	9A # SKEV	9A # SKEV	B*		8C BIO	10B MUS	
THU 5 1215 - 1300	10C NO	8B KRL	10C NO		9A # TV 1	B*			9A # TV 1		
THU 6 1310 - 1355	10C EN	10C EN			9A # TV 1	B*			9A # TV 1		
FRI 1 815 - 900	10C KRØ		10B SAF		9A # TV 1	10C KRØ			9A # TV 1		
FRI 2 910 - 955	10C KRØ	8B SAF	8A NO 1		10B KOH	10C KRØ		10B KOH	8C ¤ ENNA 2		
FRI 3 1005 - 1050	10C MA			10A MUS	10B KOH	10C MA		10B KOH		10A MUS	
FRI 4 1120 - 1205	10C NO	10A ENNA 3	10C NO		8A KUH			8A KUH			
FRI 5 1215 - 1300	10C KRL		10C KRL		8A KUH	9C KRØ		8A KUH	8C ¤ ENNA 1		
FRI 6 1310 - 1355	10C NAT					9C KRØ			10C NAT		

There is currently no possibility of making BIR available in THU 4. Next attempt is to try to get BIR available in this period. Click on BIR in THU 4 and make a P4 (**Again: Main bar here)**. We get this result:

Selection	8A	BIR	BRE	LEN	KLU	LAN	NØR	SOL	TEI
MON 1 815 - 900	8A SAF	10C ¤ NOMA 1		8A SAF	8A SAF	9B KUH		10A KRØ	9B KUH
MON 2 910 - 955	8A MA	10C ¤ NOMA 2				9B KUH	8A MA		9B KUH
MON 3 1005 - 1050	8A KRØ		8B MUS				8A KRØ	8A KRØ	10A # SKEV
MON 4 1120 - 1205	8A KRØ				9A NOMA 3		8A KRØ	8A KRØ	10A # SKEV
MON 5 1215 - 1300	8A NO 1	8A NO 1		8A NO 1				8B KRØ	10A # TV 1
MON 6 1310 - 1355	8A KRL	9B SAF	8C MUS	8A KRL	9B SAF			8B KRØ	10A # TV 1
TUE 1 815 - 900	8A TV 1	9B KRL		8A TV 1	9B KRL			10A NAT	
TUE 2 910 - 955	8A ¤ NOMA 1	10C ¤ NOMA 3		8A ¤ NOMA 1		8C KUH	8A ¤ NOMA 1		8C KUH
TUE 3 1005 - 1050	8A ¤ NOMA 2	9B SAF		8A ¤ NOMA 2	9B SAF	8C KUH	8A ¤ NOMA 2		8C KUH
TUE 4 1120 - 1205	8A MUS	10C SAF	8A MUS	9C NAEN 3	9B § HKNM 1	9A KUH		10A NOMA 5	9A KUH
TUE 5 1215 - 1300	8A ¤ ENNA 1	10C ¤ NOMA 4	9C MUS	8A ¤ ENNA 1	9B § HKNM 1	9A KUH	8A ¤ ENNA 1	10A SAF 3	9A KUH
TUE 6 1310 - 1355	8A ¤ ENNA 2		9A MUS	8A ¤ ENNA 2			8A ¤ ENNA 2		10A # TV 1
WED 1 815 - 900	8A ¤ NOMA 3	9B SAF		8A ¤ NOMA 3	9B SAF	9C KUH	8A ¤ NOMA 3	10A ¤ ENNA 2	9C KUH
WED 2 910 - 955	8A ¤ NOMA 4	10C NO	9B MUS	8A ¤ NOMA 4		9C KUH	8A ¤ NOMA 4	10A ¤ ENNA 1	9C KUH
WED 3 1005 - 1050	8A BIO			9C NAEN 3		10C KOH	8A BIO	10A ¤ NOMA 1	10C KOH
WED 4 1120 - 1205	8A SAF			8A SAF	8A SAF	10C KOH		10A KRØ	10C KOH
WED 5 1215 - 1300	8A KRL			8A KRL		8B KUH		10A KRØ	8B KUH
WED 6 1310 - 1355	8A EN	10B SAF		8A EN		8B KUH	10C KRØ	10A ¤ NOMA 2	8B KUH
THU 1 815 - 900	8A MA		10C MUS		9A ¤ NOMA 1	10A KOH	8A MA		10A KOH
THU 2 910 - 955	8A EN	10B SAF		8A EN	9A ¤ NOMA 2	10A KOH			10A KOH
THU 3 1005 - 1050	8A SAF	10C SAF		8A SAF	8A SAF	9A # SKEV		10A NOMA 5	
THU 4 1120 - 1205	8A NO 1	8A NO 1	10B MUS	8A NO 1		9A # SKEV			
THU 5 1215 - 1300	8A BIO	10C NO				9A # TV 1	8A BIO		
THU 6 1310 - 1355	8A KLR					9A # TV 1	8A KLR	10A SAF 1	
FRI 1 815 - 900	8A SAF	10B SAF		8A SAF	8A SAF	9A # TV 1	10C KRØ	10A ¤ NOMA 3	
FRI 2 910 - 955	8A NO 1	8A NO 1		8A NO 1		10B KOH	10C KRØ	10A ¤ NOMA 4	10B KOH
FRI 3 1005 - 1050	8A KRØ1		10A MUS	9C ¤ NAEN 1		10B KOH	8A KRØ1	8A KRØ1	10B KOH
FRI 4 1120 - 1205	8A KUH	10C NO		9C ¤ NAEN 2		8A KUH		8B KRØ1	8A KUH
FRI 5 1215 - 1300	8A KUH	10C KRL			9B § HKNM 4	8A KUH	9A KRØ	10A SAF 1	8A KUH
FRI 6 1310 - 1355	8A TV 1			8A TV 1	9B § HKNM 4		9A KRØ	10A NAT	

From this figure we see THU 1 may be interchanged with THU 4 and BIR is **currently available in THU 1.** We do this drag/drop and get this message:

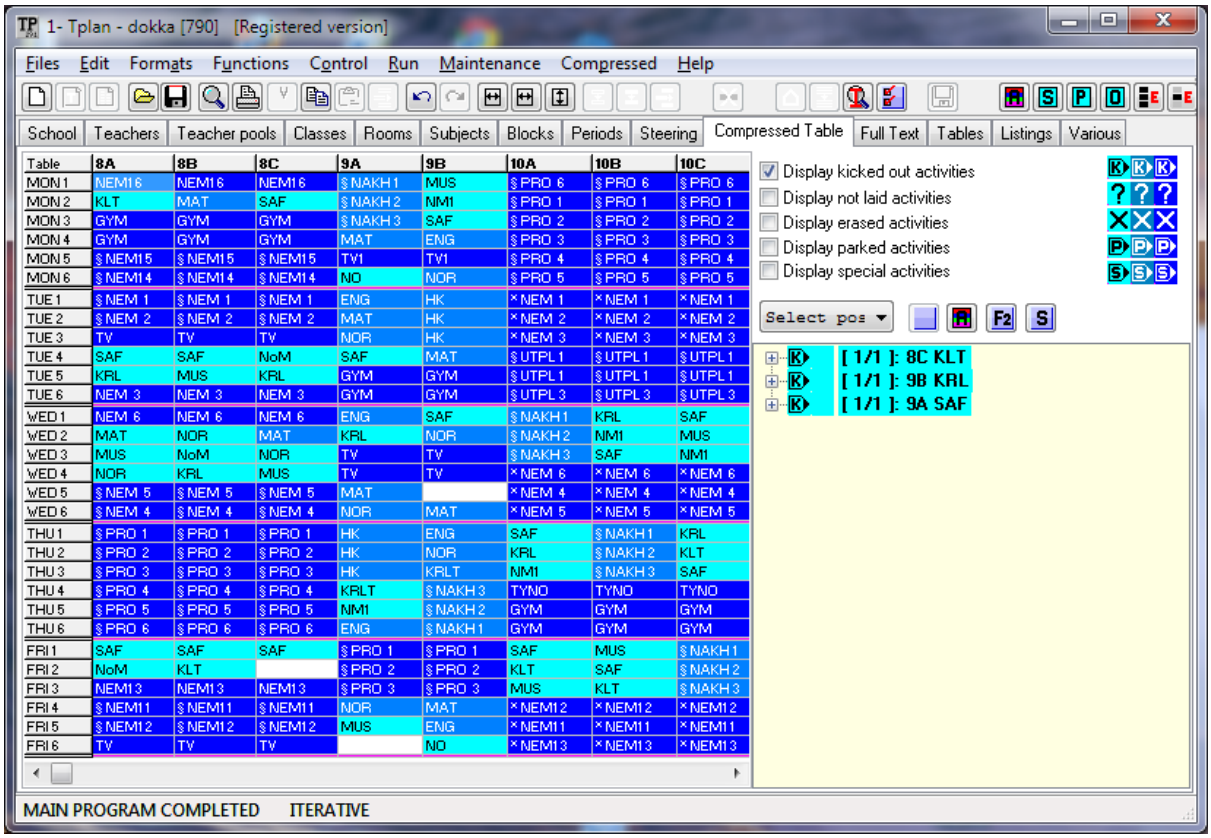


We accept that. Then we drag the last 10C SAF from kickout list to THU 4 and end up with:
PROBLEM SOLVED

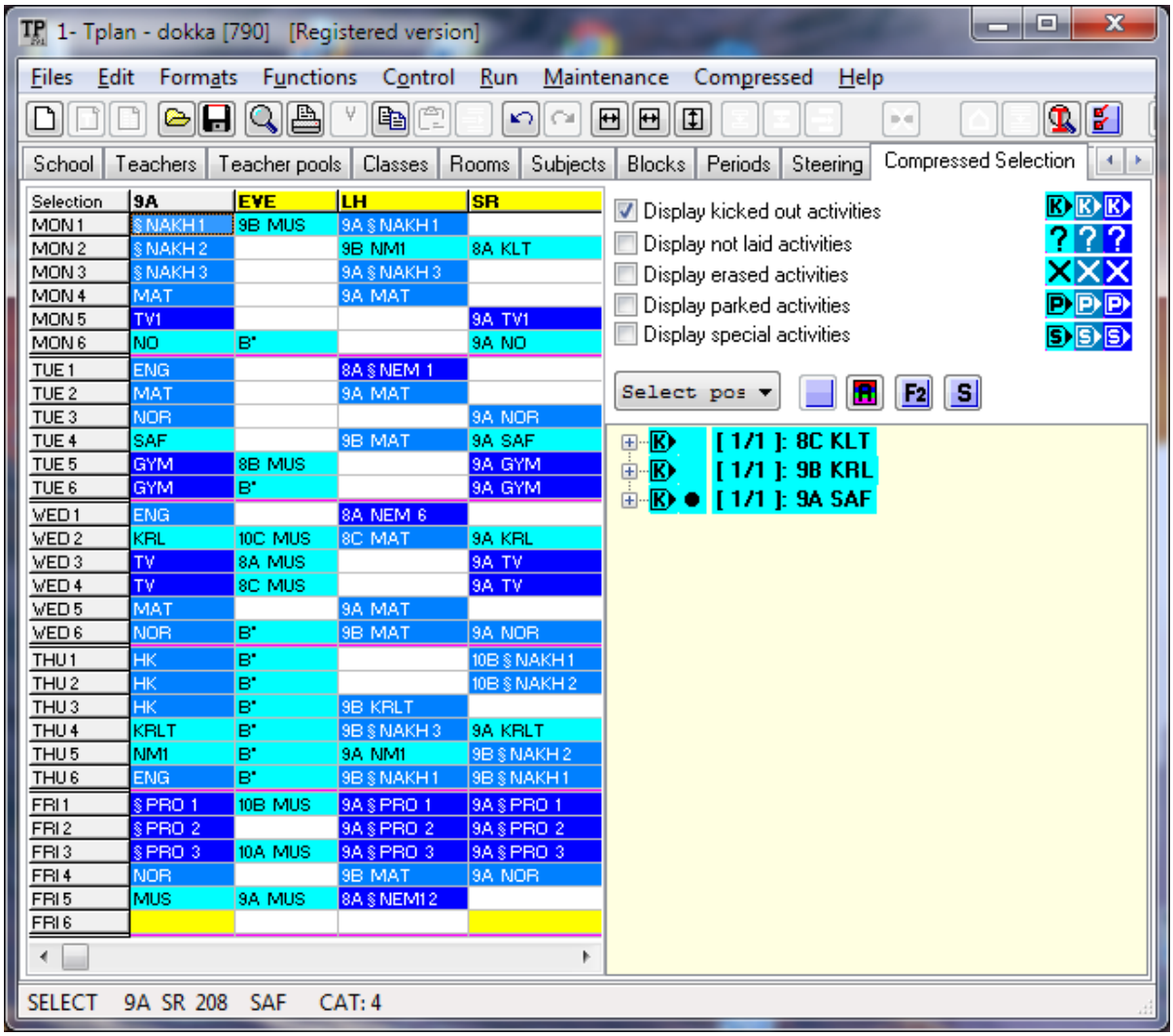
Selection	8A	BIR	BRE	LEN	KLU	LAN	NØR	SOL	TEI
MON 1 815 - 900	8A SAF	10C ¤ NOMA 1		8A SAF	8A SAF	9B KUH		10A KRØ	9B KUH
MON 2 910 - 955	8A MA	10C ¤ NOMA 2				9B KUH	8A MA		9B KUH
MON 3 1005 - 1050	8A KRØ		8B MUS				8A KRØ	8A KRØ	10A # SKEV
MON 4 1120 - 1205	8A KRØ				9A NOMA 3		8A KRØ	8A KRØ	10A # SKEV
MON 5 1215 - 1300	8A NO 1	8A NO 1		8A NO 1				8B KRØ	10A # TV 1
MON 6 1310 - 1355	8A KRL	9B SAF	8C MUS	8A KRL	9B SAF			8B KRØ	10A # TV 1
TUE 1 815 - 900	8A TV 1	9B KRL		8A TV 1	9B KRL			10A NAT	
TUE 2 910 - 955	8A ¤ NOMA 1	10C ¤ NOMA 3		8A ¤ NOMA 1		8C KUH	8A ¤ NOMA 1		8C KUH
TUE 3 1005 - 1050	8A ¤ NOMA 2	9B SAF		8A ¤ NOMA 2	9B SAF	8C KUH	8A ¤ NOMA 2		8C KUH
TUE 4 1120 1205	8A MUS	10C SAF	8A MUS	9C NAEN 3	9B § HKNM 1	9A KUH		10A NOMA 5	9A KUH
TUE 5 1215 - 1300	8A ¤ ENNA 1	10C ¤ NOMA 4	9C MUS	8A ¤ ENNA 1	9B § HKNM 1	9A KUH	8A ¤ ENNA 1	10A SAF 3	9A KUH
TUE 6 1310 - 1355	8A ¤ ENNA 2		9A MUS	8A ¤ ENNA 2			8A ¤ ENNA 2		10A # TV 1
WED 1 815 - 900	8A ¤ NOMA 3	9B SAF		8A ¤ NOMA 3	9B SAF	9C KUH	8A ¤ NOMA 3	10A ¤ ENNA 2	9C KUH
WED 2 910 - 955	8A ¤ NOMA 4	10C NO	9B MUS	8A ¤ NOMA 4		9C KUH	8A ¤ NOMA 4	10A ¤ ENNA 1	9C KUH
WED 3 1005 - 1050	8A BIO			9C NAEN 3		10C KOH	8A BIO	10A ¤ NOMA 1	10C KOH
WED 4 1120 - 1205	8A SAF			8A SAF	8A SAF	10C KOH		10A KRØ	10C KOH
WED 5 1215 - 1300	8A KRL			8A KRL		8B KUH		10A KRØ	8B KUH
WED 6 1310 - 1355	8A EN	10B SAF		8A EN		8B KUH	10C KRØ	10A ¤ NOMA 2	8B KUH
THU 1 815 - 900	8A NO 1	8A NO 1	10C MUS	8A NO 1	9A ¤ NOMA 1	10A KOH			10A KOH
THU 2 910 - 955	8A EN	10B SAF		8A EN	9A ¤ NOMA 2	10A KOH			10A KOH
THU 3 1005 - 1050	8A SAF	10C SAF		8A SAF	8A SAF	9A # SKEV		10A NOMA 5	
THU 4 1120 - 1205	8A MA	10C SAF	10B MUS			9A # SKEV	8A MA		
THU 5 1215 - 1300	8A BIO	10C NO				9A # TV 1	8A BIO		
THU 6 1310 - 1355	8A KLR					9A # TV 1	8A KLR	10A SAF 1	
FRI 1 815 - 900	8A SAF	10B SAF		8A SAF	8A SAF	9A # TV 1	10C KRØ	10A ¤ NOMA 3	
FRI 2 910 - 955	8A NO 1	8A NO 1		8A NO 1		10B KOH	10C KRØ	10A ¤ NOMA 4	10B KOH
FRI 3 1005 - 1050	8A KRØ1		10A MUS	9C ¤ NAEN 1		10B KOH	8A KRØ1	8A KRØ1	10B KOH
FRI 4 1120 - 1205	8A KUH	10C NO		9C ¤ NAEN 2		8A KUH		8B KRØ1	8A KUH
FRI 5 1215 1300	8A KUH	10C KRL			9B § HKNM 4	8A KUH	9A KRØ	10A SAF 1	8A KUH
FRI 6 1310 - 1355	8A TV 1			8A TV 1	9B § HKNM 4		9A KRØ	10A NAT	

6.3.3 Example 3

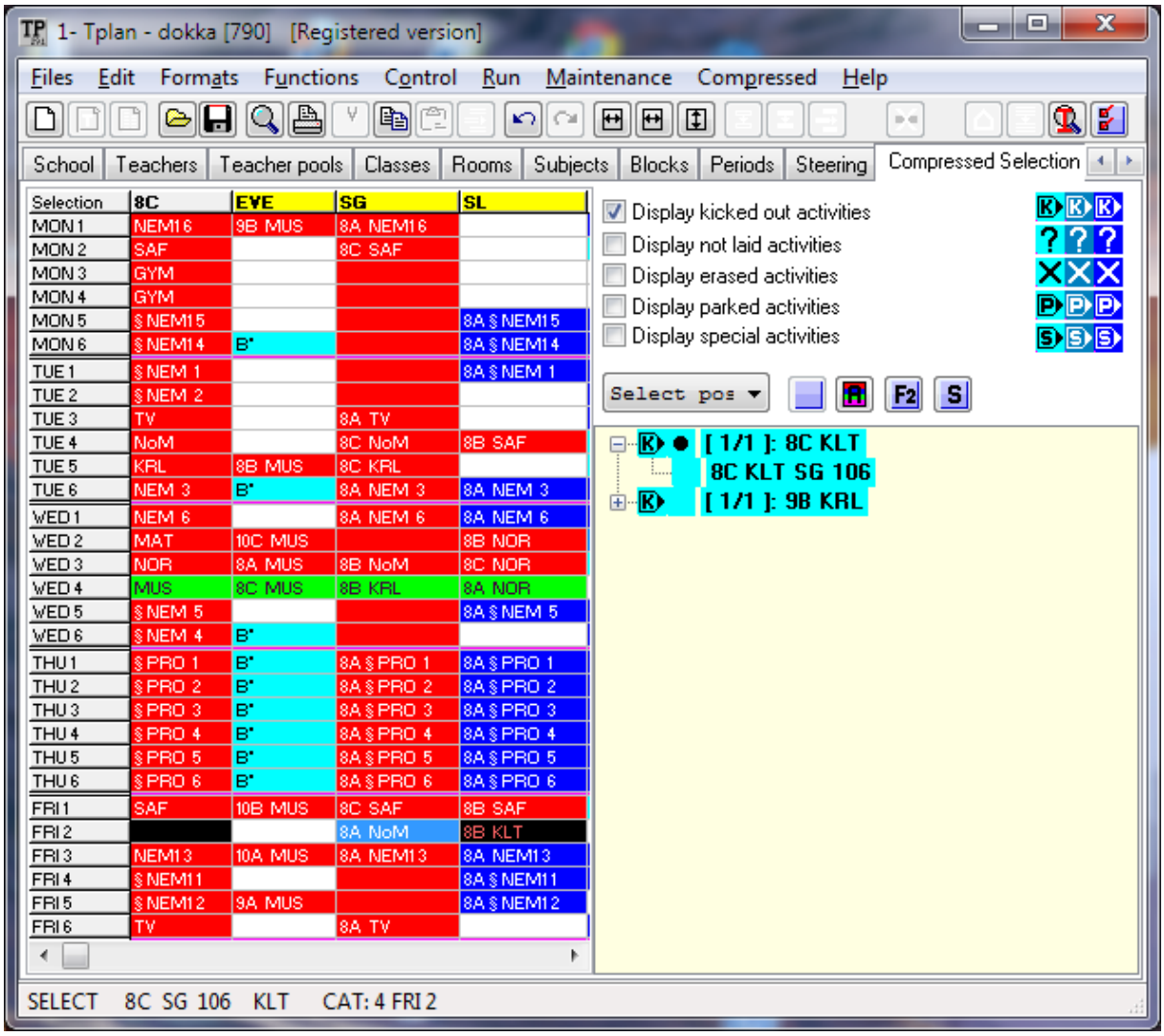
This is the same school as example 1, but the starting point is slightly more complicated:



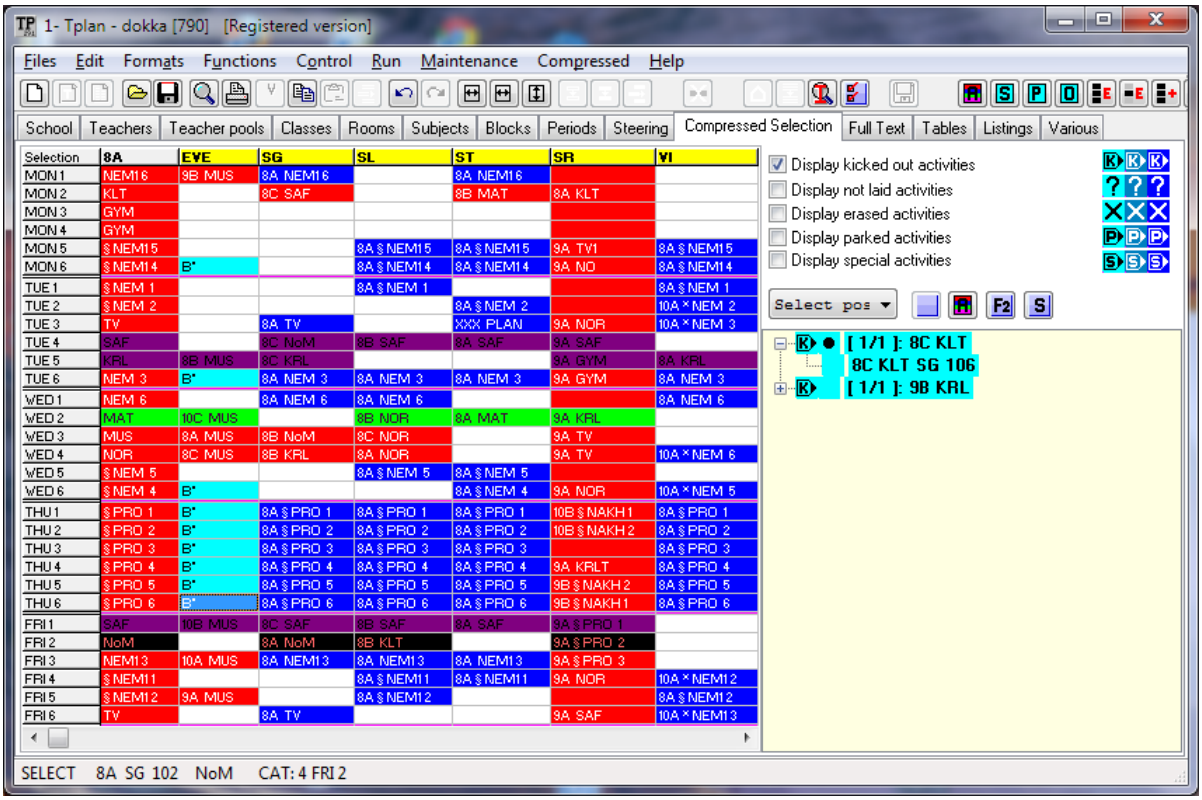
This time we have 3 kickouts of pure class singles. I **prefer always to start with the most complicated problem** but in my presentation here I start with the simplest problem. I start with 9A SAF and use P4 to get this selection:



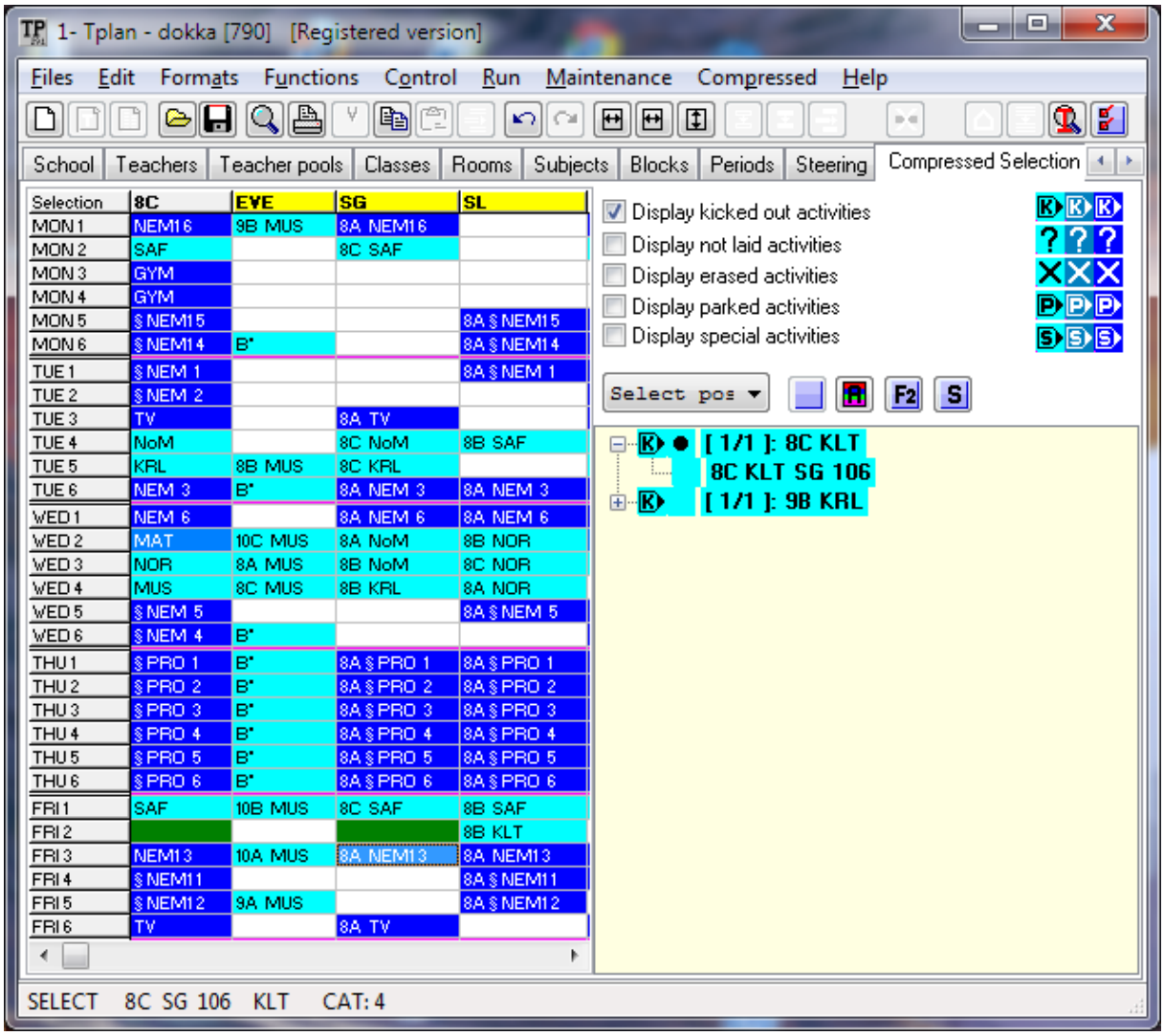
This case is simple: 9A SAF may directly be assigned to FRI 6, but you are then breaking a day conflict. Looks peculiar, but investigating the block in 3 first periods on FRI includes a single per SAF. This is a minor compromise. We drag 9A SAF from kickout list to FRI 6 and drop it. Everything is ok. Next case is:



We work with 8C KLT (teacher SG) and uses FRI 2 as actual pos. We see that we may interchange FRI 2 with WED 4. We are not much helped by that since SG is booked in WED 4. Our next attempt is to try to free SG in FRI 2. We select 8A NoM in FRI 2 and get this:

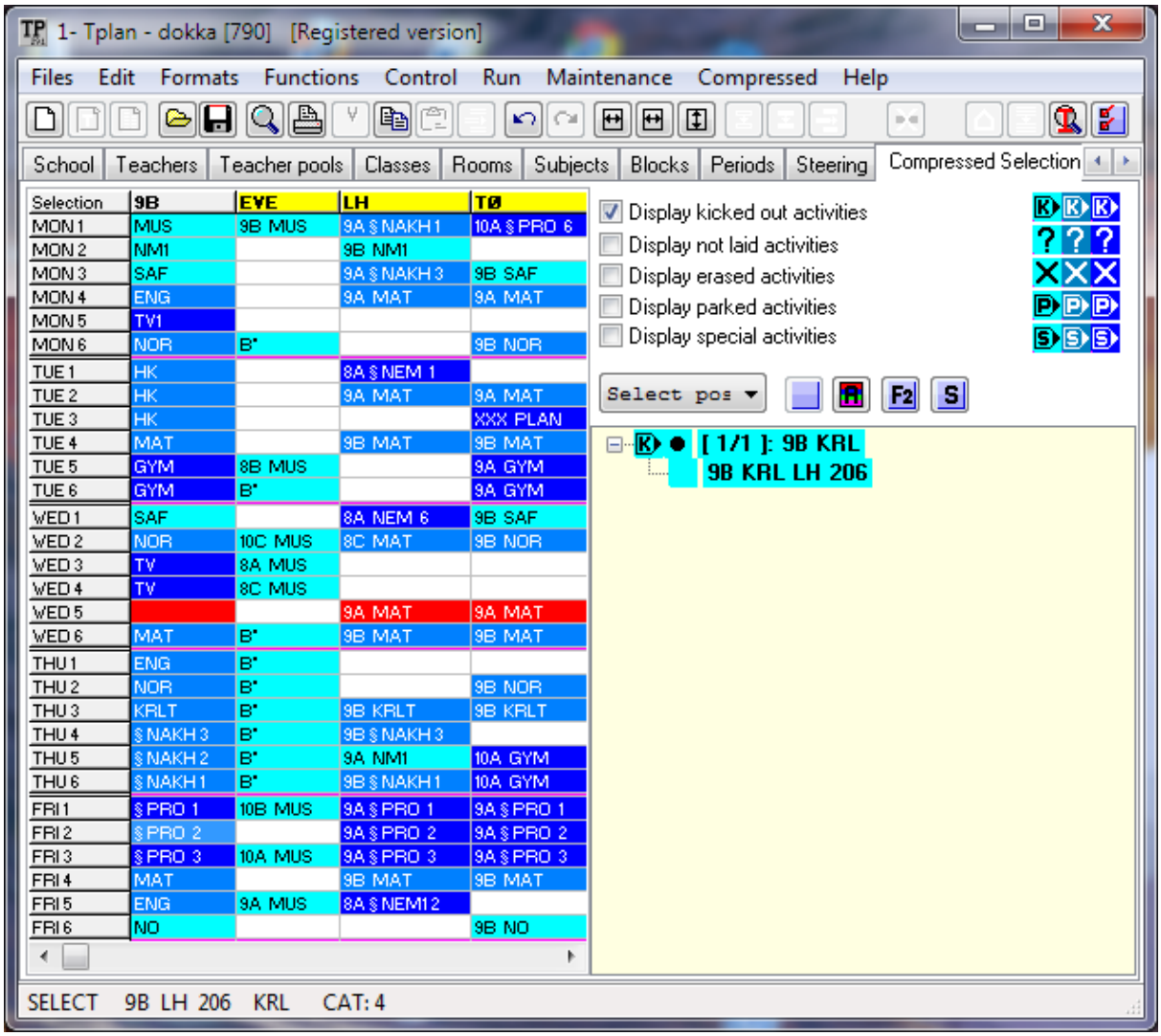


We see that FRI 2 may be interchanged with WED 2 and we accept this interchange and get this new situation:



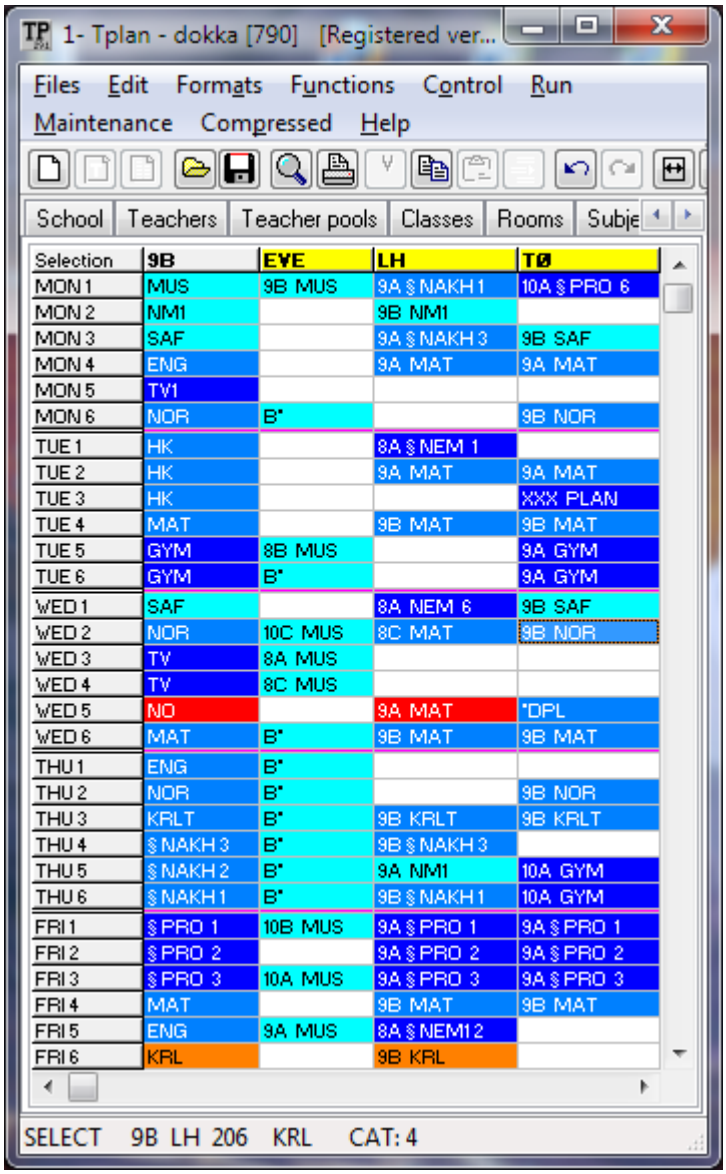
We have a nice dark green colour in FRI 2. Simple to drag 8C KLT from kickout list to FRI 2.

The last problem looks like this:



Selection	9B	EVE	LH	TØ
MON 1	MUS	9B MUS	9A § NAKH 1	10A § PRO 6
MON 2	NM1		9B NM1	
MON 3	SAF		9A § NAKH 3	9B SAF
MON 4	ENG		9A MAT	9A MAT
MON 5	TV1			
MON 6	NOR	B*		9B NOR
TUE 1	HK		8A § NEM 1	
TUE 2	HK		9A MAT	9A MAT
TUE 3	HK			XXX PLAN
TUE 4	MAT		9B MAT	9B MAT
TUE 5	GYM	8B MUS		9A GYM
TUE 6	GYM	B*		9A GYM
WED 1	SAF		8A NEM 6	9B SAF
WED 2	NOR	10C MUS	8C MAT	9B NOR
WED 3	TV	8A MUS		
WED 4	TV	8C MUS		
WED 5			9A MAT	9A MAT
WED 6	MAT	B*	9B MAT	9B MAT
THU 1	ENG	B*		
THU 2	NOR	B*		9B NOR
THU 3	KRLT	B*	9B KRLT	9B KRLT
THU 4	§ NAKH 3	B*	9B § NAKH 3	
THU 5	§ NAKH 2	B*	9A NM1	10A GYM
THU 6	§ NAKH 1	B*	9B § NAKH 1	10A GYM
FRI 1	§ PRO 1	10B MUS	9A § PRO 1	9A § PRO 1
FRI 2	§ PRO 2		9A § PRO 2	9A § PRO 2
FRI 3	§ PRO 3	10A MUS	9A § PRO 3	9A § PRO 3
FRI 4	MAT		9B MAT	9B MAT
FRI 5	ENG	9A MUS	8A § NEM 2	
FRI 6	NO			9B NO

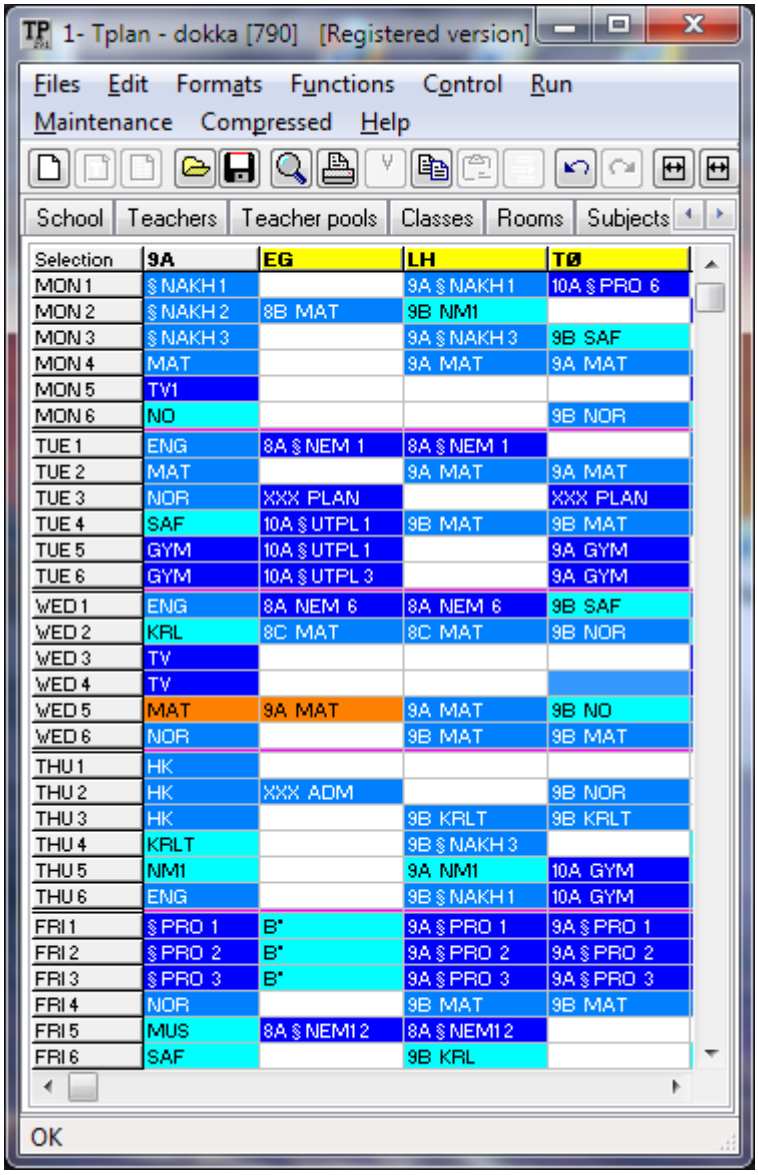
The problematic period is WED 5 with teachers LH and TØ. LH is the main teacher in MAT while TØ is a support teacher. The interchange possibilities are minimal: EVE may move from MON 1 to WED 5. Not much help in that since MON 1 is problematic for both LH and TØ. FRI 6 is the last sensible possibility since LH (the most important teacher) is available here. A solution is then: Drag 9B NO from FRI 6 to WED 5 and accept the double assignment for teacher TØ in WED 5. 9B KRL may then be dragged from kickout list to FRI 6. We do this and get this selection:



Selection	9B	EVE	LH	TØ
MON 1	MUS	9B MUS	9A § NAKH 1	10A § PRO 6
MON 2	NM1		9B NM1	
MON 3	SAF		9A § NAKH 3	9B SAF
MON 4	ENG		9A MAT	9A MAT
MON 5	TV1			
MON 6	NOR	B*		9B NOR
TUE 1	HK		8A § NEM 1	
TUE 2	HK		9A MAT	9A MAT
TUE 3	HK			XXX PLAN
TUE 4	MAT		9B MAT	9B MAT
TUE 5	GYM	8B MUS		9A GYM
TUE 6	GYM	B*		9A GYM
WED 1	SAF		8A NEM 6	9B SAF
WED 2	NOR	10C MUS	8C MAT	9B NOR
WED 3	TV	8A MUS		
WED 4	TV	8C MUS		
WED 5	NO		9A MAT	*DPL
WED 6	MAT	B*	9B MAT	9B MAT
THU 1	ENG	B*		
THU 2	NOR	B*		9B NOR
THU 3	KRLT	B*	9B KRLT	9B KRLT
THU 4	§ NAKH 3	B*	9B § NAKH 3	
THU 5	§ NAKH 2	B*	9A NM1	10A GYM
THU 6	§ NAKH 1	B*	9B § NAKH 1	10A GYM
FRI 1	§ PRO 1	10B MUS	9A § PRO 1	9A § PRO 1
FRI 2	§ PRO 2		9A § PRO 2	9A § PRO 2
FRI 3	§ PRO 3	10A MUS	9A § PRO 3	9A § PRO 3
FRI 4	MAT		9B MAT	9B MAT
FRI 5	ENG	9A MUS	8A § NEM 2	
FRI 6	KRL		9B KRL	

Notice double assignment (*DPL) for TØ in WED 5 and we intend to let teacher EG be a substitute here. We blow up (F5) the figure above and include EG in selection. Then we drag 9A MAT from TØ to EG.

That gives:



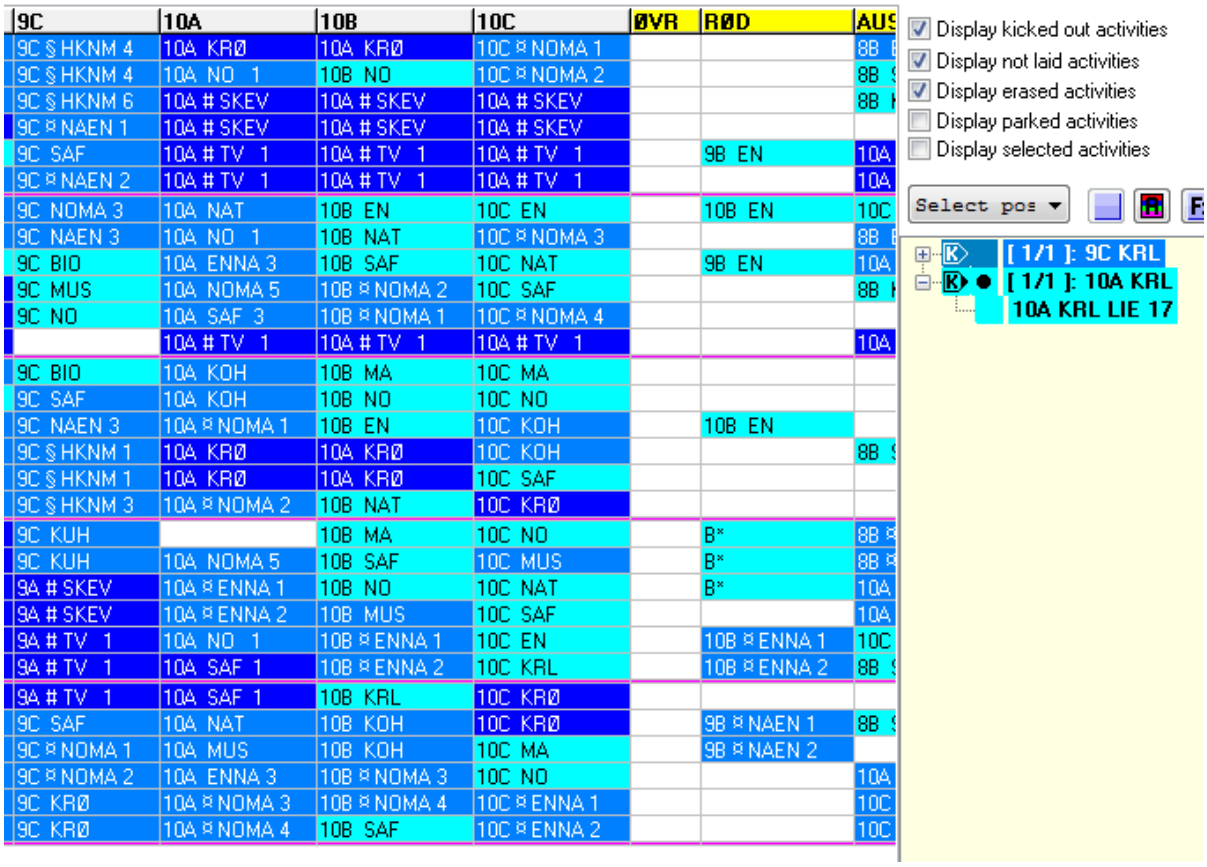
Selection	9A	EG	LH	TØ
MON 1	§ NAKH 1		9A § NAKH 1	10A § PRO 6
MON 2	§ NAKH 2	8B MAT	9B NM1	
MON 3	§ NAKH 3		9A § NAKH 3	9B SAF
MON 4	MAT		9A MAT	9A MAT
MON 5	TV1			
MON 6	NO			9B NOR
TUE 1	ENG	8A § NEM 1	8A § NEM 1	
TUE 2	MAT		9A MAT	9A MAT
TUE 3	NOR	XXX PLAN		XXX PLAN
TUE 4	SAF	10A § UTPL 1	9B MAT	9B MAT
TUE 5	GYM	10A § UTPL 1		9A GYM
TUE 6	GYM	10A § UTPL 3		9A GYM
WED 1	ENG	8A NEM 6	8A NEM 6	9B SAF
WED 2	KRL	8C MAT	8C MAT	9B NOR
WED 3	TV			
WED 4	TV			
WED 5	MAT	9A MAT	9A MAT	9B NO
WED 6	NOR		9B MAT	9B MAT
THU 1	HK			
THU 2	HK	XXX ADM		9B NOR
THU 3	HK		9B KRLT	9B KRLT
THU 4	KRLT		9B § NAKH 3	
THU 5	NM1		9A NM1	10A GYM
THU 6	ENG		9B § NAKH 1	10A GYM
FRI 1	§ PRO 1	B*	9A § PRO 1	9A § PRO 1
FRI 2	§ PRO 2	B*	9A § PRO 2	9A § PRO 2
FRI 3	§ PRO 3	B*	9A § PRO 3	9A § PRO 3
FRI 4	NOR		9B MAT	9B MAT
FRI 5	MUS	8A § NEM 1 2	8A § NEM 1 2	
FRI 6	SAF		9B KRL	

TIMETABLE COMPLETED!

(With a few minor compromises.)

6.3.4 Example 4

The results from a main run look like this:



9C	10A	10B	10C	ØVR	RØD	AUS
9C § HKNM 4	10A KRØ	10A KRØ	10C ¤ NOMA 1			8B
9C § HKNM 4	10A NO 1	10B NO	10C ¤ NOMA 2			8B
9C § HKNM 6	10A # SKEV	10A # SKEV	10A # SKEV			8B
9C ¤ NAEN 1	10A # SKEV	10A # SKEV	10A # SKEV			
9C SAF	10A # TV 1	10A # TV 1	10A # TV 1		9B EN	10A
9C ¤ NAEN 2	10A # TV 1	10A # TV 1	10A # TV 1			10A
9C NOMA 3	10A NAT	10B EN	10C EN		10B EN	10C
9C NAEN 3	10A NO 1	10B NAT	10C ¤ NOMA 3			8B
9C BIO	10A ENNA 3	10B SAF	10C NAT		9B EN	10A
9C MUS	10A NOMA 5	10B ¤ NOMA 2	10C SAF			8B
9C NO	10A SAF 3	10B ¤ NOMA 1	10C ¤ NOMA 4			
	10A # TV 1	10A # TV 1	10A # TV 1			10A
9C BIO	10A KOH	10B MA	10C MA			
9C SAF	10A KOH	10B NO	10C NO			
9C NAEN 3	10A ¤ NOMA 1	10B EN	10C KOH		10B EN	
9C § HKNM 1	10A KRØ	10A KRØ	10C KOH			8B
9C § HKNM 1	10A KRØ	10A KRØ	10C SAF			
9C § HKNM 3	10A ¤ NOMA 2	10B NAT	10C KRØ			
9C KUH		10B MA	10C NO		B*	8B
9C KUH	10A NOMA 5	10B SAF	10C MUS		B*	8B
9A # SKEV	10A ¤ ENNA 1	10B NO	10C NAT		B*	10A
9A # SKEV	10A ¤ ENNA 2	10B MUS	10C SAF			10A
9A # TV 1	10A NO 1	10B ¤ ENNA 1	10C EN		10B ¤ ENNA 1	10C
9A # TV 1	10A SAF 1	10B ¤ ENNA 2	10C KRL		10B ¤ ENNA 2	8B
9A # TV 1	10A SAF 1	10B KRL	10C KRØ			
9C SAF	10A NAT	10B KOH	10C KRØ		9B ¤ NAEN 1	8B
9C ¤ NOMA 1	10A MUS	10B KOH	10C MA		9B ¤ NAEN 2	
9C ¤ NOMA 2	10A ENNA 3	10B ¤ NOMA 3	10C NO			10A
9C KRØ	10A ¤ NOMA 3	10B ¤ NOMA 4	10C ¤ ENNA 1			10C
9C KRØ	10A ¤ NOMA 4	10B SAF	10C ¤ ENNA 2			10C

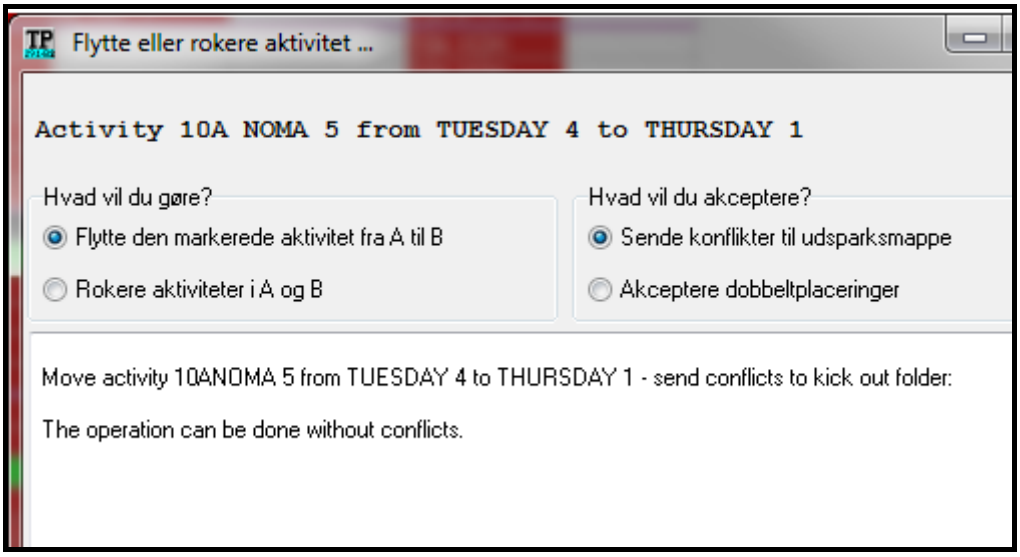
We start with adjusting 10A KRL, use P4 and gets this selection:

Selection	10A	LIE
MON 1 815 - 900	10A KRØ	10A KRØ
MON 2 910 - 955	10A NO 1	10A NO 1
MON 3 1005 - 1050	10A # SKEV	
MON 4 1120 - 1205	10A # SKEV	
MON 5 1215 - 1300	10A # TV 1	8C KRØ1
MON 6 1310 - 1355	10A # TV 1	
TUE 1 815 - 900	10A NAT	10A NAT
TUE 2 910 - 955	10A NO 1	10A NO 1
TUE 3 1005 - 1050	10A ENNA 3	
TUE 4 1120 - 1205	10A NOMA 5	
TUE 5 1215 - 1300	10A SAF 3	
TUE 6 1310 - 1355	10A # TV 1	
WED 1 815 - 900	10A KOH	10A KOH
WED 2 910 - 955	10A KOH	10A KOH
WED 3 1005 - 1050	10A ¤ NOMA 1	10A ¤ NOMA 1
WED 4 1120 - 1205	10A KRØ	10A KRØ
WED 5 1215 - 1300	10A KRØ	10A KRØ
WED 6 1310 - 1355	10A ¤ NOMA 2	10A ¤ NOMA 2
THU 1 815 - 900		9C KUH
THU 2 910 - 955	10A NOMA 5	9C KUH
THU 3 1005 - 1050	10A ¤ ENNA 1	
THU 4 1120 - 1205	10A ¤ ENNA 2	
THU 5 1215 - 1300	10A NO 1	10A NO 1
THU 6 1310 - 1355	10A SAF 1	10A SAF 1
FRI 1 815 - 900	10A SAF 1	10A SAF 1
FRI 2 910 - 955	10A NAT	10A NAT
FRI 3 1005 - 1050	10A MUS	8C KRØ
FRI 4 1120 - 1205	10A ENNA 3	8C KRØ
FRI 5 1215 - 1300	10A ¤ NOMA 3	10A ¤ NOMA 3
FRI 6 1310 - 1355	10A ¤ NOMA 4	10A ¤ NOMA 4

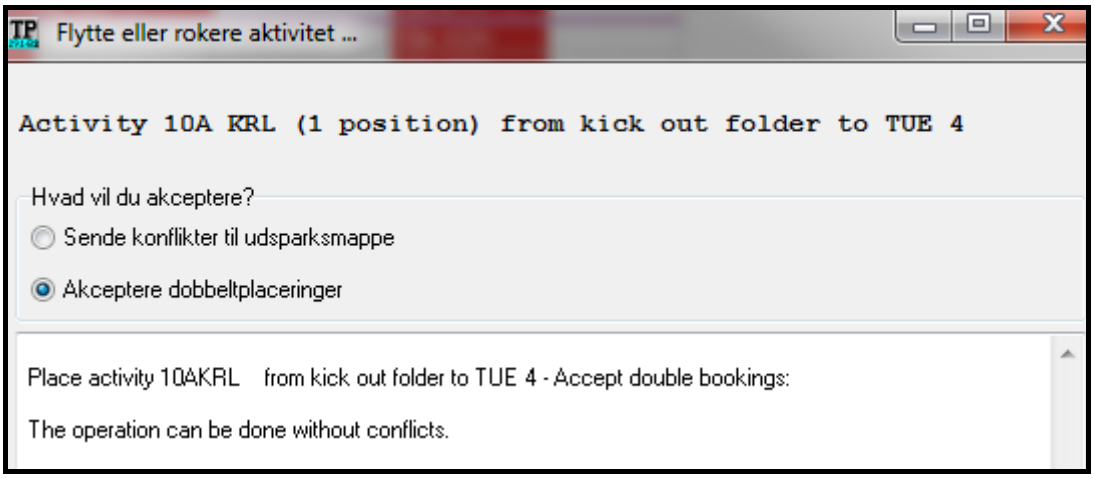
We use P4 once more with THU 1 as actual period (Category= Small parallels)

10A	AUS	BRE	BRY	JOH	LAN	LIE	LUN	SOL
10A KRØ	8B ENNA 3				9B KUH	10A KRØ		10A KRØ
10A NO 1	8B SAF		10A NO 1		9B KUH	10A NO 1		
10A # SKEV	8B KRL			10A # SKEV				8A KRØ
10A # SKEV			9A NOMA 3	10A # SKEV			8B NO 1	8A KRØ
10A # TV 1	10A # TV 1		9C SAF	8C KRØ1		8C KRØ1		8B KRØ
10A # TV 1	10A # TV 1		9B NOMA 5					8B KRØ
10A NAT	10C EN		8A TV 1	9A § HKNM 1		10A NAT		10A NAT
10A NO 1	8B ENNA 3		10A NO 1	9A § HKNM 1	8C KUH	10A NO 1		
10A ENNA 3	10A ENNA 3		10A ENNA 3	9A § HKNM 3	8C KUH			
10A NOMA 5	8B KRL	9C MUS	9B § HKNM 1	10A NOMA 5	9A KUH		10A NOMA 5	10A NOMA 5
10A SAF 3			9B § HKNM 1	10A SAF 3	9A KUH			10A SAF 3
10A # TV 1	10A # TV 1	9A MUS	9B § HKNM 3				8B NO 1	
10A KOH				9A § HKNM 6	10A KOH	10A KOH		
10A KOH		9B MUS	9C SAF	9A § HKNM 4	10A KOH	10A KOH		
10A ¤ NOMA 1			10A ¤ NOMA 1	9A § HKNM 4	10C KOH	10A ¤ NOMA 1		10A ¤ NOMA 1
10A KRØ	8B SAF				10C KOH	10A KRØ		10A KRØ
10A KRØ					8B KUH	10A KRØ		10A KRØ
10A ¤ NOMA 2				10C KRØ	8B KUH	10A ¤ NOMA 2	10A ¤ NOMA 2	10A ¤ NOMA 2
	8B ¤ ENNA 1		9A ¤ NOMA 1		9C KUH	9C KUH		
10A NOMA 5	8B ¤ ENNA 2	10C MUS	9A ¤ NOMA 2	10A NOMA 5	9C KUH	9C KUH	10A NOMA 5	10A NOMA 5
10A ¤ ENNA 1	10A ¤ ENNA 1		10A ¤ ENNA 1		9A # SKEV		8B NO 1	10A ¤ ENNA 1
10A ¤ ENNA 2	10A ¤ ENNA 2	10B MUS			9A # SKEV		10A ¤ ENNA 2	10A ¤ ENNA 2
10A NO 1	10C EN		10A NO 1		9A # TV 1	10A NO 1		
10A SAF 1	8B SAF	8A MUS	10A SAF 1		9A # TV 1	10A SAF 1	10A SAF 1	10A SAF 1
10A SAF 1		8B MUS	10A SAF 1	10C KRØ	9A # TV 1	10A SAF 1	10A SAF 1	10A SAF 1
10A NAT	8B SAF	8C MUS	9C SAF	10C KRØ	10B KOH	10A NAT		10A NAT
10A MUS		10A MUS		8C KRØ	10B KOH	8C KRØ		8A KRØ1
10A ENNA 3	10A ENNA 3		10A ENNA 3	8C KRØ	8A KUH	8C KRØ		8B KRØ1
10A ¤ NOMA 3	10C ¤ ENNA 1		10A ¤ NOMA 3	9A KRØ	8A KUH	10A ¤ NOMA 3		10A ¤ NOMA 3
10A ¤ NOMA 4	10C ¤ ENNA 2		8A TV 1	9A KRØ		10A ¤ NOMA 4	10A ¤ NOMA 4	10A ¤ NOMA 4

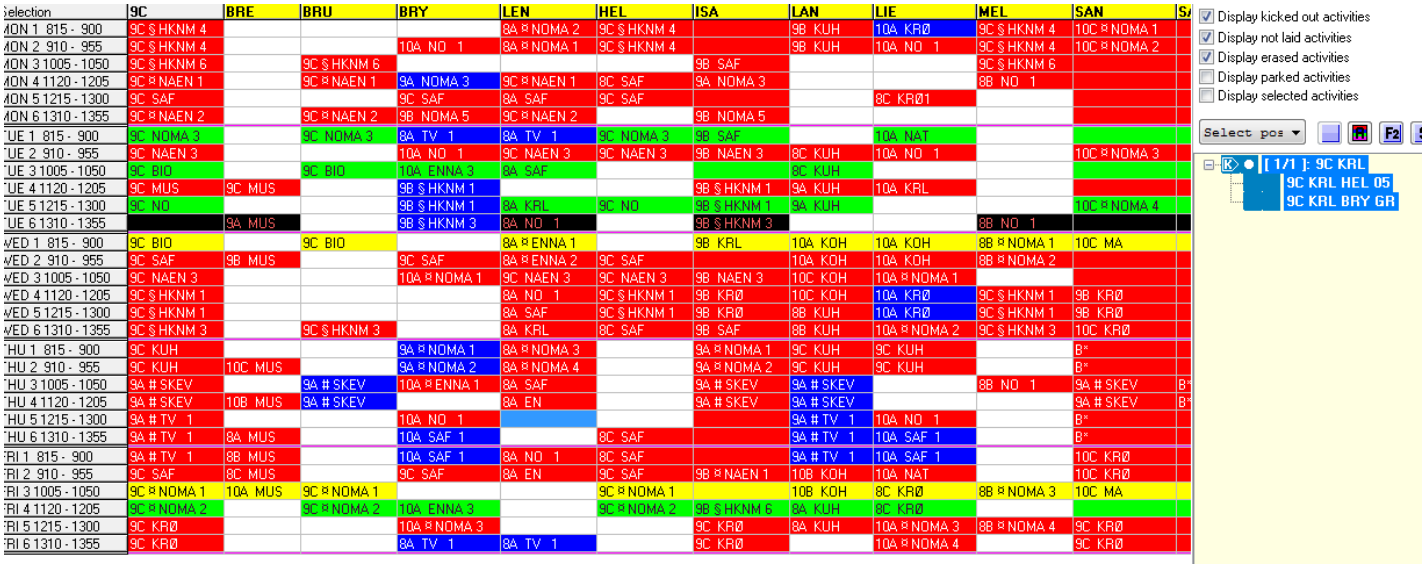
We must find a period where LIE is available and which may be moved to THU 1. The most reasonable seems to be TUE 4 which makes a double of 10A NOMA 5 which is acceptable. We do this drag/drop and get this message:



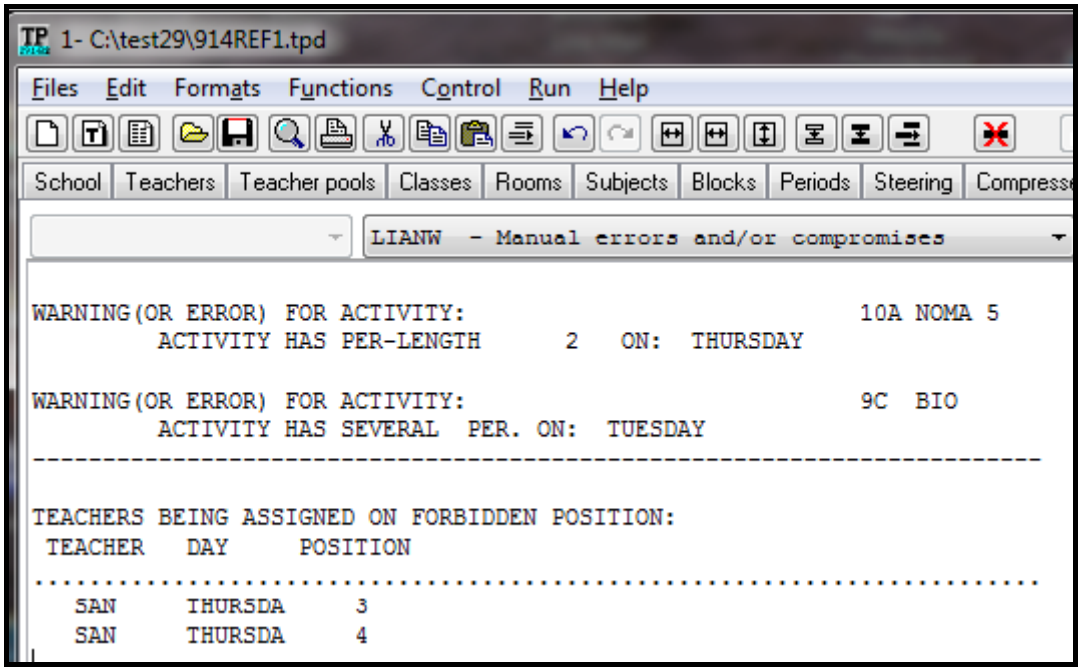
Next we drag 10A KRL from kickout list to TUE 4 and get this message:



This problem is solved and we continue with 9C KRL and create this selection:



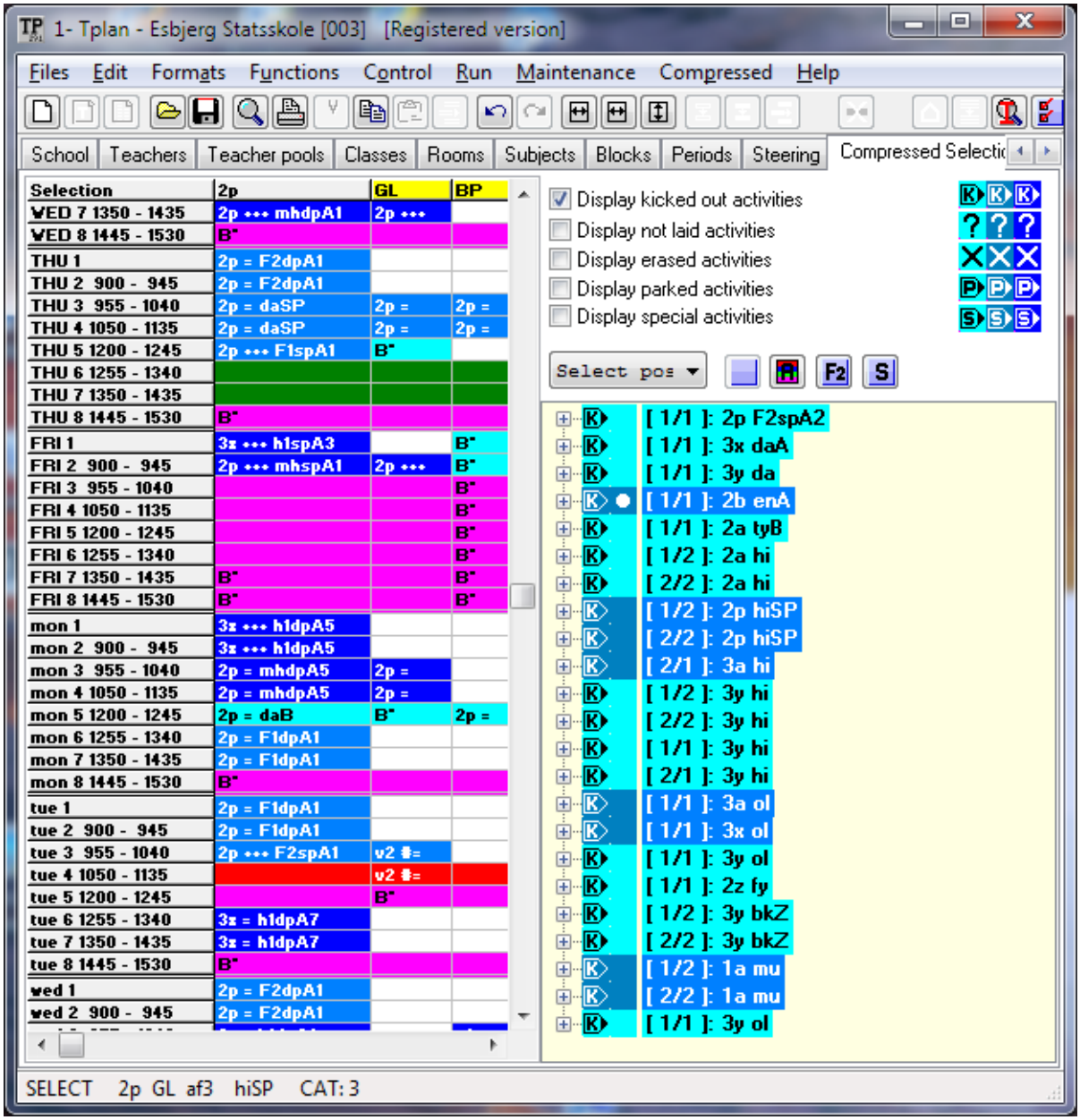
The available period for 9C is TUE 6 being actual pos and Category: Small parallels. We are looking for a period where teacher HEL and BRY is available. A little inspection of the figure above shows: 9C NOMA1 may be moved from FRI 3 to TUE 6 breaking a day conflict which is acceptable. Then BRY and HEL are both available in FRI 3 and 9C KRL may be assigned here. Two drag/drop- operations complete the timetable. The total error warnings (LIANW) are:



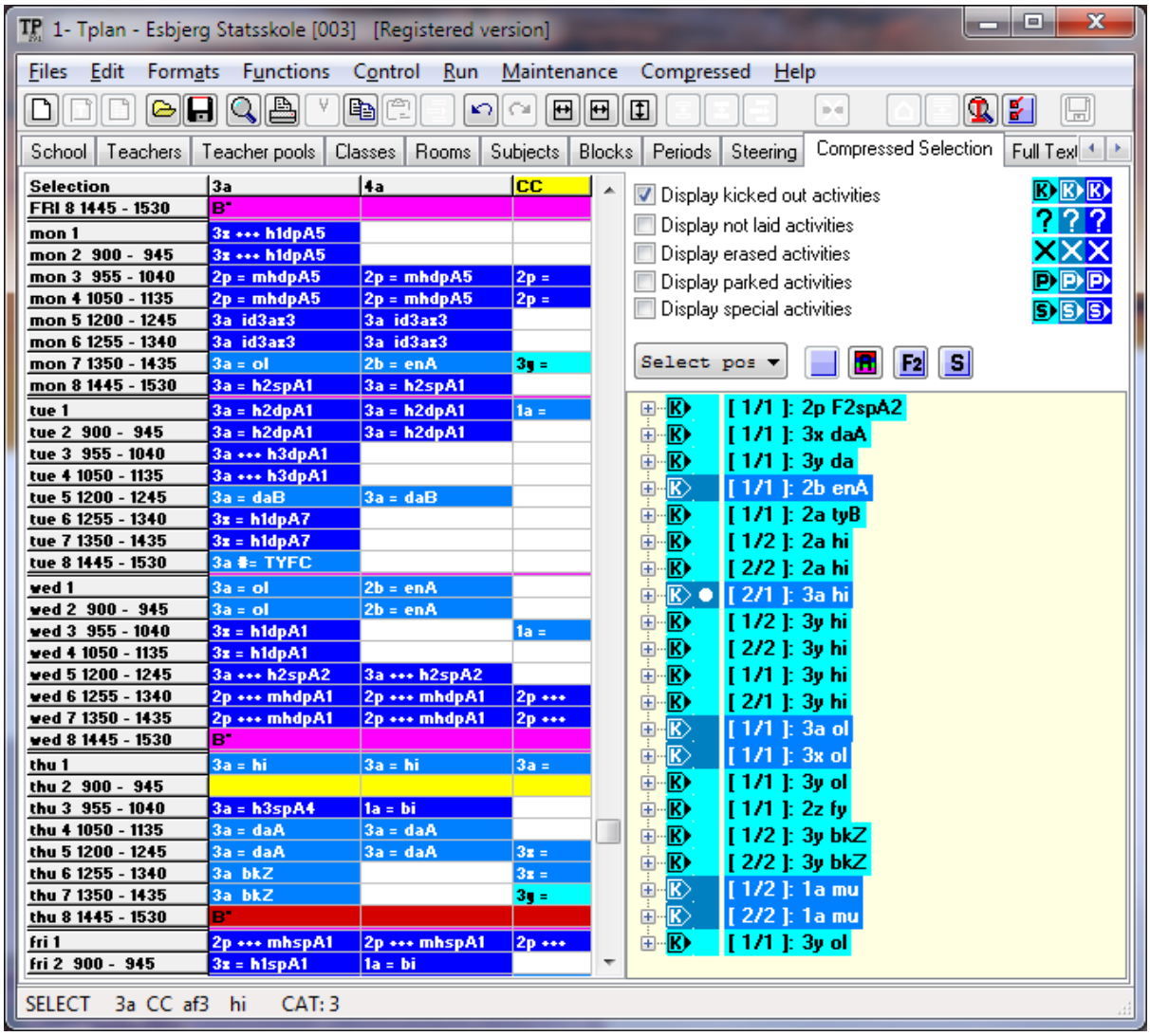
The broken blockings for teacher SAN is in the period register while the two first warnings are caused by our drag/drop operations.

6.3.5 Example 5 (A Danish Gymnasium)

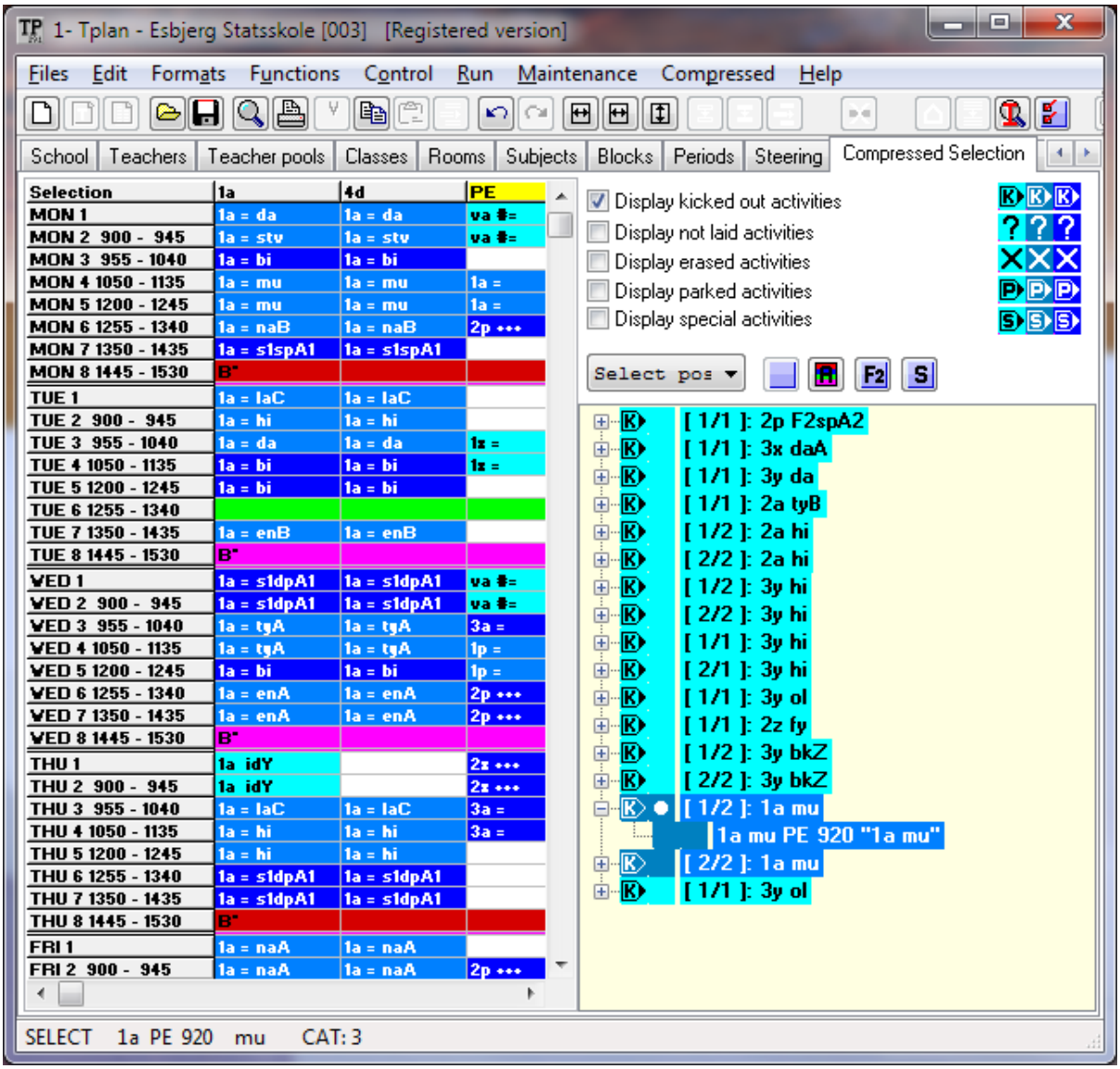
The result of a partial main run looks like this:



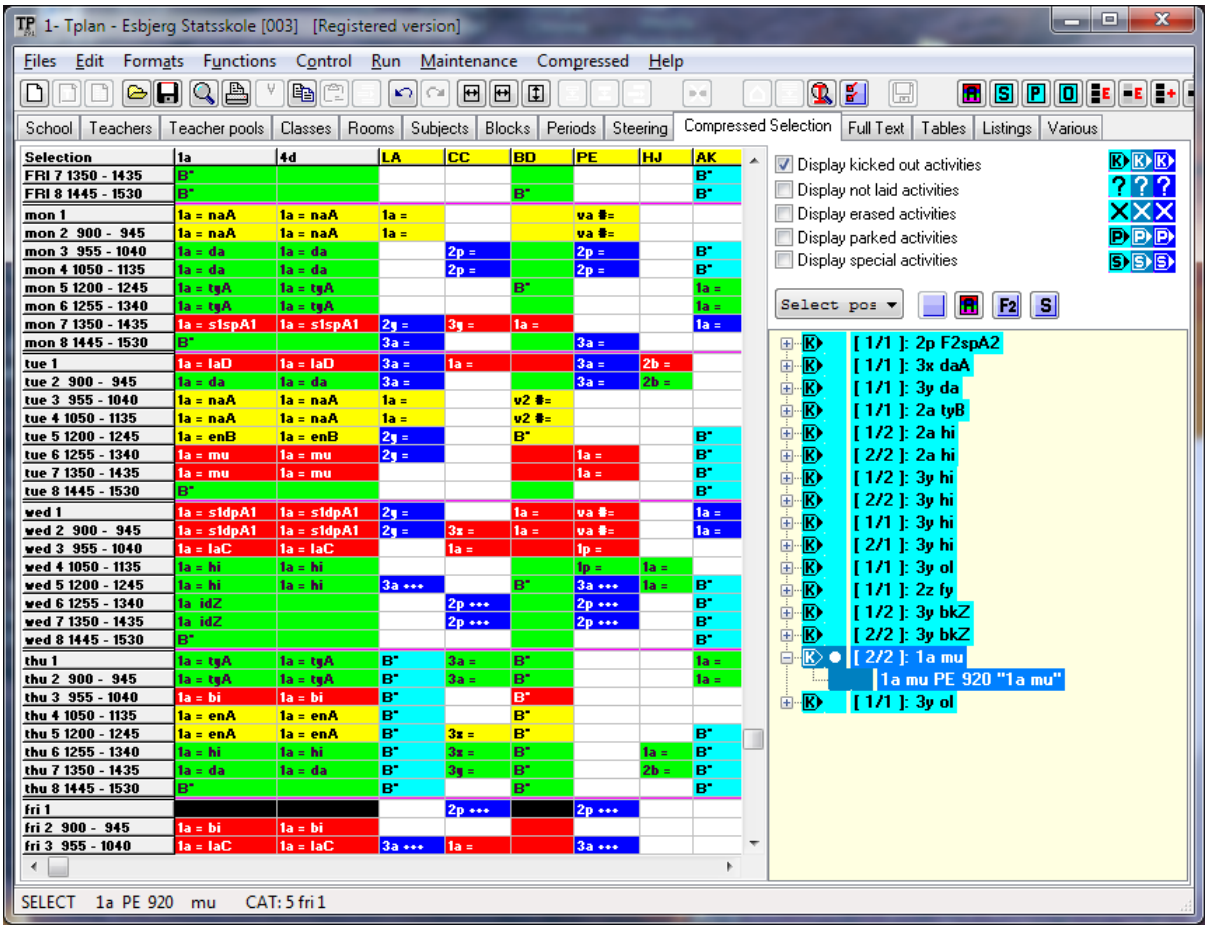
This is far from a simple table and we will only show a part of the adjustments. (There are 80 pos in the table and we can't show complete screens.) . In the above figure it is natural to start with the double in 2p hiSP. From our selection we see that THU 6- 7 may apparently be used without problems. That is simply solved with 2 drag/drops from kickout list to those periods. You can safely assume that TPLAN is not using those periods due to other conflicts, but for the moment we see nothing better to do. Next we continue with:



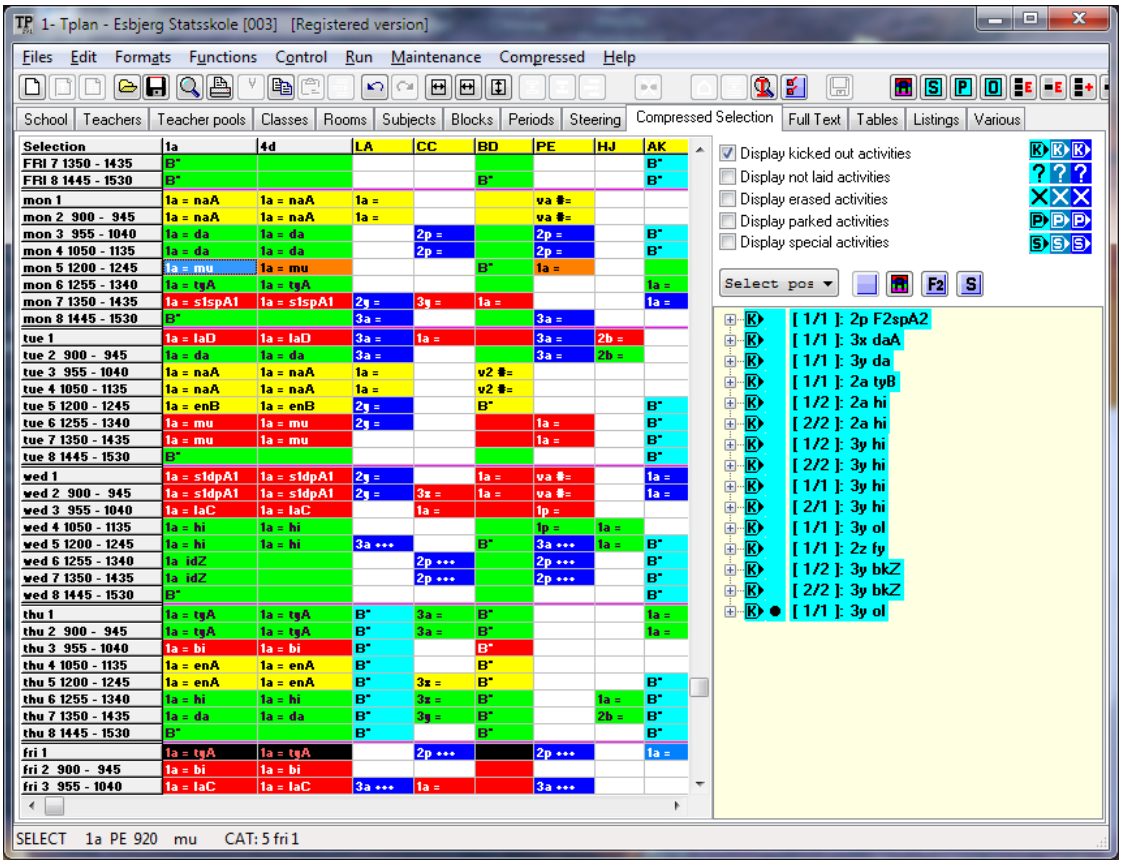
We next try to assign 3a hi and may be made by creating a double on thu. We accept that. We cannot show all details in the continuation. We concentrate to first to get rid of the small parallels in the kickout list (i.e.) we show it for the double in 1a mu:



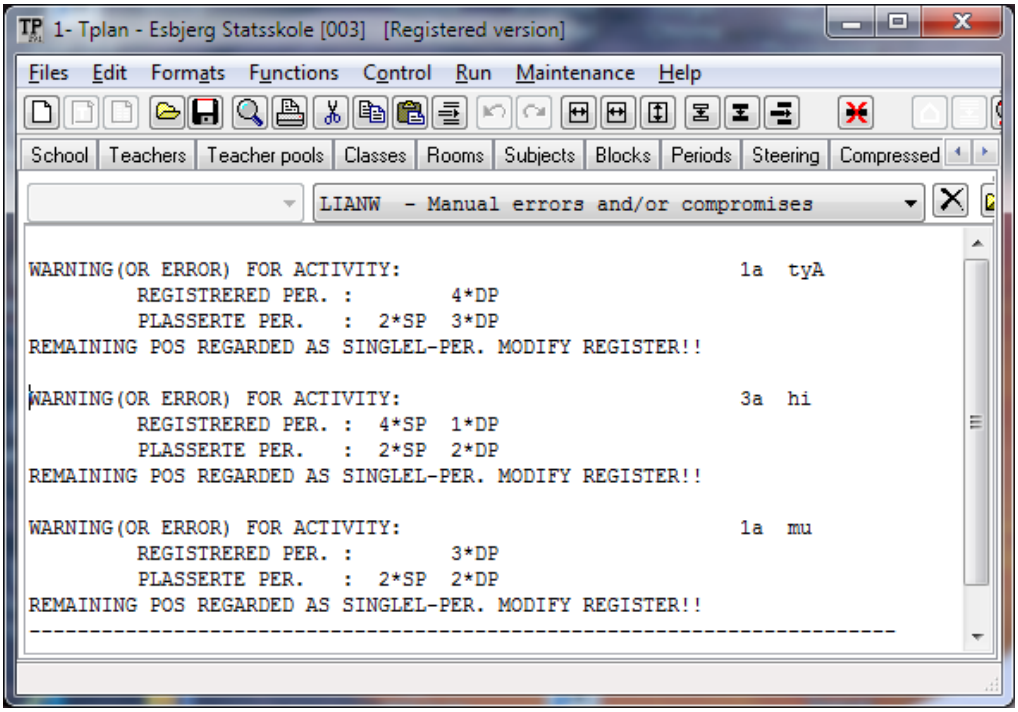
One of the periods may be assigned as a single in TUE 6. We accept that and our next selection shows:



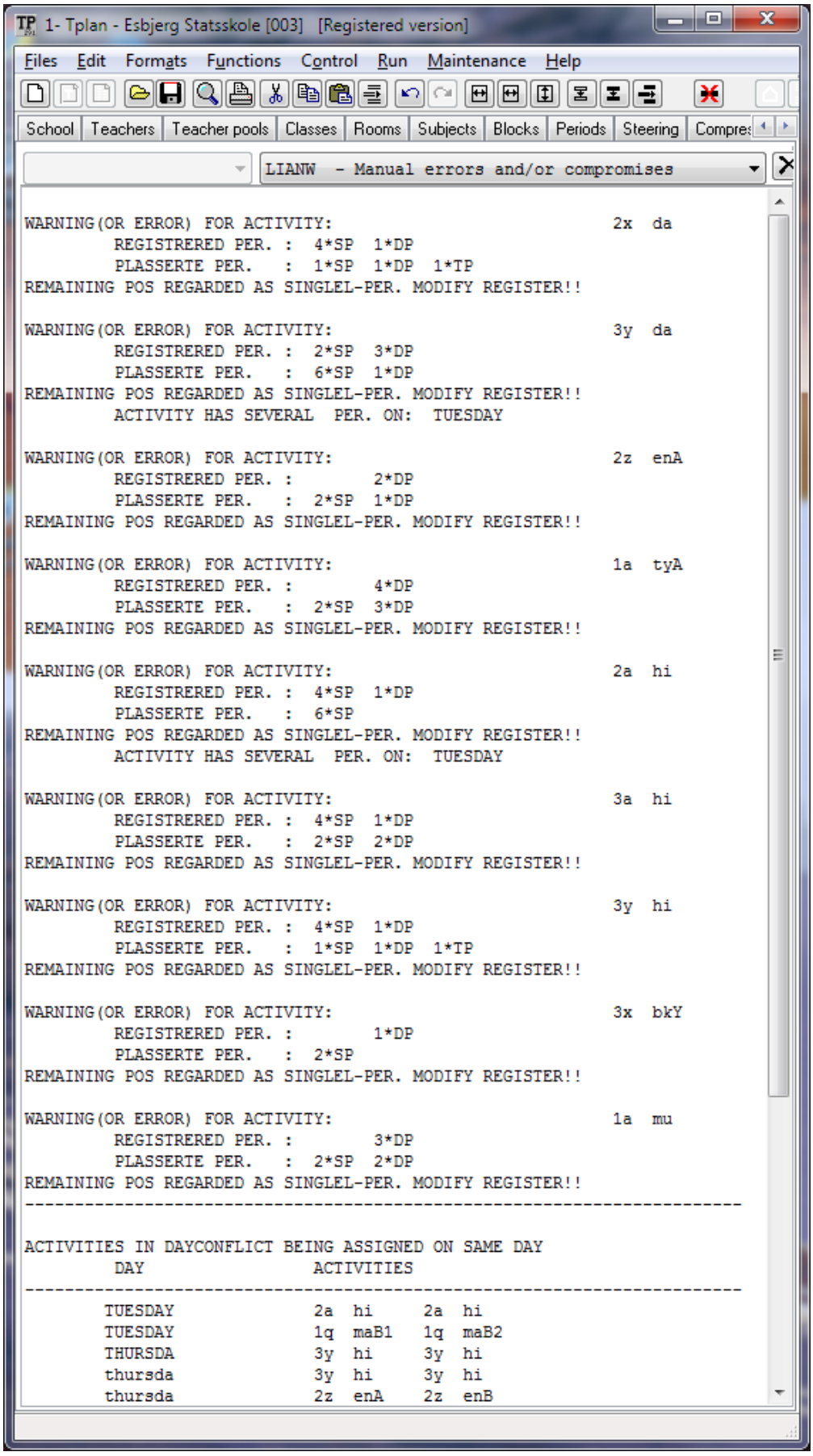
We have selected 1a mu and used fri 1 as actual period. Quit a number of periods may be moved to fri 1. We look for a period where PE is available. We end up with:



We have moved 1a tyA from mon 6 to fri 1 (teacher AK) and inserted 1a mu in mon 6. Our error warnings (LianW) looks like this:

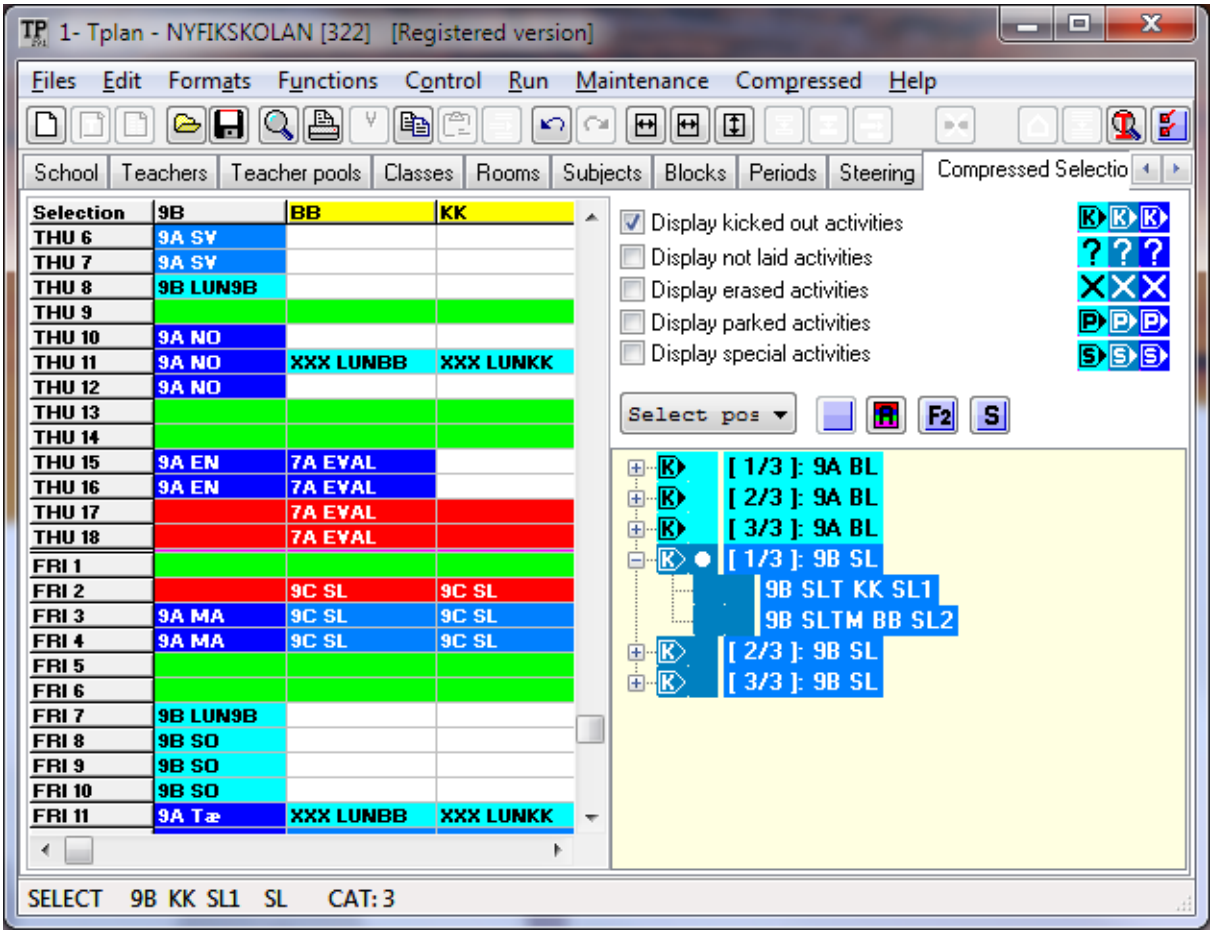


This should be acceptable. The important thing now is the considerable simplified kickout list just containing pure class. Too much to show the remaining adjustments, but for fun I completed this timetable. I ended up with error warnings like this: (I will not comment further; hopefully this is acceptable from the school's point of view.)

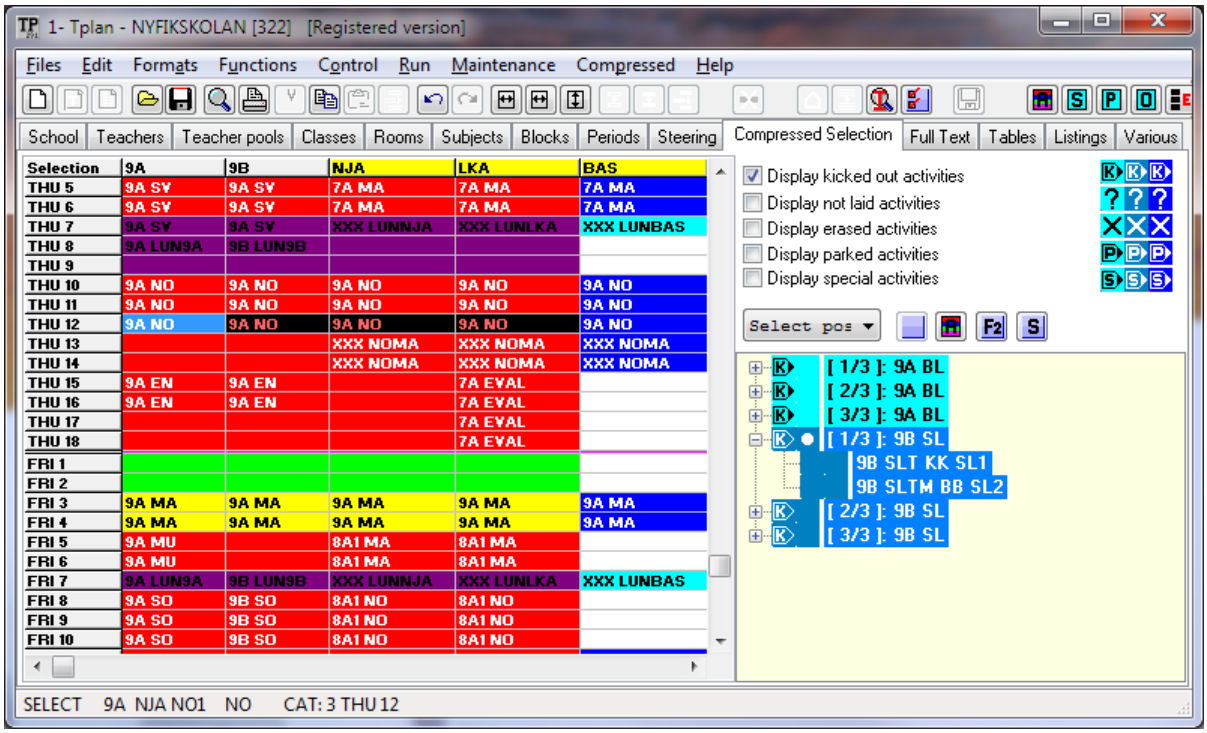

1- Tplan - Esbjerg Statsskole [003] [Registered version]
Files Edit Formats Functions Control Run Maintenance Help
School Teachers Teacher pools Classes Rooms Subjects Blocks Periods Steering Compres
LIANW - Manual errors and/or compromises
WARNING(OR ERROR) FOR ACTIVITY: 2x da
REGISTRERED PER. : 4*SP 1*DP
PLASSERTE PER. : 1*SP 1*DP 1*TP
REMAINING POS REGARDED AS SINGLEL-PER. MODIFY REGISTER!!
WARNING(OR ERROR) FOR ACTIVITY: 3y da
REGISTRERED PER. : 2*SP 3*DP
PLASSERTE PER. : 6*SP 1*DP
REMAINING POS REGARDED AS SINGLEL-PER. MODIFY REGISTER!!
ACTIVITY HAS SEVERAL PER. ON: TUESDAY
WARNING(OR ERROR) FOR ACTIVITY: 2z enA
REGISTRERED PER. : 2*DP
PLASSERTE PER. : 2*SP 1*DP
REMAINING POS REGARDED AS SINGLEL-PER. MODIFY REGISTER!!
WARNING(OR ERROR) FOR ACTIVITY: 1a tyA
REGISTRERED PER. : 4*DP
PLASSERTE PER. : 2*SP 3*DP
REMAINING POS REGARDED AS SINGLEL-PER. MODIFY REGISTER!!
WARNING(OR ERROR) FOR ACTIVITY: 2a hi
REGISTRERED PER. : 4*SP 1*DP
PLASSERTE PER. : 6*SP
REMAINING POS REGARDED AS SINGLEL-PER. MODIFY REGISTER!!
ACTIVITY HAS SEVERAL PER. ON: TUESDAY
WARNING(OR ERROR) FOR ACTIVITY: 3a hi
REGISTRERED PER. : 4*SP 1*DP
PLASSERTE PER. : 2*SP 2*DP
REMAINING POS REGARDED AS SINGLEL-PER. MODIFY REGISTER!!
WARNING(OR ERROR) FOR ACTIVITY: 3y hi
REGISTRERED PER. : 4*SP 1*DP
PLASSERTE PER. : 1*SP 1*DP 1*TP
REMAINING POS REGARDED AS SINGLEL-PER. MODIFY REGISTER!!
WARNING(OR ERROR) FOR ACTIVITY: 3x bkY
REGISTRERED PER. : 1*DP
PLASSERTE PER. : 2*SP
REMAINING POS REGARDED AS SINGLEL-PER. MODIFY REGISTER!!
WARNING(OR ERROR) FOR ACTIVITY: 1a mu
REGISTRERED PER. : 3*DP
PLASSERTE PER. : 2*SP 2*DP
REMAINING POS REGARDED AS SINGLEL-PER. MODIFY REGISTER!!
ACTIVITIES IN DAYCONFLICT BEING ASSIGNED ON SAME DAY
DAY ACTIVITIES
TUESDAY 2a hi 2a hi
TUESDAY 1q maB1 1q maB2
THURSDA 3y hi 3y hi
thursda 3y hi 3y hi
thursda 2z enA 2z enB

6.3.6 Example 7 (Module table)

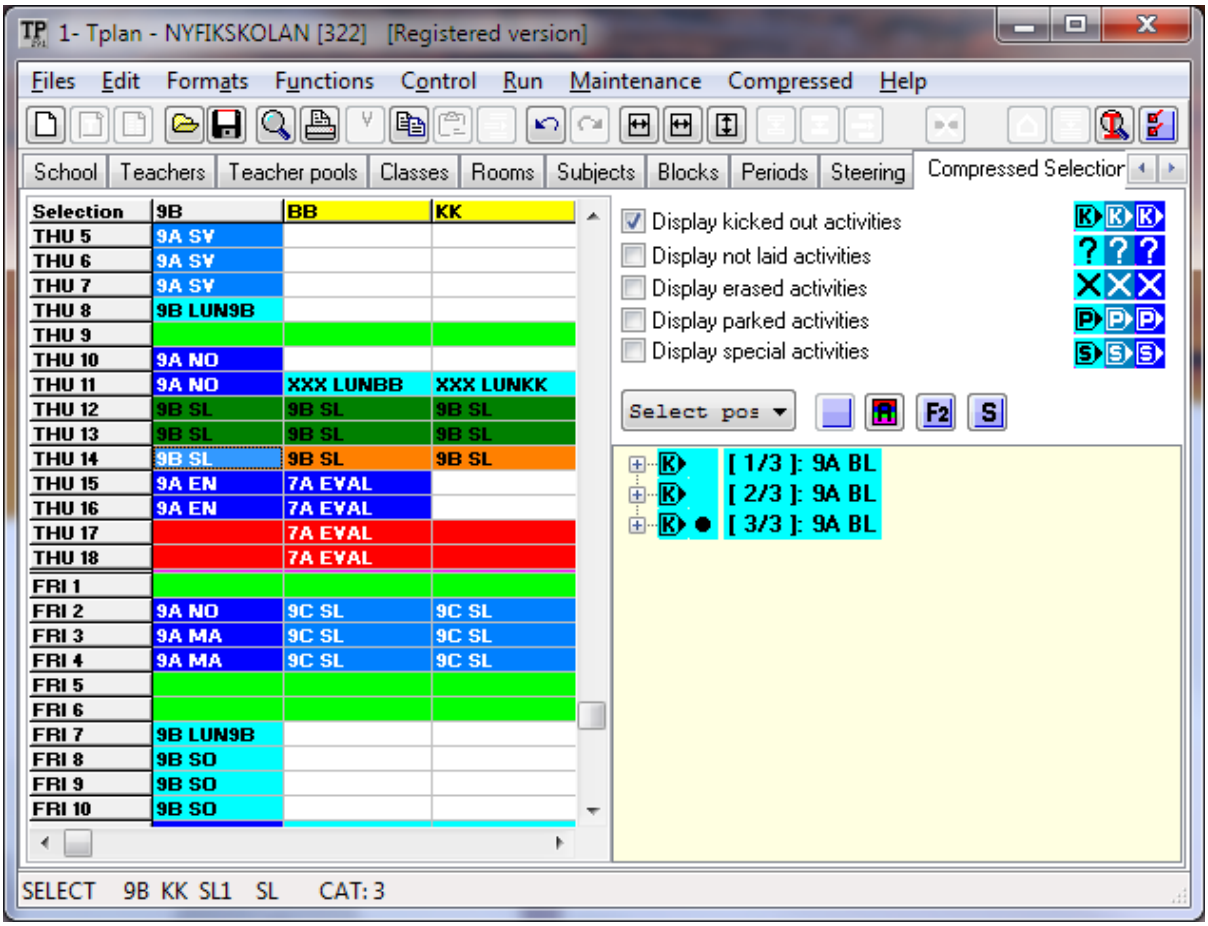
The teaching unit here is small (20 min) but on the other hand the period lengths are multiple (typically 2, 3, 4 and often longer). This is an ideal situation for doing drag/drops as outlined since such a school is often willing to modify original period breakdown. (Within limits). The following school is in fact a no kickout school, but by artificial means I have succeeded in creating kickouts of 2 triples in practical subjects and they shall also be allocated as triples. The start situation is like this:



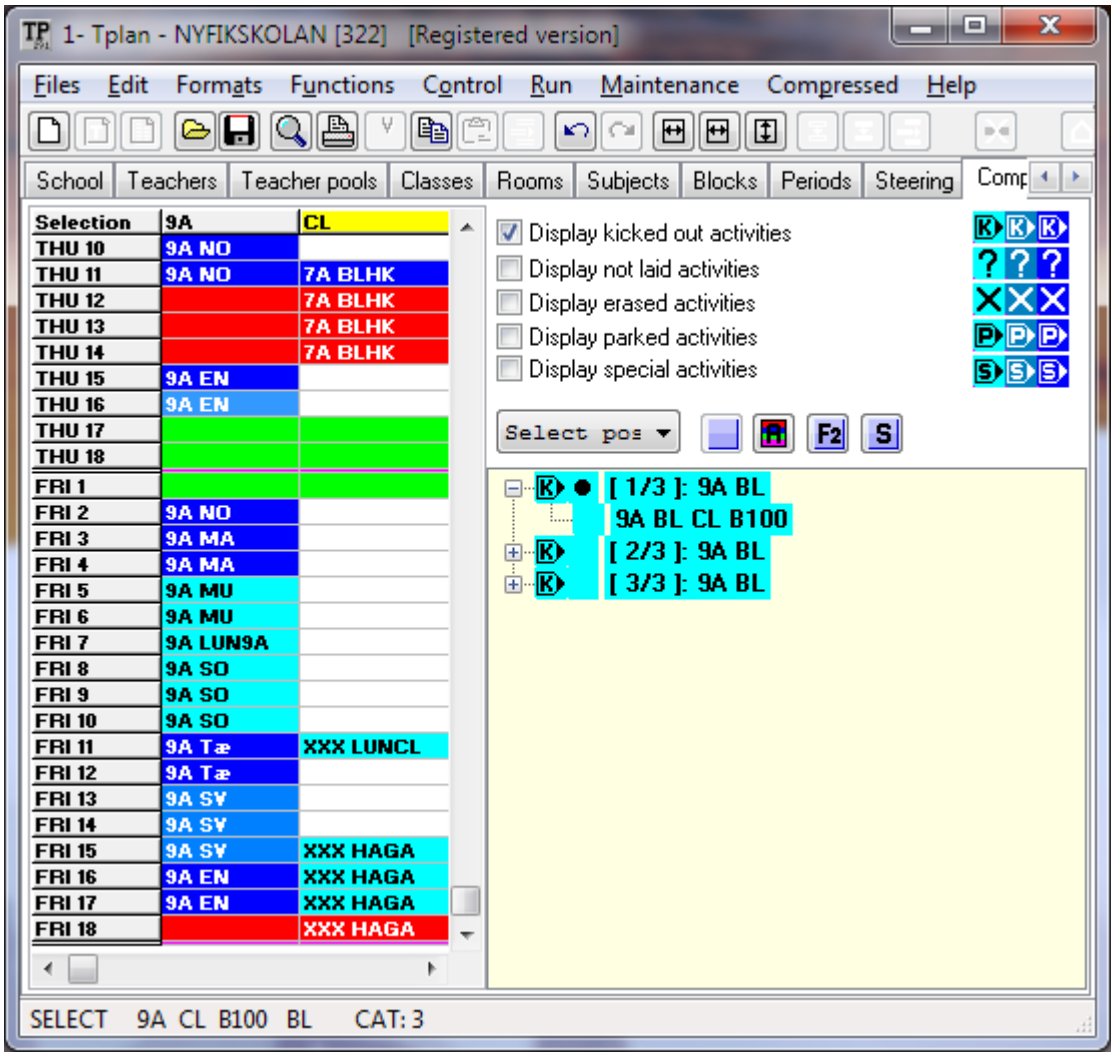
If we could get rid of 9A NO in THU 12 we could assign 9B SL in THU 12-13-14. We attempt that:



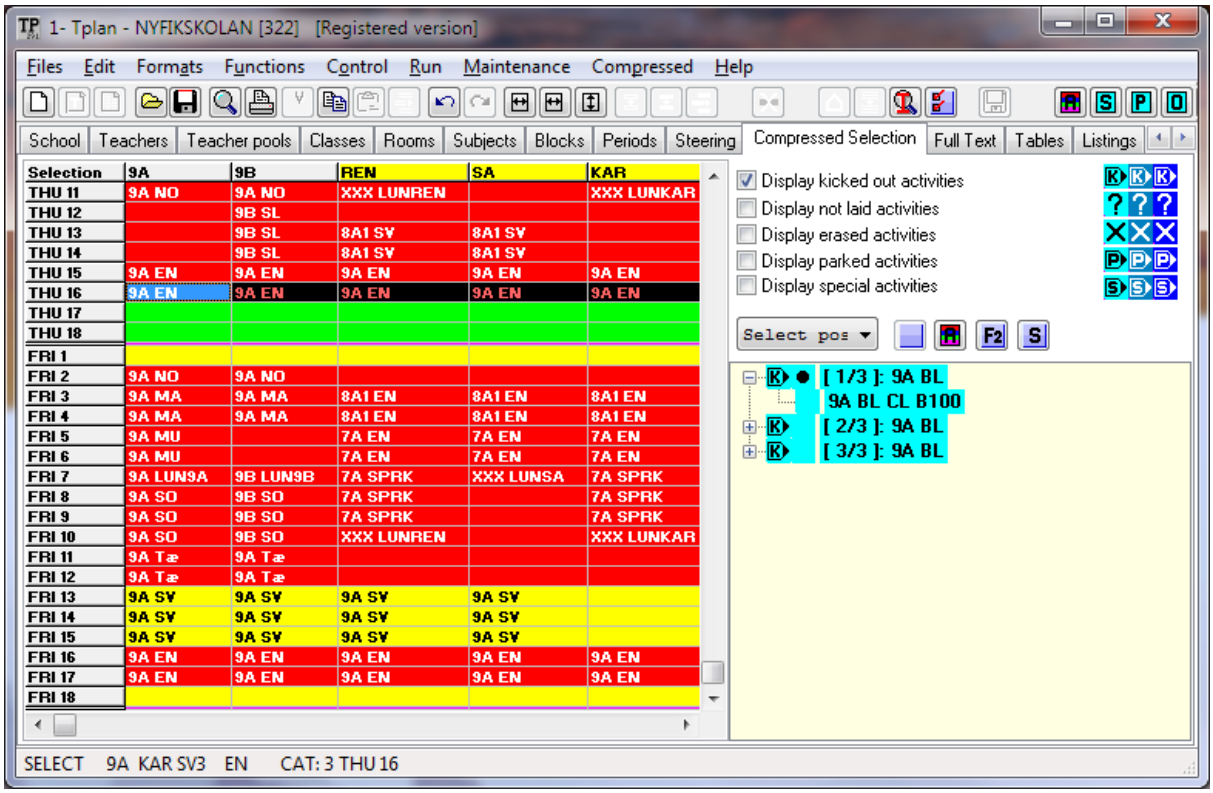
9A NO may be dragged to FRI 2 and 9B SL may be assigned on THU. We do this with 4 drag/drops and end up with:



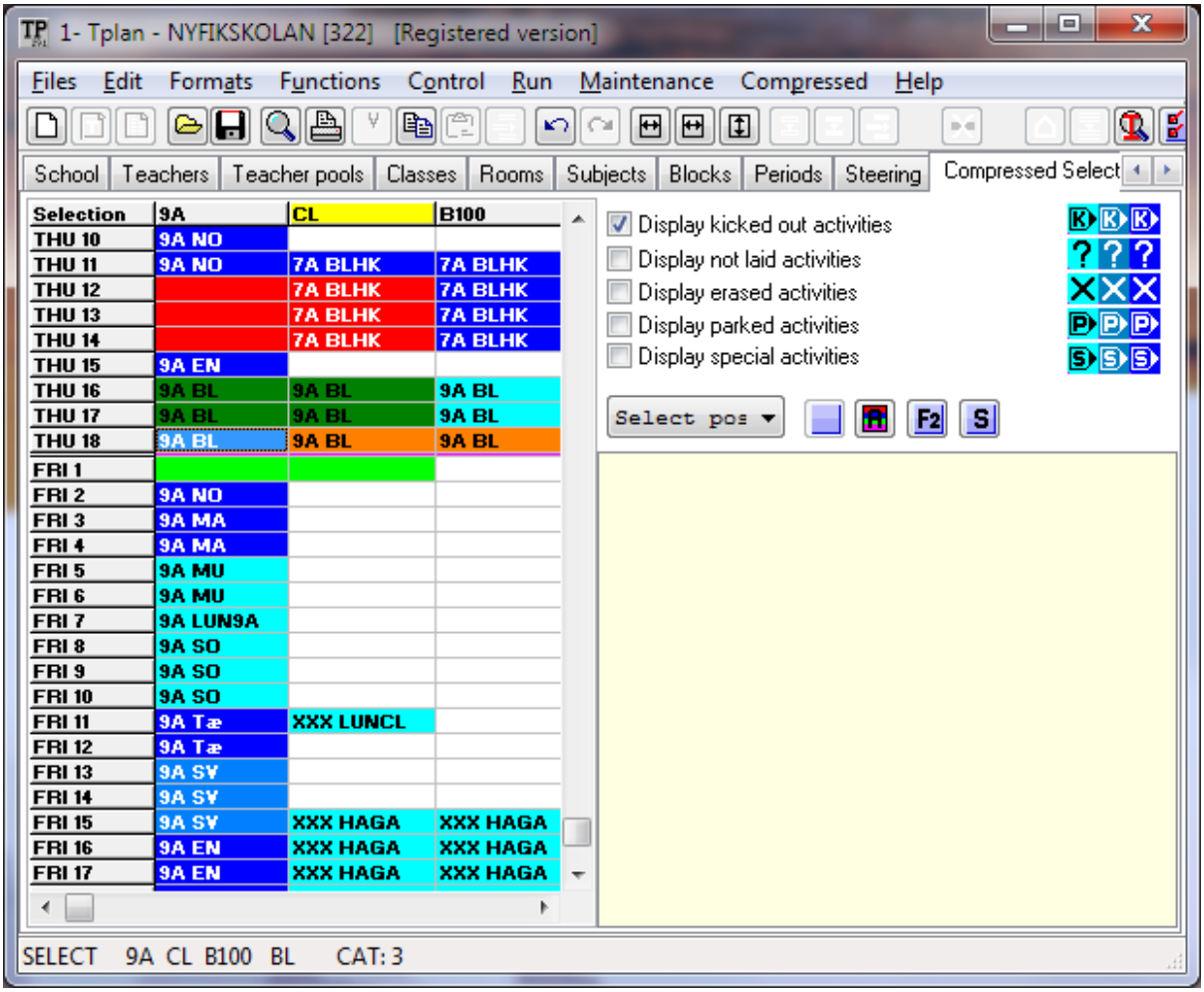
Next 9A BL:



If we could get rid of 9A EN in THU 16 we could assign 9A BL in THU 16-17-18. We could try that:



We could move 9A EN to FRI 18 (as a triple) and assign 9A BL on THU. We do this with 4 drag/drops and end up with:



I hope this shows the general idea. I am not too proud of this example since I am still stuck with 2 single 20-min modules and further work may be needed.

6.4 SOME ADVANCED FACILITIES

Preamble: The facilities mentioned here assume that you have some experience with using Tplan; in particular that you are familiar with the timetabling problems mentioned here. These notes are just some "emergency aid". Due to lack of time, I cannot do more for the moment.

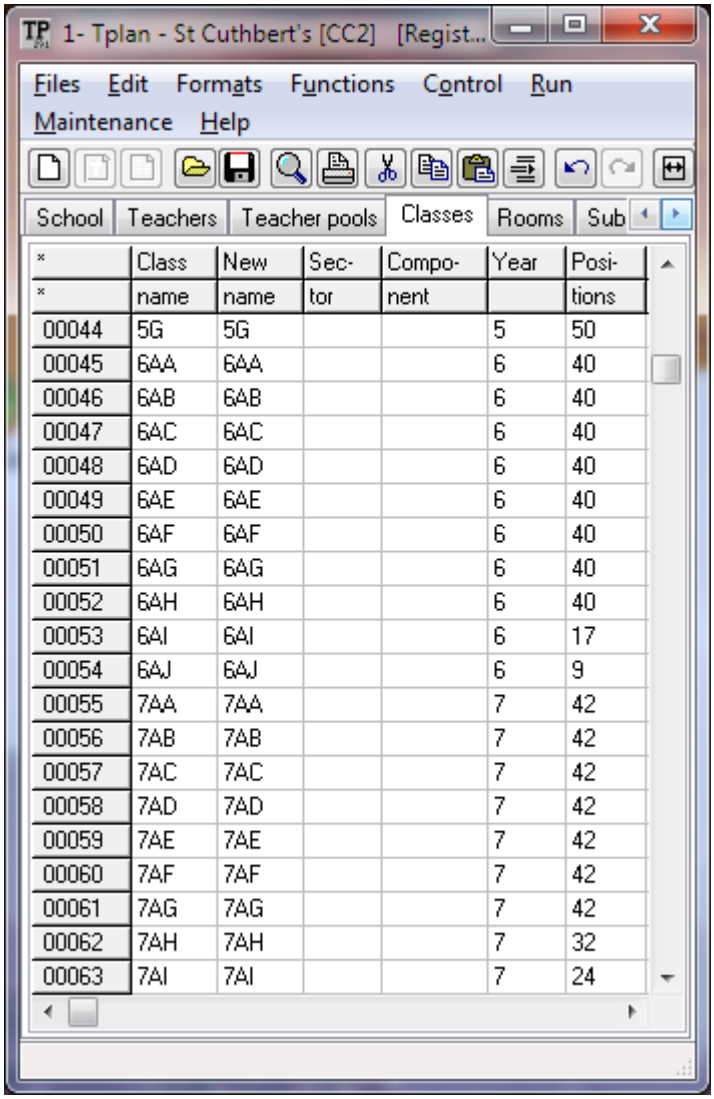
6.4.1 Component setting

The traditional way of defining this mechanism is:

. A Line (Stream) consists of a set of components. In their turn these consist of a set of unique class groups. These groups must **then** be entered in the class register according to some strict rules. Activities (subjects) are then assigned to these classes. The vital component condition is then: **Class groups belonging to different components in a LINE may NEVER be assigned to the same time period while class groups belonging to the SAME component may be assigned to the SAME time period if no other conflicts.**

An alternative way of formulating the same timetabling requirement is as follows:

- A Line (Stream) consists of a set of class groups. These groups are included in activities (subjects) just as traditional classes. However, these activities are given a component property specifying to which Line and which component where it belongs. The vital component condition is then: **Activities belonging to the same LINE but different components here may NEVER be assigned to the same time period while activities also having the SAME line + component property may be assigned to the SAME period if no other conflicts**



*	Class	New	Sec-	Compo-	Year	Posi-
*	name	name	tor	nent		tions
00044	5G	5G			5	50
00045	6AA	6AA			6	40
00046	6AB	6AB			6	40
00047	6AC	6AC			6	40
00048	6AD	6AD			6	40
00049	6AE	6AE			6	40
00050	6AF	6AF			6	40
00051	6AG	6AG			6	40
00052	6AH	6AH			6	40
00053	6AI	6AI			6	17
00054	6AJ	6AJ			6	9
00055	7AA	7AA			7	42
00056	7AB	7AB			7	42
00057	7AC	7AC			7	42
00058	7AD	7AD			7	42
00059	7AE	7AE			7	42
00060	7AF	7AF			7	42
00061	7AG	7AG			7	42
00062	7AH	7AH			7	32
00063	7AI	7AI			7	24

From a mathematical (and also practical) point of view these definitions are identical. The first case is documented in current User Manual, and here we describe the second method for defining components.

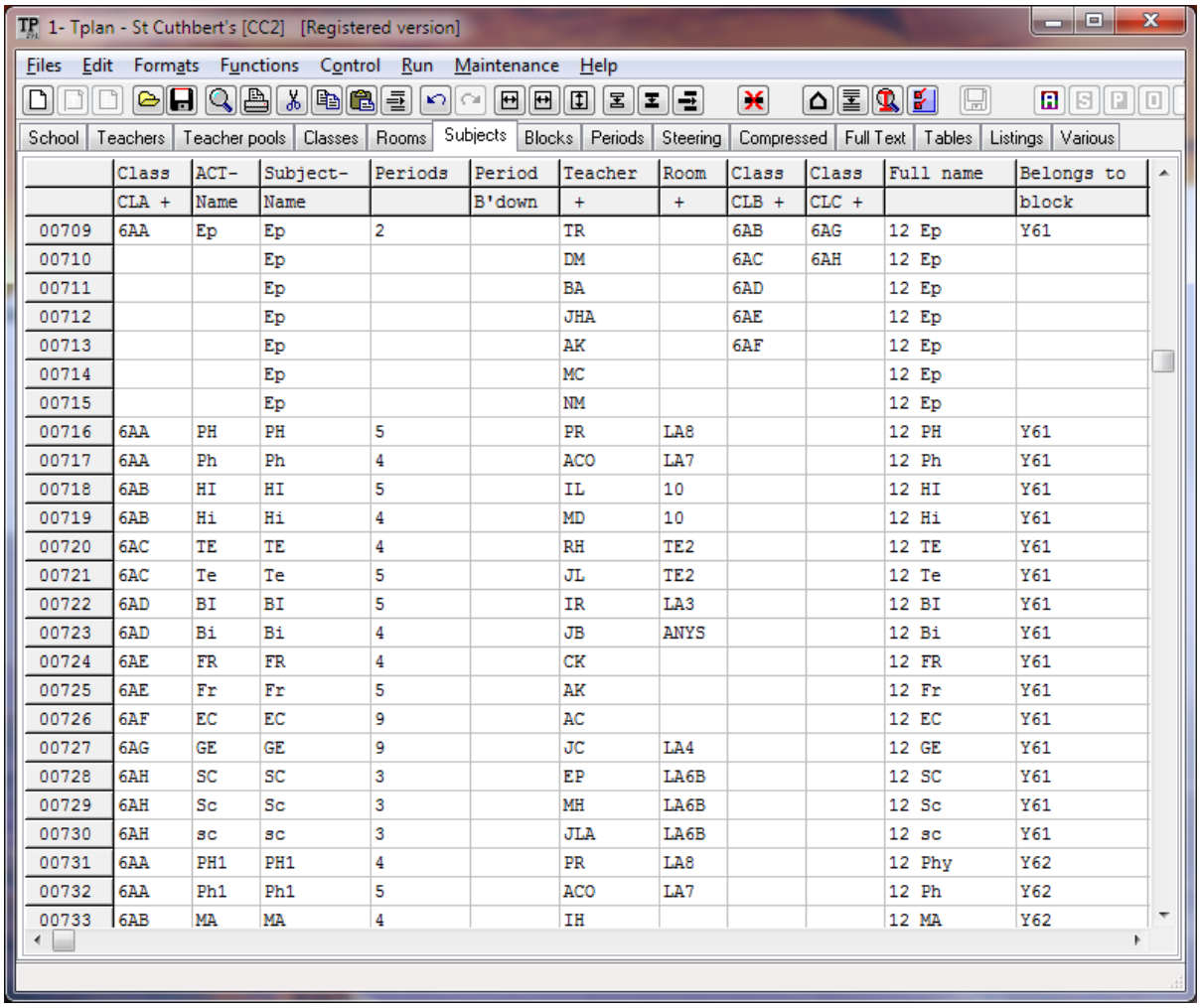
To use this method **you** must as a start use a **special run option for that**. Till further notice we will allow both methods for defining components.

You check the new run option: **New component rules** to use the alternative data specification. Your class register will then look like the following this figure

This is all classes if you have components in form 6 and 7. **You only have as many class symbols as the maximum number of class groups in the various components. Notice further that you don't use the Component column and in the column Positions you enter the sum of periods linked to the various class symbols.**

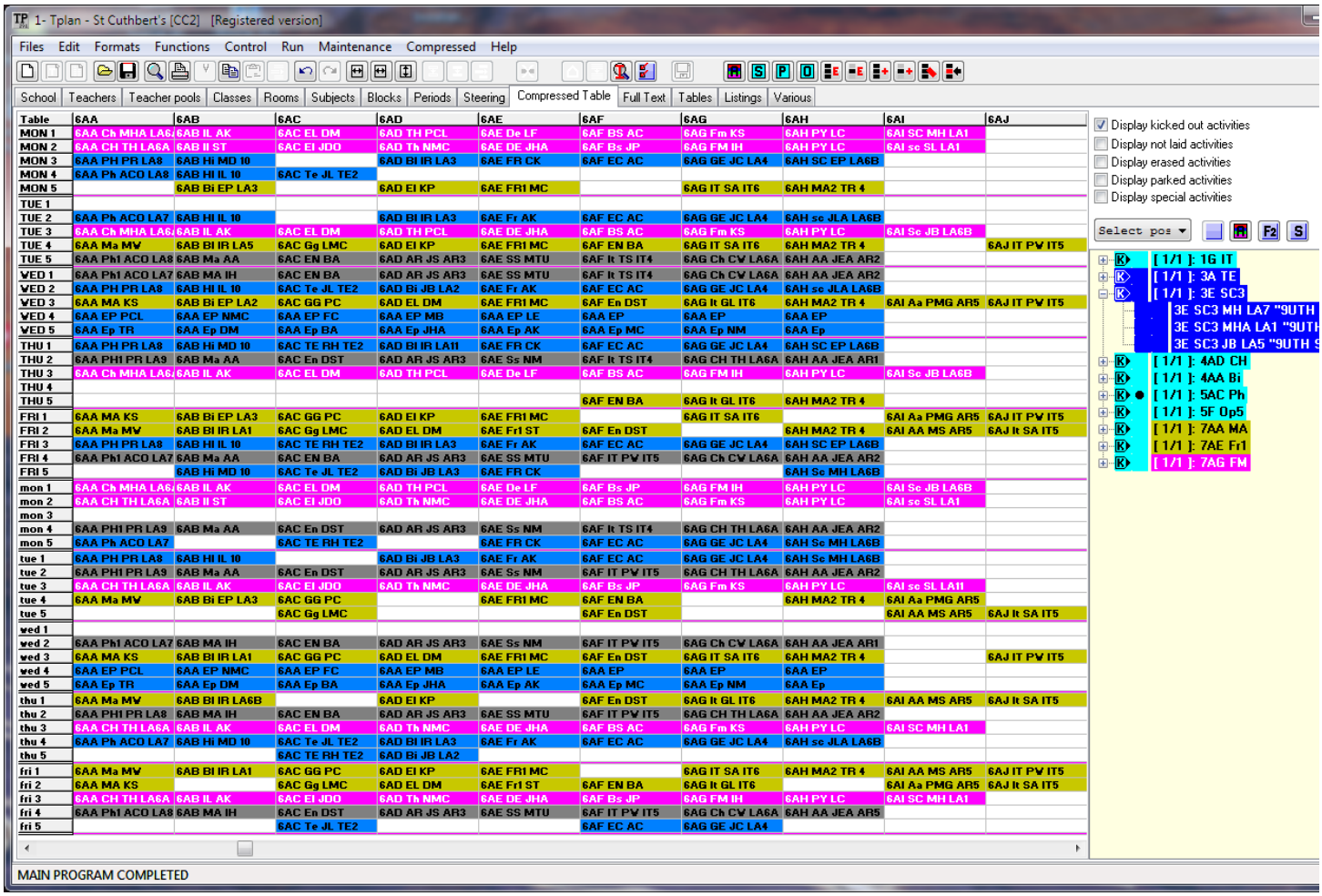
The data entry in the subject register will look like the next figure. Notice here the column **Belongs to block (To be substituted with the heading: Component).**

This is more or less the same as the Component column in class register with the earlier method. Instead of stating that sets of class symbols belongs to different components, we are now saying to which component the individual activity belongs. The obvious advantage of this convention that you get rid of the vast number of class symbols using older conventions. Furthermore you are rid of all rigid rules of the relative order of these class symbols. You are allowed to enter component – activities in any way you like in subject register as long as you remember to link the subject to the proper component. There is however a small new restriction with the new rules and that is shown in the figure: Class 6AA has the subject PH belonging to component Y61. Further down you see that class symbol 6AA is getting the subject PH once more but now it is in the Y62 component. Tplan as a whole require that different subjects have different identifiers; accordingly you are "forced" to use the names PH1 and Ph1 for the Y62- subject. I believe this is a small price to pay for having much simpler conventions. Besides the error checking in Tplan easily detects use of same name for different subjects.(Use Inspect button)

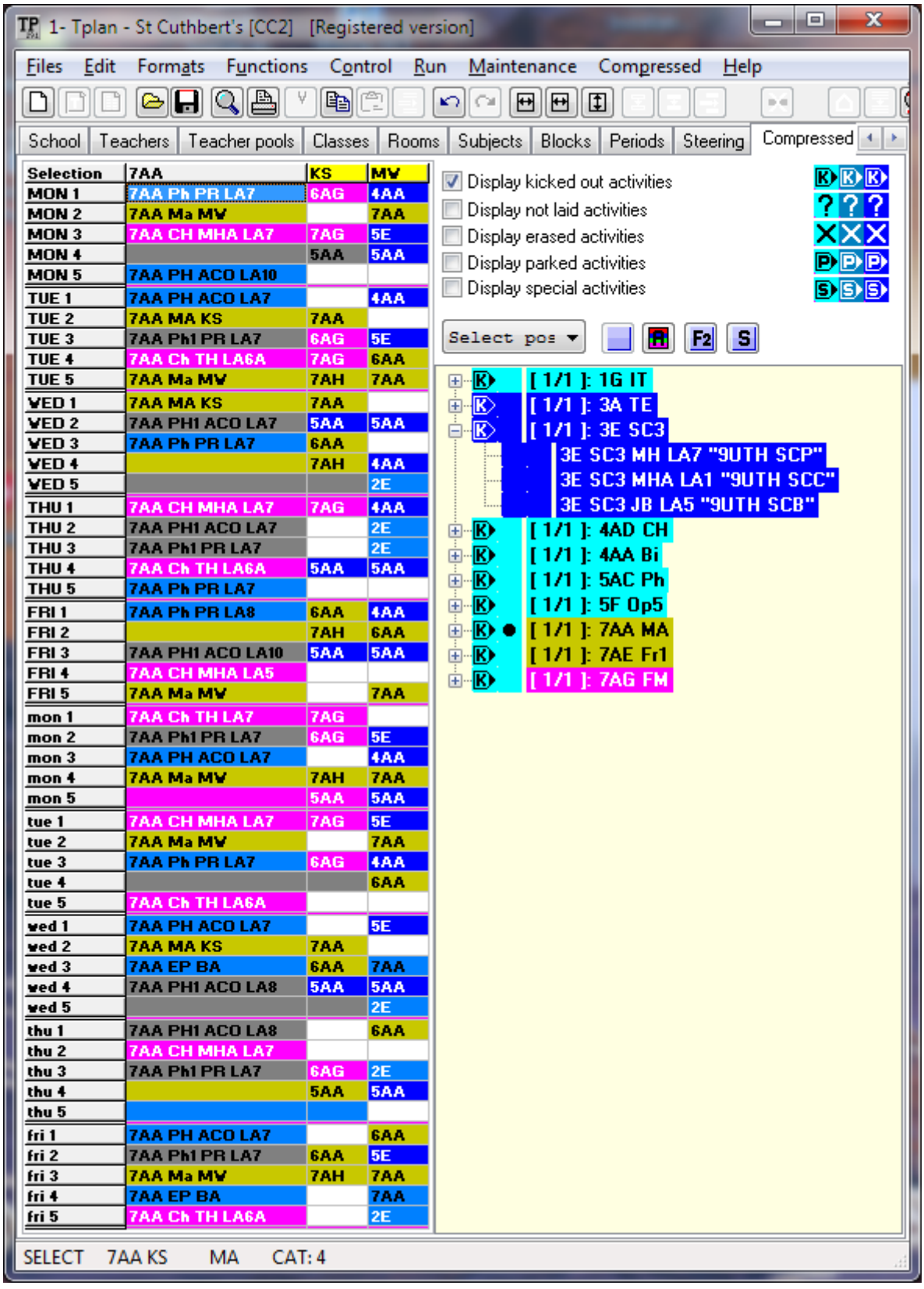


	Class	ACT-	Subject-	Periods	Period	Teacher	Room	Class	Class	Full name	Belongs to
	CLA +	Name	Name		B'down	+	+	CLB +	CLC +		block
00709	6AA	Ep	Ep	2		TR		6AB	6AG	12 Ep	Y61
00710			Ep			DM		6AC	6AH	12 Ep	
00711			Ep			BA		6AD		12 Ep	
00712			Ep			JHA		6AE		12 Ep	
00713			Ep			AK		6AF		12 Ep	
00714			Ep			MC				12 Ep	
00715			Ep			NM				12 Ep	
00716	6AA	PH	PH	5		PR	LA8			12 PH	Y61
00717	6AA	Ph	Ph	4		ACO	LA7			12 Ph	Y61
00718	6AB	HI	HI	5		IL	10			12 HI	Y61
00719	6AB	Hi	Hi	4		MD	10			12 Hi	Y61
00720	6AC	TE	TE	4		RH	TE2			12 TE	Y61
00721	6AC	Te	Te	5		JL	TE2			12 Te	Y61
00722	6AD	BI	BI	5		IR	LA3			12 BI	Y61
00723	6AD	Bi	Bi	4		JB	ANYS			12 Bi	Y61
00724	6AE	FR	FR	4		CK				12 FR	Y61
00725	6AE	Fr	Fr	5		AK				12 Fr	Y61
00726	6AF	EC	EC	9		AC				12 EC	Y61
00727	6AG	GE	GE	9		JC	LA4			12 GE	Y61
00728	6AH	SC	SC	3		EP	LA6B			12 SC	Y61
00729	6AH	Sc	Sc	3		MH	LA6B			12 Sc	Y61
00730	6AH	sc	sc	3		JLA	LA6B			12 sc	Y61
00731	6AA	PH1	PH1	4		PR	LA8			12 Phy	Y62
00732	6AA	Ph1	Ph1	5		ACO	LA7			12 Ph	Y62
00733	6AB	MA	MA	4		IH				12 MA	Y62

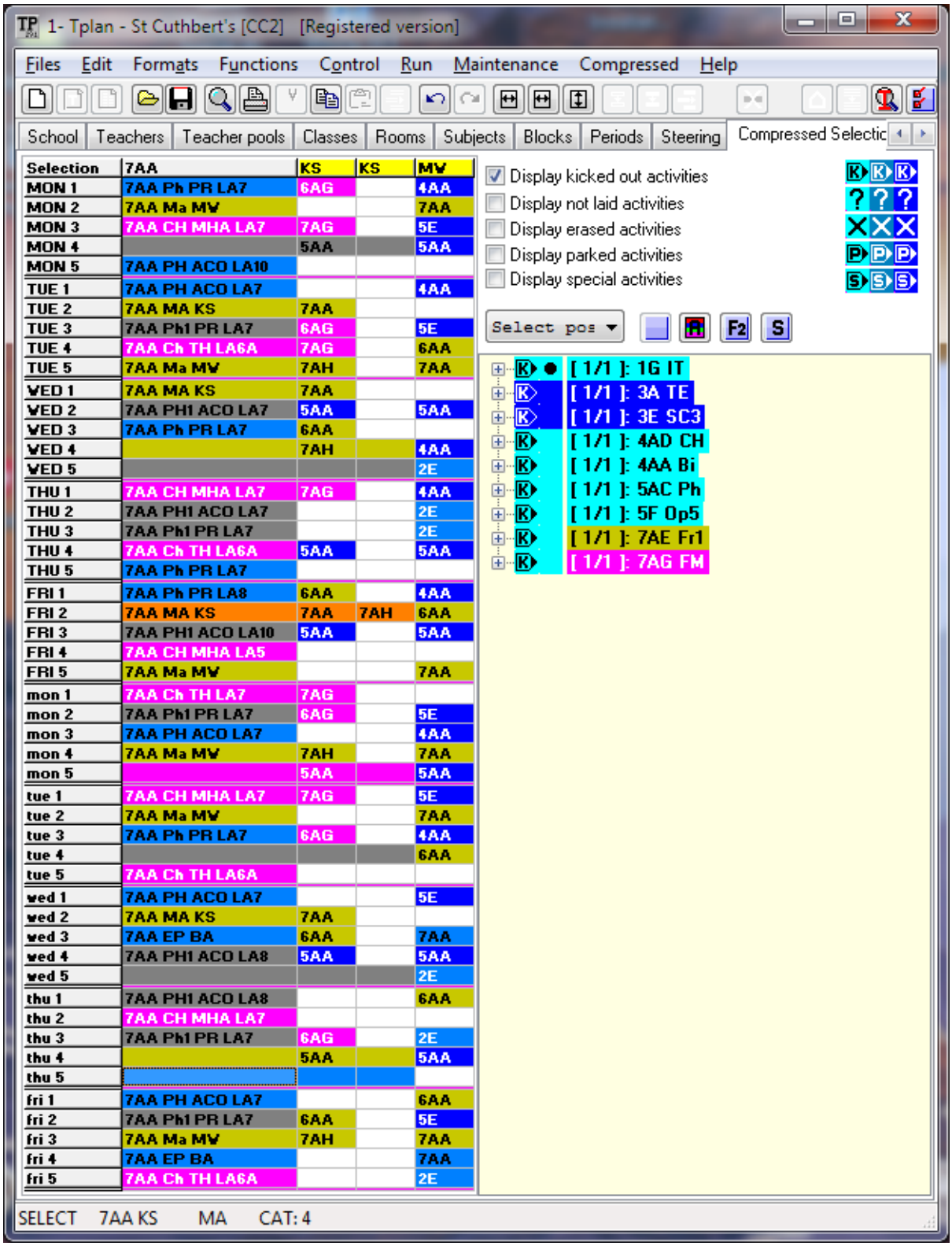
Next figure shows a further advantage by using new conventions:



All subjects belonging to 6AA is nicely ordered in the same column as for all other component classes. With the older rules you had much less control over which subjects were allocated to the same column. To the right in the figure we have the Kickout list and we shall do a few adjustments:

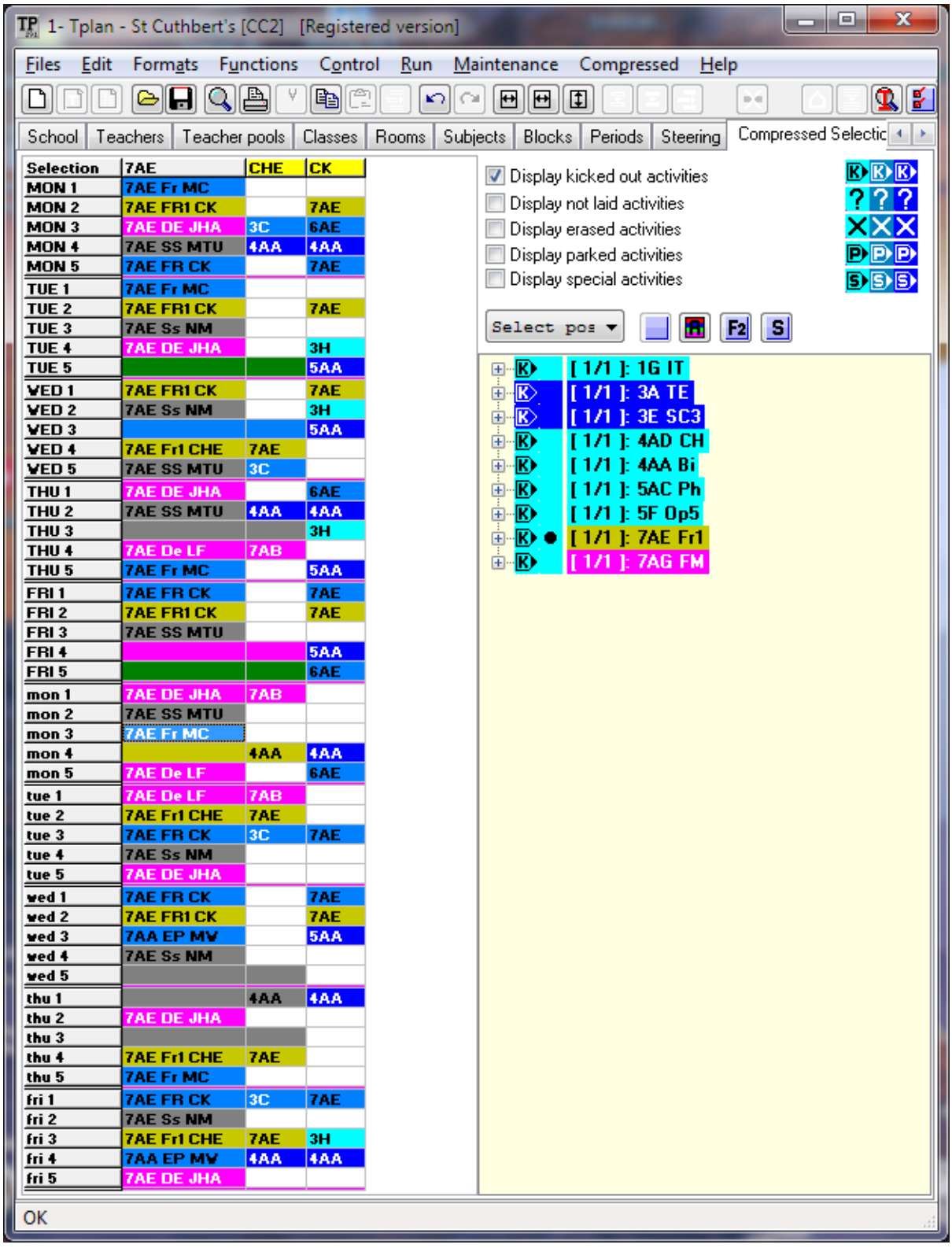


In this situation we want to assign 7AA MA and select that to use P4 and as Category we use: Pure Class act. The figure above then shows the 7AA column and the two teachers in Y73- act. (I.e. yellow brown cells) The possible periods are: WED 4, FRI 2 and thu 4. Both actual teachers are occupied in these positions. Normally it is “impossible” to free these teachers in these periods and some compromise must be done. We notice that KS is teaching 7AH in MA in WED 4 and FRI 2. Perhaps he could teach both groups for one period? We select that compromise like this:



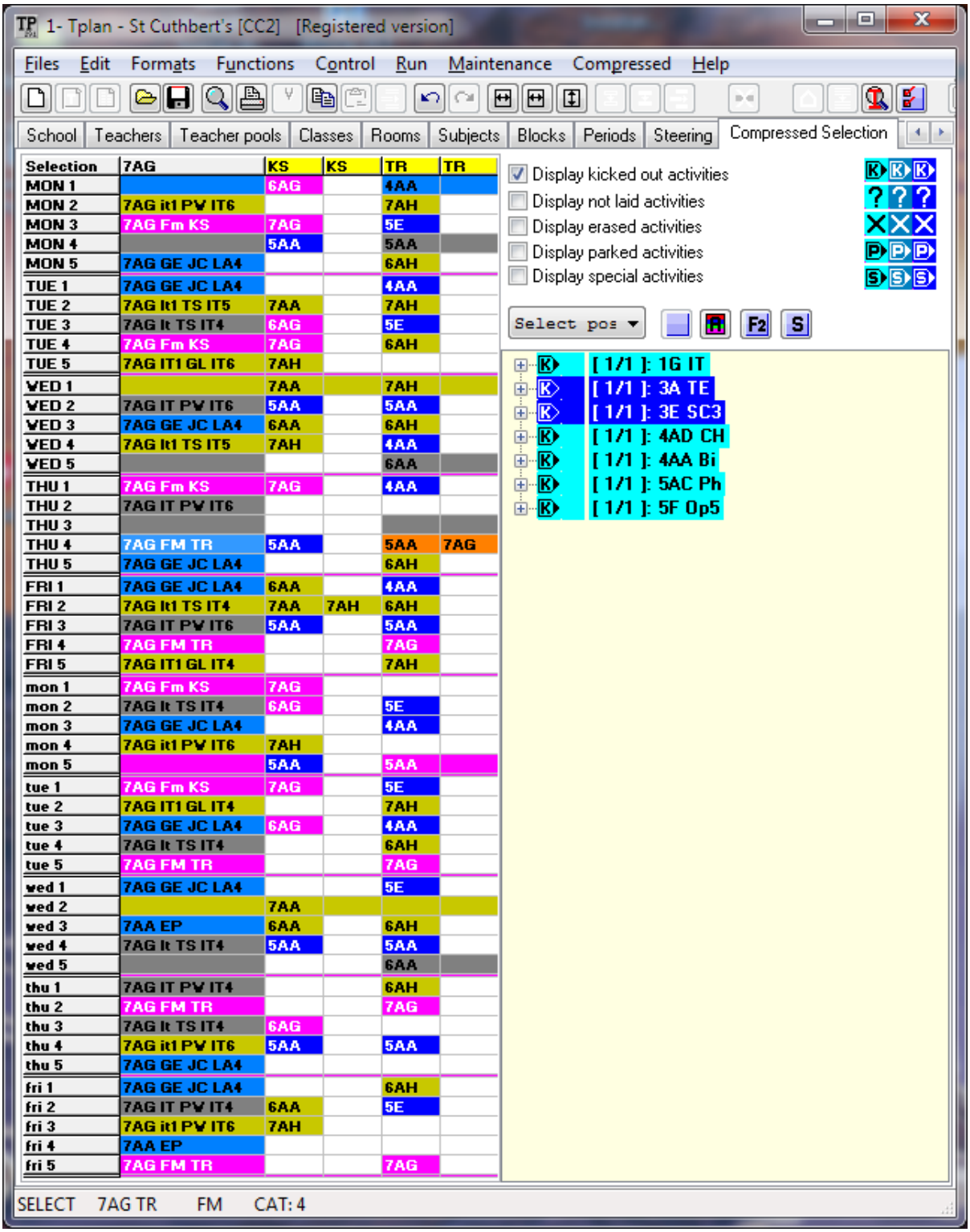
Selection	7AA	KS	KS	MV
MON 1	7AA Ph PR LA7	6AG		4AA
MON 2	7AA Ma MV			7AA
MON 3	7AA CH MHA LA7	7AG		5E
MON 4		5AA		5AA
MON 5	7AA PH ACO LA10			
TUE 1	7AA PH ACO LA7			4AA
TUE 2	7AA MA KS	7AA		
TUE 3	7AA Ph1 PR LA7	6AG		5E
TUE 4	7AA Ch TH LA6A	7AG		6AA
TUE 5	7AA Ma MV	7AH		7AA
WED 1	7AA MA KS	7AA		
WED 2	7AA PH1 ACO LA7	5AA		5AA
WED 3	7AA Ph PR LA7	6AA		
WED 4		7AH		4AA
WED 5				2E
THU 1	7AA CH MHA LA7	7AG		4AA
THU 2	7AA PH1 ACO LA7			2E
THU 3	7AA Ph1 PR LA7			2E
THU 4	7AA Ch TH LA6A	5AA		5AA
THU 5	7AA Ph PR LA7			
FRI 1	7AA Ph PR LA8	6AA		4AA
FRI 2	7AA MA KS	7AA	7AH	6AA
FRI 3	7AA PH1 ACO LA10	5AA		5AA
FRI 4	7AA CH MHA LA5			
FRI 5	7AA Ma MV			7AA
mon 1	7AA Ch TH LA7	7AG		
mon 2	7AA Ph1 PR LA7	6AG		5E
mon 3	7AA PH ACO LA7			4AA
mon 4	7AA Ma MV	7AH		7AA
mon 5		5AA		5AA
tue 1	7AA CH MHA LA7	7AG		5E
tue 2	7AA Ma MV			7AA
tue 3	7AA Ph PR LA7	6AG		4AA
tue 4				6AA
tue 5	7AA Ch TH LA6A			
wed 1	7AA PH ACO LA7			5E
wed 2	7AA MA KS	7AA		
wed 3	7AA EP BA	6AA		7AA
wed 4	7AA PH1 ACO LA8	5AA		5AA
wed 5				2E
thu 1	7AA PH1 ACO LA8			6AA
thu 2	7AA CH MHA LA7			
thu 3	7AA Ph1 PR LA7	6AG		2E
thu 4		5AA		5AA
thu 5				
fri 1	7AA PH ACO LA7			6AA
fri 2	7AA Ph1 PR LA7	6AA		5E
fri 3	7AA Ma MV	7AH		7AA
fri 4	7AA EP BA			7AA
fri 5	7AA Ch TH LA6A			2E

The above figure is created by one P1- drag and then blowing up (F5). Next we select 7AE Fr1 (Pure class) and get this selection:



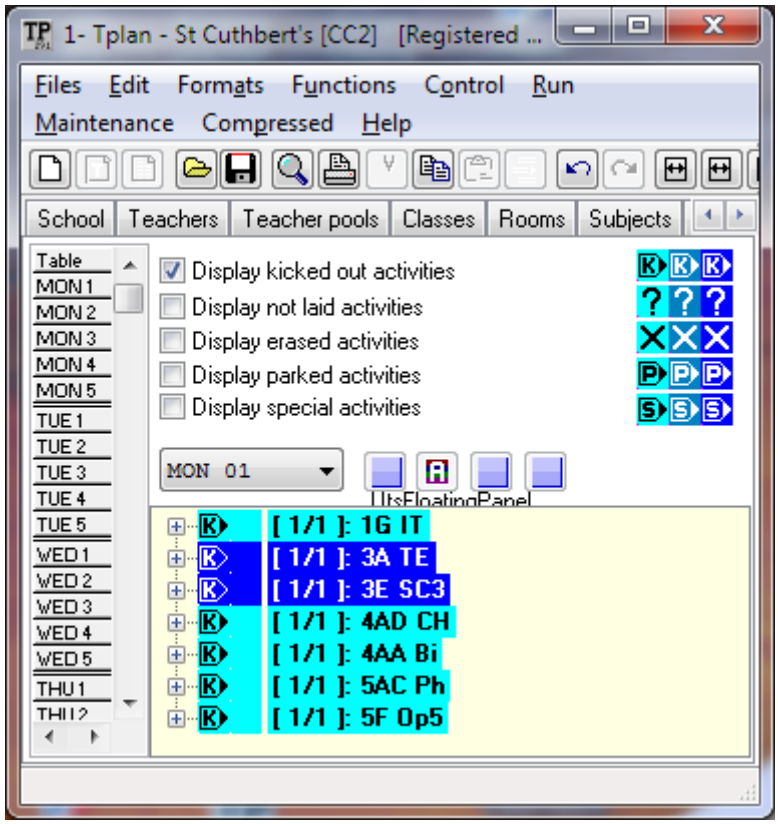
Selection	7AE	CHE	CK
MON 1	7AE Fr MC		
MON 2	7AE FR1 CK		7AE
MON 3	7AE DE JHA	3C	6AE
MON 4	7AE SS MTU	4AA	4AA
MON 5	7AE FR CK		7AE
TUE 1	7AE Fr MC		
TUE 2	7AE FR1 CK		7AE
TUE 3	7AE Ss NM		
TUE 4	7AE DE JHA		3H
TUE 5			5AA
WED 1	7AE FR1 CK		7AE
WED 2	7AE Ss NM		3H
WED 3			5AA
WED 4	7AE Fr1 CHE	7AE	
WED 5	7AE SS MTU	3C	
THU 1	7AE DE JHA		6AE
THU 2	7AE SS MTU	4AA	4AA
THU 3			3H
THU 4	7AE De LF	7AB	
THU 5	7AE Fr MC		5AA
FRI 1	7AE FR CK		7AE
FRI 2	7AE FR1 CK		7AE
FRI 3	7AE SS MTU		
FRI 4			5AA
FRI 5			6AE
mon 1	7AE DE JHA	7AB	
mon 2	7AE SS MTU		
mon 3	7AE Fr MC		
mon 4		4AA	4AA
mon 5	7AE De LF		6AE
tue 1	7AE De LF	7AB	
tue 2	7AE Fr1 CHE	7AE	
tue 3	7AE FR CK	3C	7AE
tue 4	7AE Ss NM		
tue 5	7AE DE JHA		
wed 1	7AE FR CK		7AE
wed 2	7AE FR1 CK		7AE
wed 3	7AA EP MV		5AA
wed 4	7AE Ss NM		
wed 5			
thu 1		4AA	4AA
thu 2	7AE DE JHA		
thu 3			
thu 4	7AE Fr1 CHE	7AE	
thu 5	7AE Fr MC		
fri 1	7AE FR CK	3C	7AE
fri 2	7AE Ss NM		
fri 3	7AE Fr1 CHE	7AE	3H
fri 4	7AA EP MV	4AA	4AA
fri 5	7AE DE JHA		

FRI 5 should be dark green in this figure and 7AE Fr1 may directly be assigned here. (The subject is probably lacking a suitable room to be found later.). Next we investigate 7AG TM and get this selection:

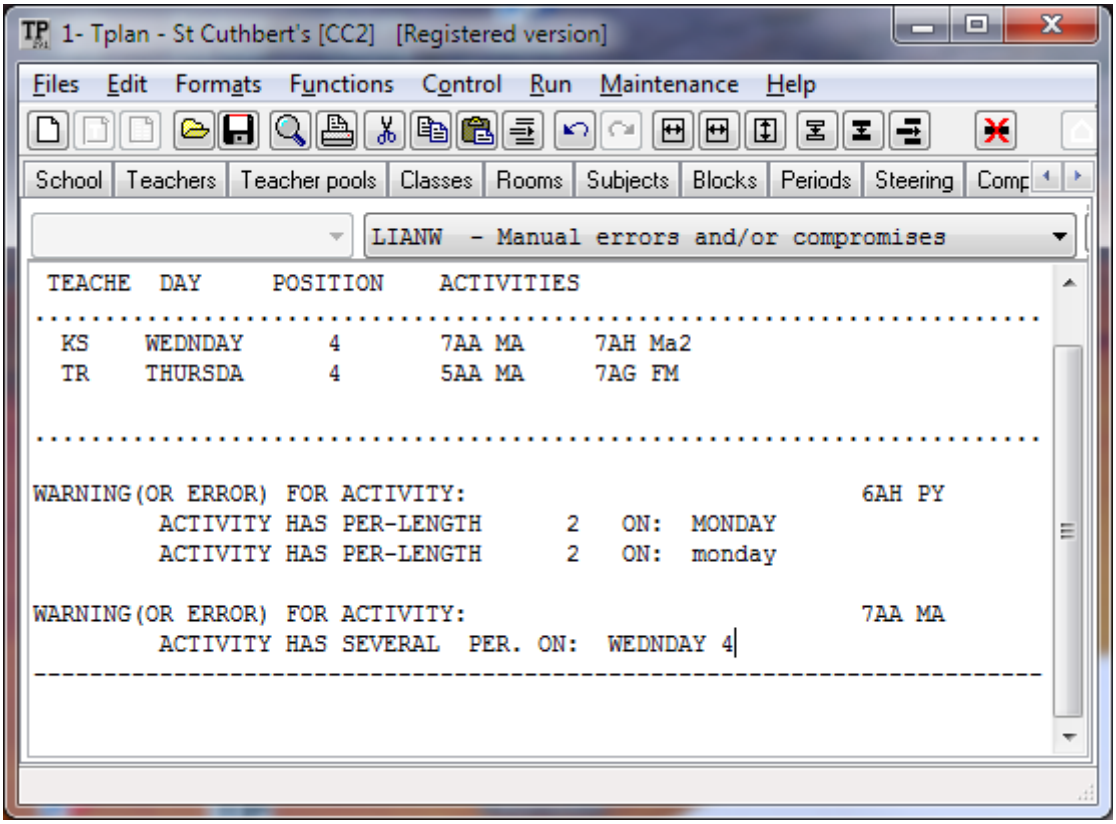


Selection	7AG	KS	KS	TR	TR
MON 1		6AG		4AA	
MON 2	7AG it1 PV IT6			7AH	
MON 3	7AG Fm KS	7AG		5E	
MON 4		5AA		5AA	
MON 5	7AG GE JC LA4			6AH	
TUE 1	7AG GE JC LA4			4AA	
TUE 2	7AG It1 TS IT5	7AA		7AH	
TUE 3	7AG It TS IT4	6AG		5E	
TUE 4	7AG Fm KS	7AG		6AH	
TUE 5	7AG IT1 GL IT6	7AH			
WED 1		7AA		7AH	
WED 2	7AG IT PV IT6	5AA		5AA	
WED 3	7AG GE JC LA4	6AA		6AH	
WED 4	7AG It1 TS IT5	7AH		4AA	
WED 5				6AA	
THU 1	7AG Fm KS	7AG		4AA	
THU 2	7AG IT PV IT6				
THU 3					
THU 4	7AG FM TR	5AA		5AA	7AG
THU 5	7AG GE JC LA4			6AH	
FRI 1	7AG GE JC LA4	6AA		4AA	
FRI 2	7AG It1 TS IT4	7AA	7AH	6AH	
FRI 3	7AG IT PV IT6	5AA		5AA	
FRI 4	7AG FM TR			7AG	
FRI 5	7AG IT1 GL IT4			7AH	
mon 1	7AG Fm KS	7AG			
mon 2	7AG It TS IT4	6AG		5E	
mon 3	7AG GE JC LA4			4AA	
mon 4	7AG it1 PV IT6	7AH			
mon 5		5AA		5AA	
tue 1	7AG Fm KS	7AG		5E	
tue 2	7AG IT1 GL IT4			7AH	
tue 3	7AG GE JC LA4	6AG		4AA	
tue 4	7AG It TS IT4			6AH	
tue 5	7AG FM TR			7AG	
wed 1	7AG GE JC LA4			5E	
wed 2		7AA			
wed 3	7AA EP	6AA		6AH	
wed 4	7AG It TS IT4	5AA		5AA	
wed 5				6AA	
thu 1	7AG IT PV IT4			6AH	
thu 2	7AG FM TR			7AG	
thu 3	7AG It TS IT4	6AG			
thu 4	7AG it1 PV IT6	5AA		5AA	
thu 5	7AG GE JC LA4				
fri 1	7AG GE JC LA4			6AH	
fri 2	7AG IT PV IT4	6AA		5E	
fri 3	7AG it1 PV IT6	7AH			
fri 4	7AA EP				
fri 5	7AG FM TR			7AG	

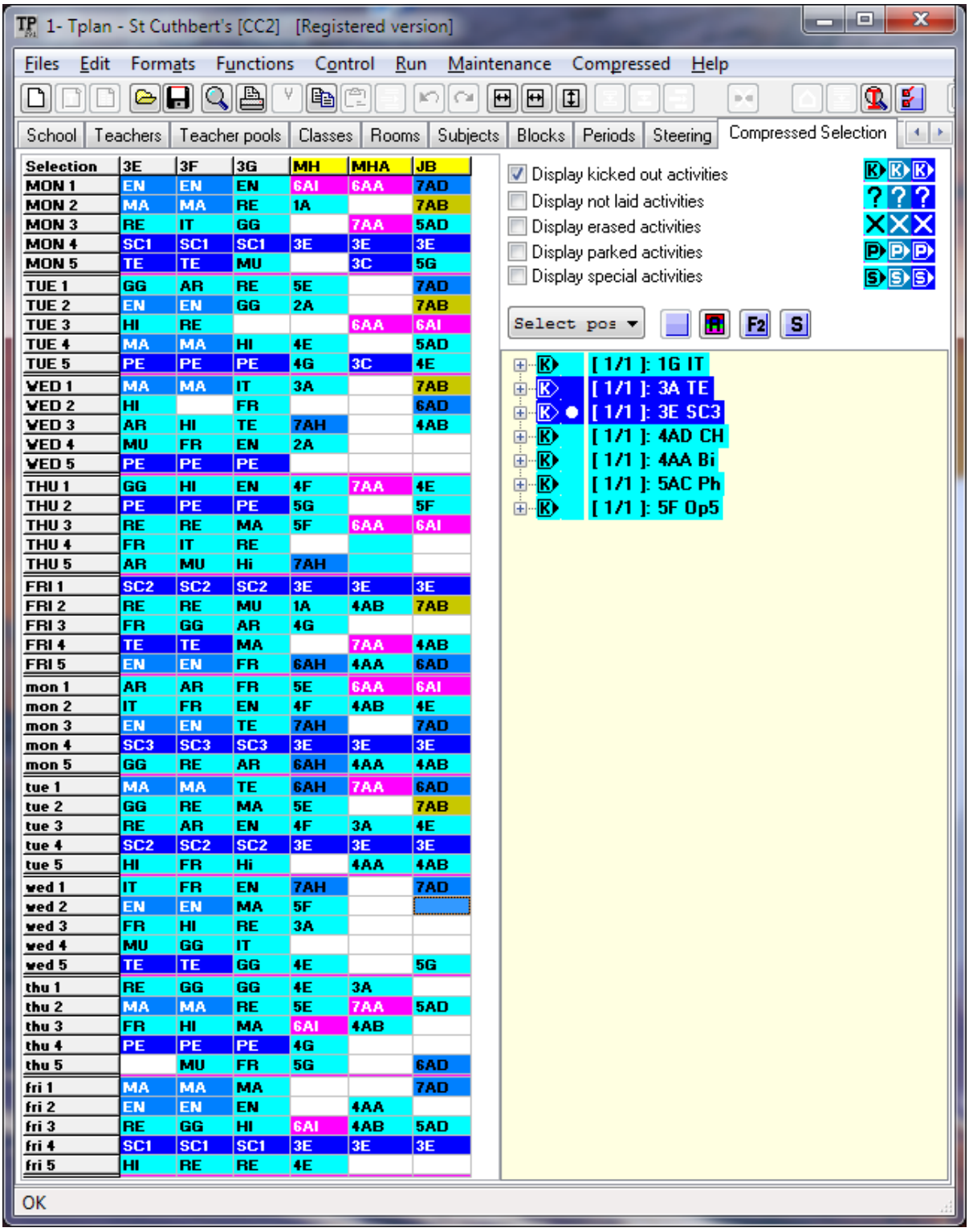
We must look for empty pink cells for 7AG. Those are found in THU 4 and mon 5. In both periods both KS and TR are in a option blocks in 5th form. (A not unfamiliar situation.) We must do a compromise and in the above figure we double assign TR in THU 4. Our kickout list has now been changed to:



The compromises done till now is shown in LIANW:

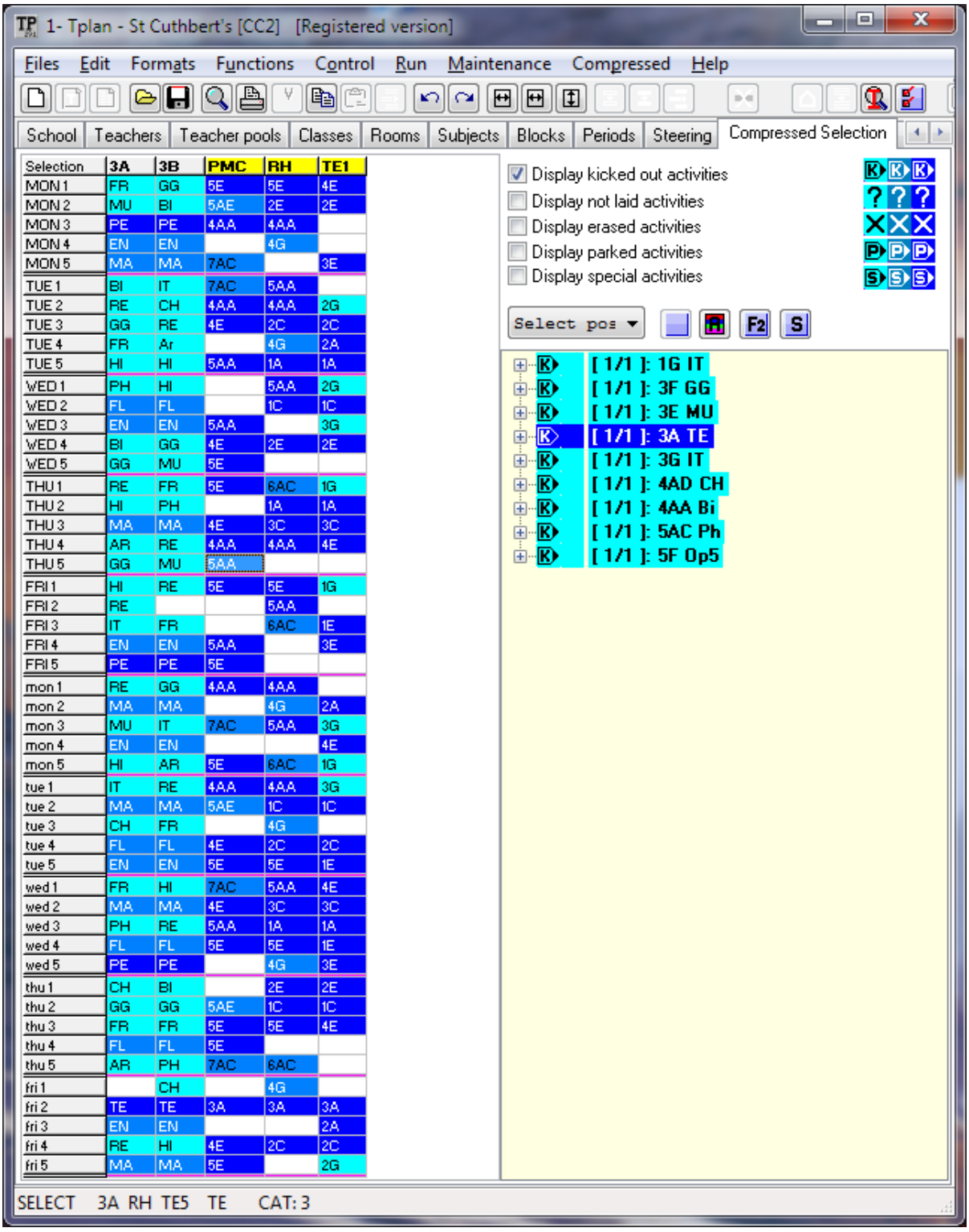


The double assignments here is the result of our drag/drop while the double period in 6AH is caused by presassignment in period register. To sort out remaining kickouts we could either start with pure class act. in form 4-5 or blocks in form 3. I prefer the latter. I start with 3E SC3 and get the following selection. (Category: Only activity):



Selection	3E	3F	3G	MH	MHA	JB
MON 1	EN	EN	EN	6AI	6AA	7AD
MON 2	MA	MA	RE	1A		7AB
MON 3	RE	IT	GG		7AA	5AD
MON 4	SC1	SC1	SC1	3E	3E	3E
MON 5	TE	TE	MU		3C	5G
TUE 1	GG	AR	RE	5E		7AD
TUE 2	EN	EN	GG	2A		7AB
TUE 3	HI	RE			6AA	6AI
TUE 4	MA	MA	HI	4E		5AD
TUE 5	PE	PE	PE	4G	3C	4E
WED 1	MA	MA	IT	3A		7AB
WED 2	HI		FR			6AD
WED 3	AR	HI	TE	7AH		4AB
WED 4	MU	FR	EN	2A		
WED 5	PE	PE	PE			
THU 1	GG	HI	EN	4F	7AA	4E
THU 2	PE	PE	PE	5G		5F
THU 3	RE	RE	MA	5F	6AA	6AI
THU 4	FR	IT	RE			
THU 5	AR	MU	Hi	7AH		
FRI 1	SC2	SC2	SC2	3E	3E	3E
FRI 2	RE	RE	MU	1A	4AB	7AB
FRI 3	FR	GG	AR	4G		
FRI 4	TE	TE	MA		7AA	4AB
FRI 5	EN	EN	FR	6AH	4AA	6AD
mon 1	AR	AR	FR	5E	6AA	6AI
mon 2	IT	FR	EN	4F	4AB	4E
mon 3	EN	EN	TE	7AH		7AD
mon 4	SC3	SC3	SC3	3E	3E	3E
mon 5	GG	RE	AR	6AH	4AA	4AB
tue 1	MA	MA	TE	6AH	7AA	6AD
tue 2	GG	RE	MA	5E		7AB
tue 3	RE	AR	EN	4F	3A	4E
tue 4	SC2	SC2	SC2	3E	3E	3E
tue 5	HI	FR	Hi		4AA	4AB
wed 1	IT	FR	EN	7AH		7AD
wed 2	EN	EN	MA	5F		
wed 3	FR	HI	RE	3A		
wed 4	MU	GG	IT			
wed 5	TE	TE	GG	4E		5G
thu 1	RE	GG	GG	4E	3A	
thu 2	MA	MA	RE	5E	7AA	5AD
thu 3	FR	HI	MA	6AI	4AB	
thu 4	PE	PE	PE	4G		
thu 5		MU	FR	5G		6AD
fri 1	MA	MA	MA			7AD
fri 2	EN	EN	EN		4AA	
fri 3	RE	GG	HI	6AI	4AB	5AD
fri 4	SC1	SC1	SC1	3E	3E	3E
fri 5	HI	RE	RE	4E		

If we investigate this figure we find one reasonable possibility: wed 4. Here all actual teachers are available while actual classes have pure class act. which then is transferred to the kickout list. We then use the same technique for 3A TE and get this selection:



Selection	3A	3B	PMC	RH	TE1
MON 1	FR	GG	5E	5E	4E
MON 2	MU	BI	5AE	2E	2E
MON 3	PE	PE	4AA	4AA	
MON 4	EN	EN		4G	
MON 5	MA	MA	7AC		3E
TUE 1	BI	IT	7AC	5AA	
TUE 2	RE	CH	4AA	4AA	2G
TUE 3	GG	RE	4E	2C	2C
TUE 4	FR	Ar		4G	2A
TUE 5	HI	HI	5AA	1A	1A
WED 1	PH	HI		5AA	2G
WED 2	FL	FL		1C	1C
WED 3	EN	EN	5AA		3G
WED 4	BI	GG	4E	2E	2E
WED 5	GG	MU	5E		
THU 1	RE	FR	5E	6AC	1G
THU 2	HI	PH		1A	1A
THU 3	MA	MA	4E	3C	3C
THU 4	AR	RE	4AA	4AA	4E
THU 5	GG	MU	5AA		
FRI 1	HI	RE	5E	5E	1G
FRI 2	RE			5AA	
FRI 3	IT	FR		6AC	1E
FRI 4	EN	EN	5AA		3E
FRI 5	PE	PE	5E		
mon 1	RE	GG	4AA	4AA	
mon 2	MA	MA		4G	2A
mon 3	MU	IT	7AC	5AA	3G
mon 4	EN	EN			4E
mon 5	HI	AR	5E	6AC	1G
tue 1	IT	RE	4AA	4AA	3G
tue 2	MA	MA	5AE	1C	1C
tue 3	CH	FR		4G	
tue 4	FL	FL	4E	2C	2C
tue 5	EN	EN	5E	5E	1E
wed 1	FR	HI	7AC	5AA	4E
wed 2	MA	MA	4E	3C	3C
wed 3	PH	RE	5AA	1A	1A
wed 4	FL	FL	5E	5E	1E
wed 5	PE	PE		4G	3E
thu 1	CH	BI		2E	2E
thu 2	GG	GG	5AE	1C	1C
thu 3	FR	FR	5E	5E	4E
thu 4	FL	FL	5E		
thu 5	AR	PH	7AC	6AC	
fri 1		CH		4G	
fri 2	TE	TE	3A	3A	3A
fri 3	EN	EN			2A
fri 4	RE	HI	4E	2C	2C
fri 5	MA	MA	5E		2G

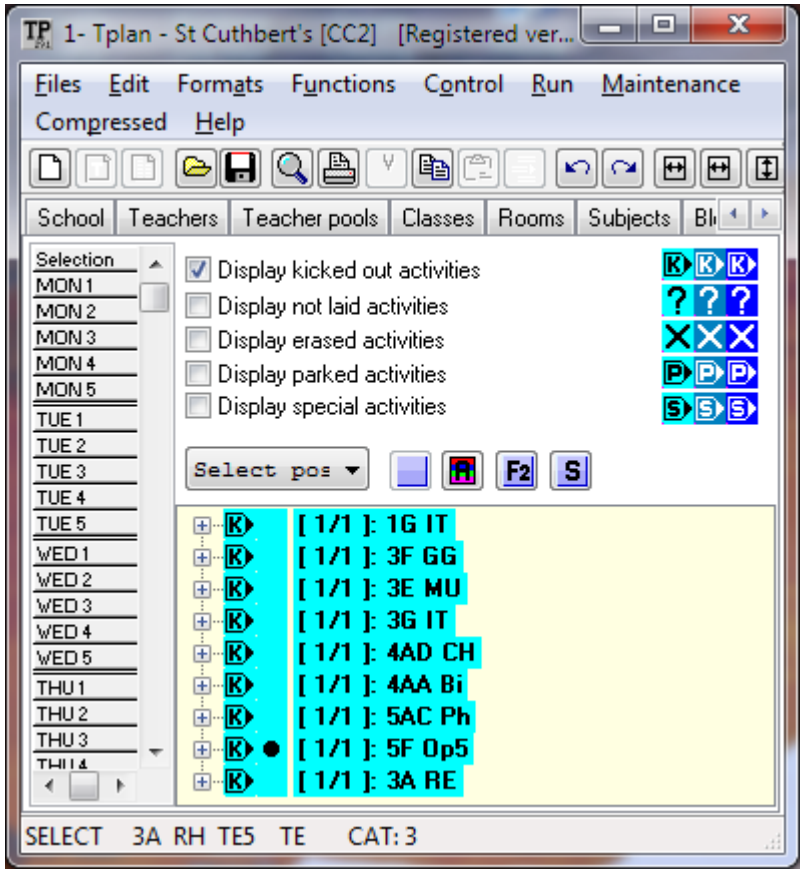
Due to the actual teachers being involved in a lot of blocks, it is not easy to see a reasonable period for 3A TE. FRI 2 appear to be the simplest one: We transfer 3A RE to kickout list and then double assign teacher RH (to be adjusted later). Our current kickout list is now:

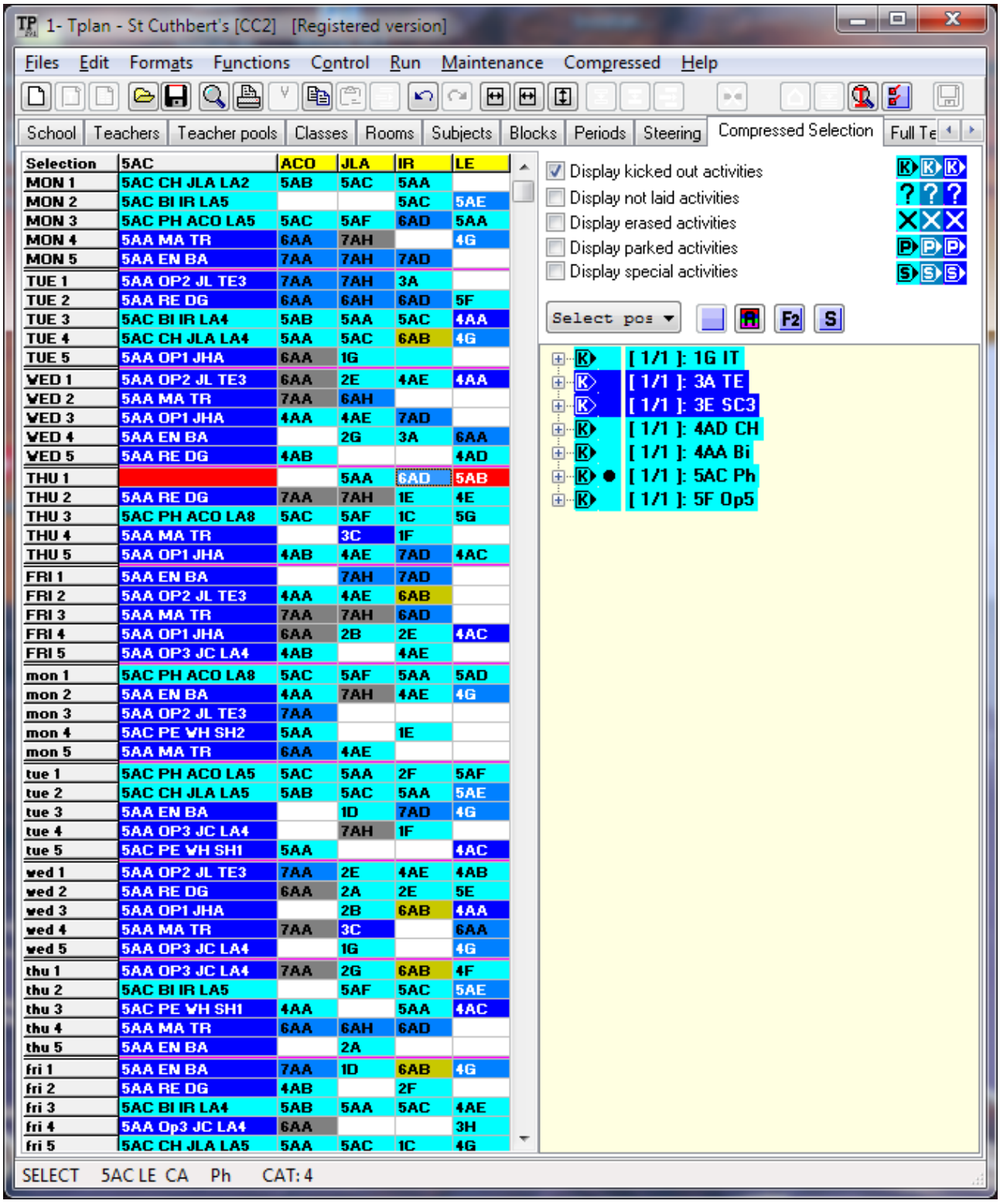
I am happier with this list than the previous one since we only have pure class activities remaining.

It is to longwinded to show all steps in this adjustment, but I will show a few typical techniques.

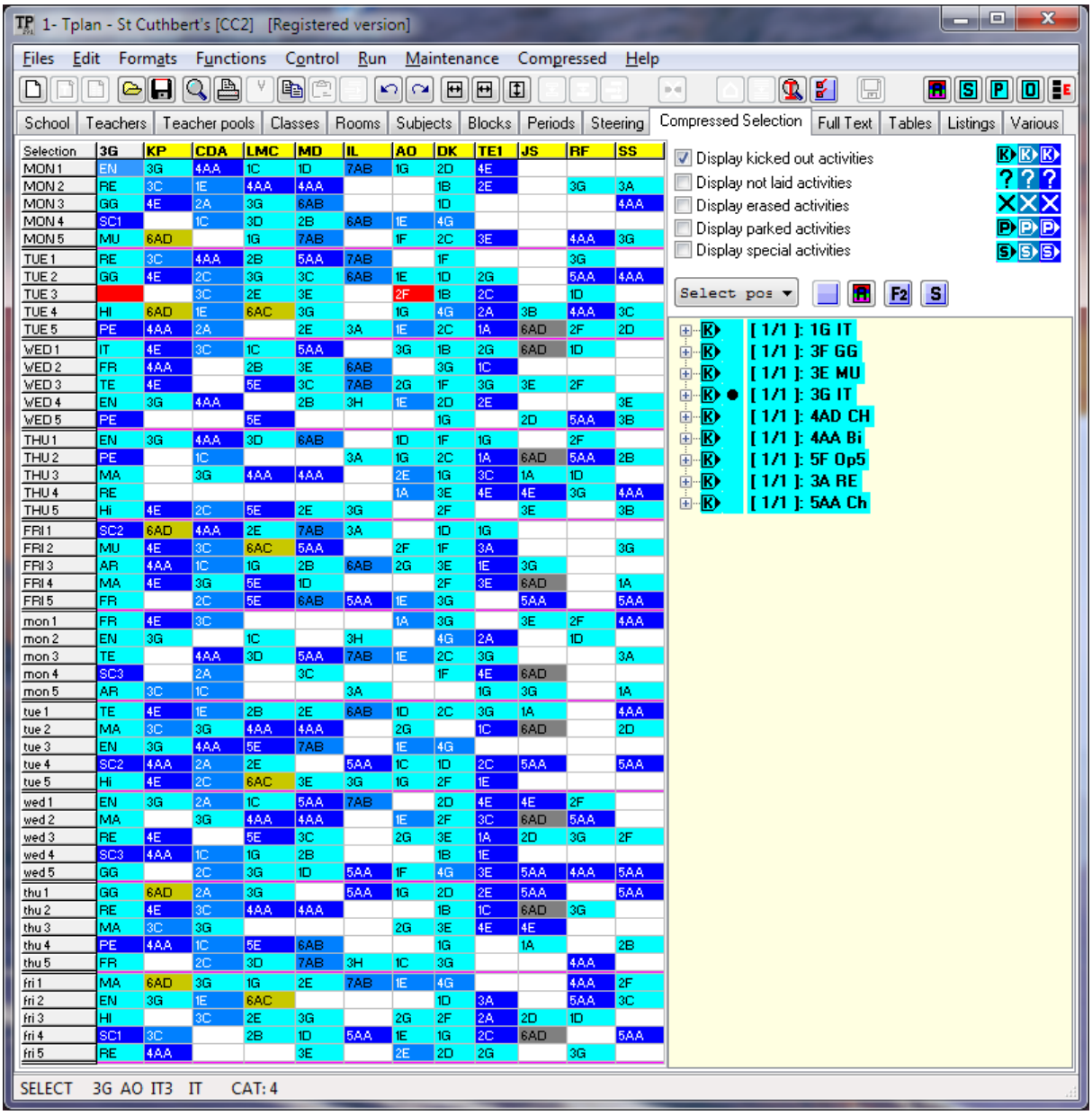
I start with subject 5AC Ph.

I make a selection of this activity.
(Category = Pure class for remaining examples in this chapter)



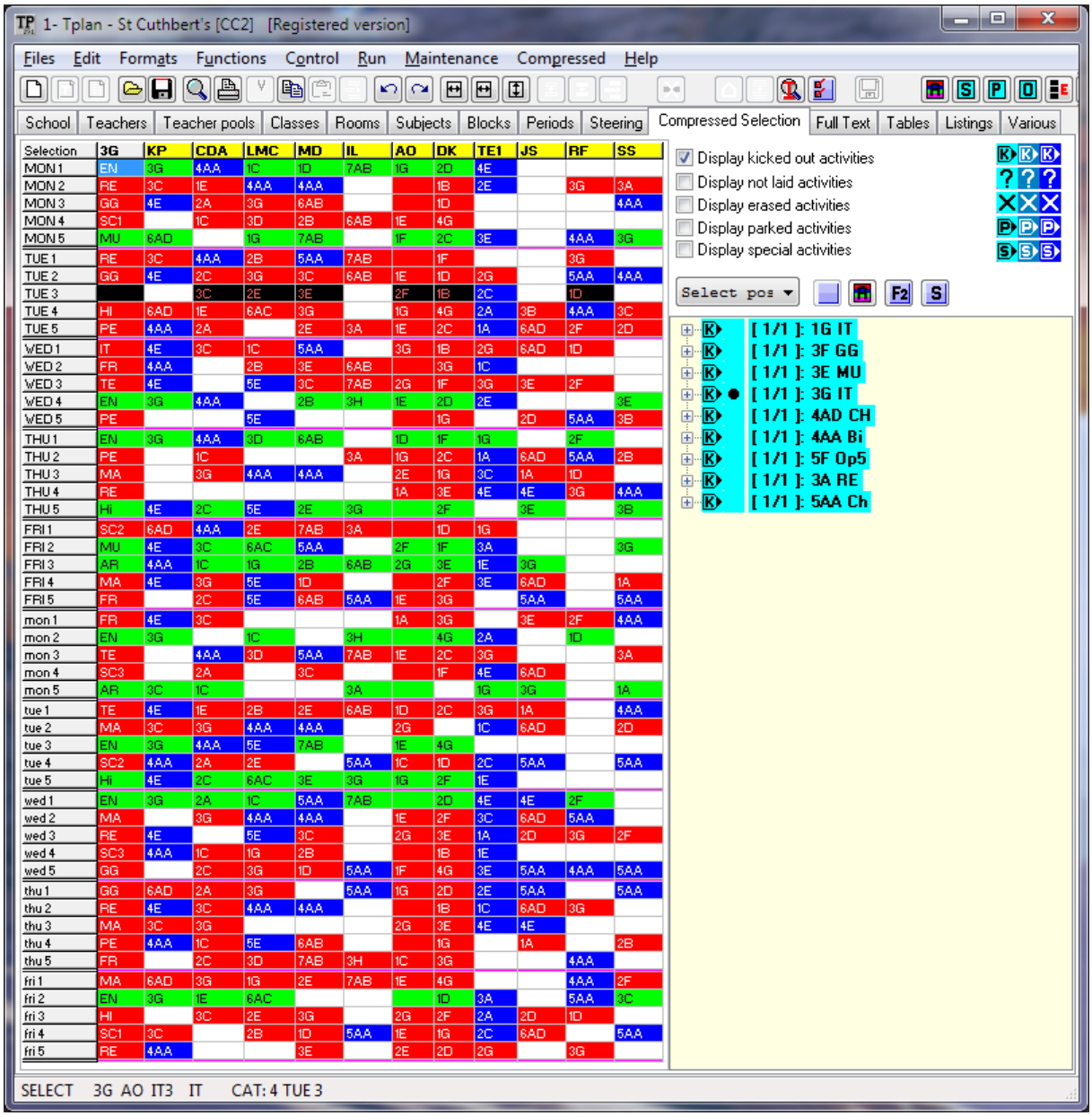


The interesting period is THU 1 where 5AC is available while LE is booked. ACO could possibly teach here. As luck would have it we immediately spot a solution: ACO in MON 1 may be interchanged with LE in THU1 (both are teaching pure class in 5AB in those periods).We does that interchange and 5AC Ph may be assigned in THU 1. I could show that this adjustment gives a room conflict. In any case it is more seldom you see directly a possibility and later examples will show a more general way of doing such adjustments. Next I try to adjust 3G IT and get this selection:



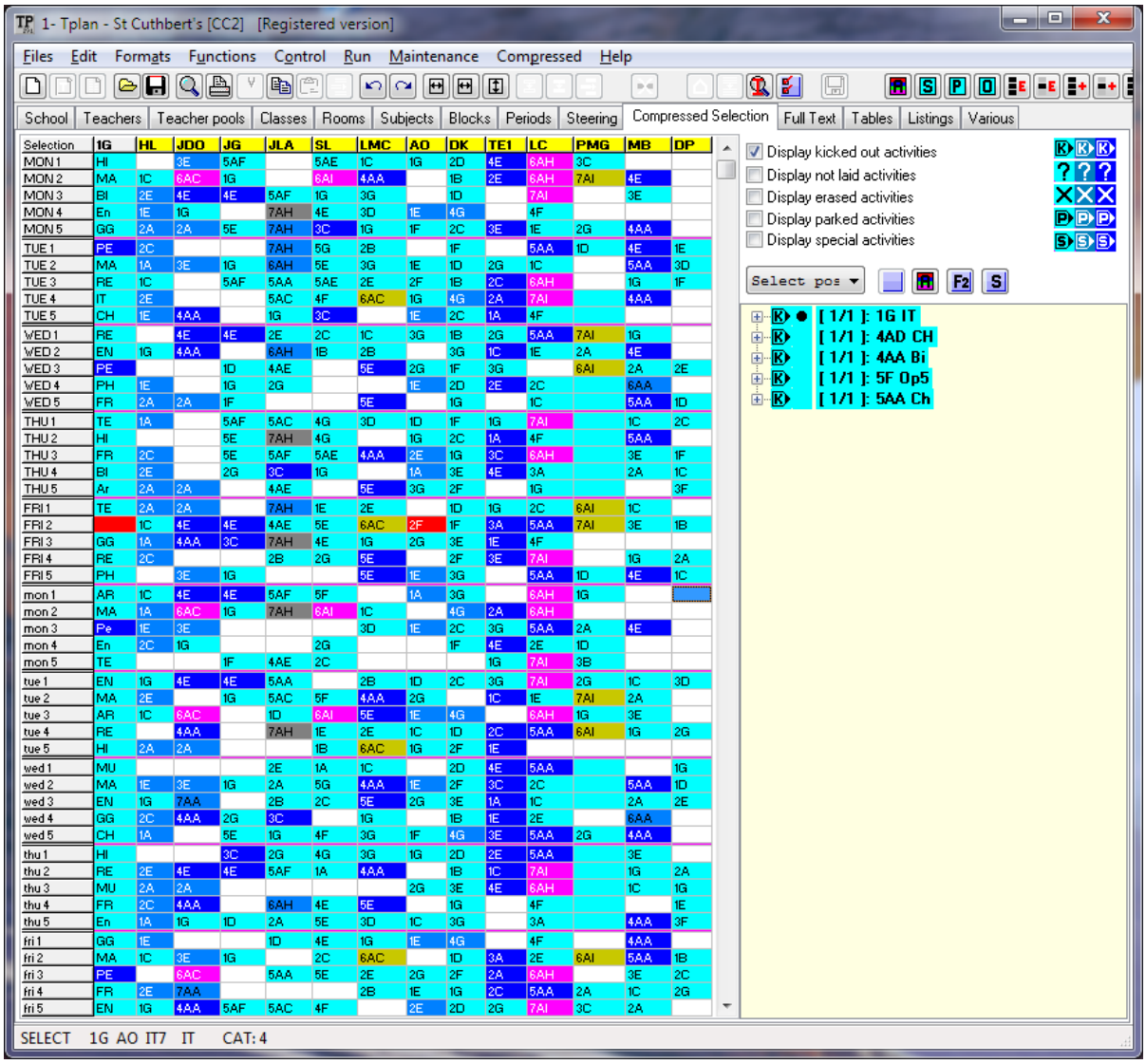
Selection	3G	KP	CDA	LMC	MD	IL	AO	DK	TE1	JS	RF	SS
MON 1	EN	3G	4AA	1C	1D	7AB	1G	2D	4E			
MON 2	RE	3C	1E	4AA	4AA			1B	2E		3G	3A
MON 3	GG	4E	2A	3G	6AB			1D				4AA
MON 4	SC1		1C	3D	2B	6AB	1E	4G				
MON 5	MU	6AD		1G	7AB		1F	2C	3E		4AA	3G
TUE 1	RE	3C	4AA	2B	5AA	7AB		1F			3G	
TUE 2	GG	4E	2C	3G	3C	6AB	1E	1D	2G		5AA	4AA
TUE 3			3C	2E	3E		2F	1B	2C		1D	
TUE 4	HI	6AD	1E	6AC	3G		1G	4G	2A	3B	4AA	3C
TUE 5	PE	4AA	2A		2E	3A	1E	2C	1A	6AD	2F	2D
WED 1	IT	4E	3C	1C	5AA		3G	1B	2G	6AD	1D	
WED 2	FR	4AA		2B	3E	6AB		3G	1C			
WED 3	TE	4E		5E	3C	7AB	2G	1F	3G	3E	2F	
WED 4	EN	3G	4AA		2B	3H	1E	2D	2E			3E
WED 5	PE			5E				1G		2D	5AA	3B
THU 1	EN	3G	4AA	3D	6AB		1D	1F	1G		2F	
THU 2	PE		1C			3A	1G	2C	1A	6AD	5AA	2B
THU 3	MA		3G	4AA	4AA		2E	1G	3C	1A	1D	
THU 4	RE						1A	3E	4E	4E	3G	4AA
THU 5	Hi	4E	2C	5E	2E	3G		2F		3E		3B
FRI 1	SC2	6AD	4AA	2E	7AB	3A		1D	1G			
FRI 2	MU	4E	3C	6AC	5AA		2F	1F	3A			3G
FRI 3	AR	4AA	1C	1G	2B	6AB	2G	3E	1E	3G		
FRI 4	MA	4E	3G	5E	1D			2F	3E	6AD		1A
FRI 5	FR		2C	5E	6AB	5AA	1E	3G		5AA		5AA
mon 1	FR	4E	3C				1A	3G		3E	2F	4AA
mon 2	EN	3G		1C		3H		4G	2A		1D	
mon 3	TE		4AA	3D	5AA	7AB	1E	2C	3G			3A
mon 4	SC3		2A		3C			1F	4E	6AD		
mon 5	AR	3C	1C			3A			1G	3G		1A
tue 1	TE	4E	1E	2B	2E	6AB	1D	2C	3G	1A		4AA
tue 2	MA	3C	3G	4AA	4AA		2G		1C	6AD		2D
tue 3	EN	3G	4AA	5E	7AB		1E	4G				
tue 4	SC2	4AA	2A	2E		5AA	1C	1D	2C	5AA		5AA
tue 5	Hi	4E	2C	6AC	3E	3G	1G	2F	1E			
wed 1	EN	3G	2A	1C	5AA	7AB		2D	4E	4E	2F	
wed 2	MA		3G	4AA	4AA		1E	2F	3C	6AD	5AA	
wed 3	RE	4E		5E	3C		2G	3E	1A	2D	3G	2F
wed 4	SC3	4AA	1C	1G	2B			1B	1E			
wed 5	GG		2C	3G	1D	5AA	1F	4G	3E	5AA	4AA	5AA
thu 1	GG	6AD	2A	3G		5AA	1G	2D	2E	5AA		5AA
thu 2	RE	4E	3C	4AA	4AA			1B	1C	6AD	3G	
thu 3	MA	3C	3G				2G	3E	4E	4E		
thu 4	PE	4AA	1C	5E	6AB			1G		1A		2B
thu 5	FR		2C	3D	7AB	3H	1C	3G			4AA	
fri 1	MA	6AD	3G	1G	2E	7AB	1E	4G			4AA	2F
fri 2	EN	3G	1E	6AC				1D	3A		5AA	3C
fri 3	HI		3C	2E	3G		2G	2F	2A	2D	1D	
fri 4	SC1	3C		2B	1D	5AA	1E	1G	2C	6AD		5AA
fri 5	RE	4AA			3E		2E	2D	2G		3G	

The problematic period is TUE 3 where 3G is available while AO is booked. I make the same selection as above but include TUE 3 as Actual position. The result is:

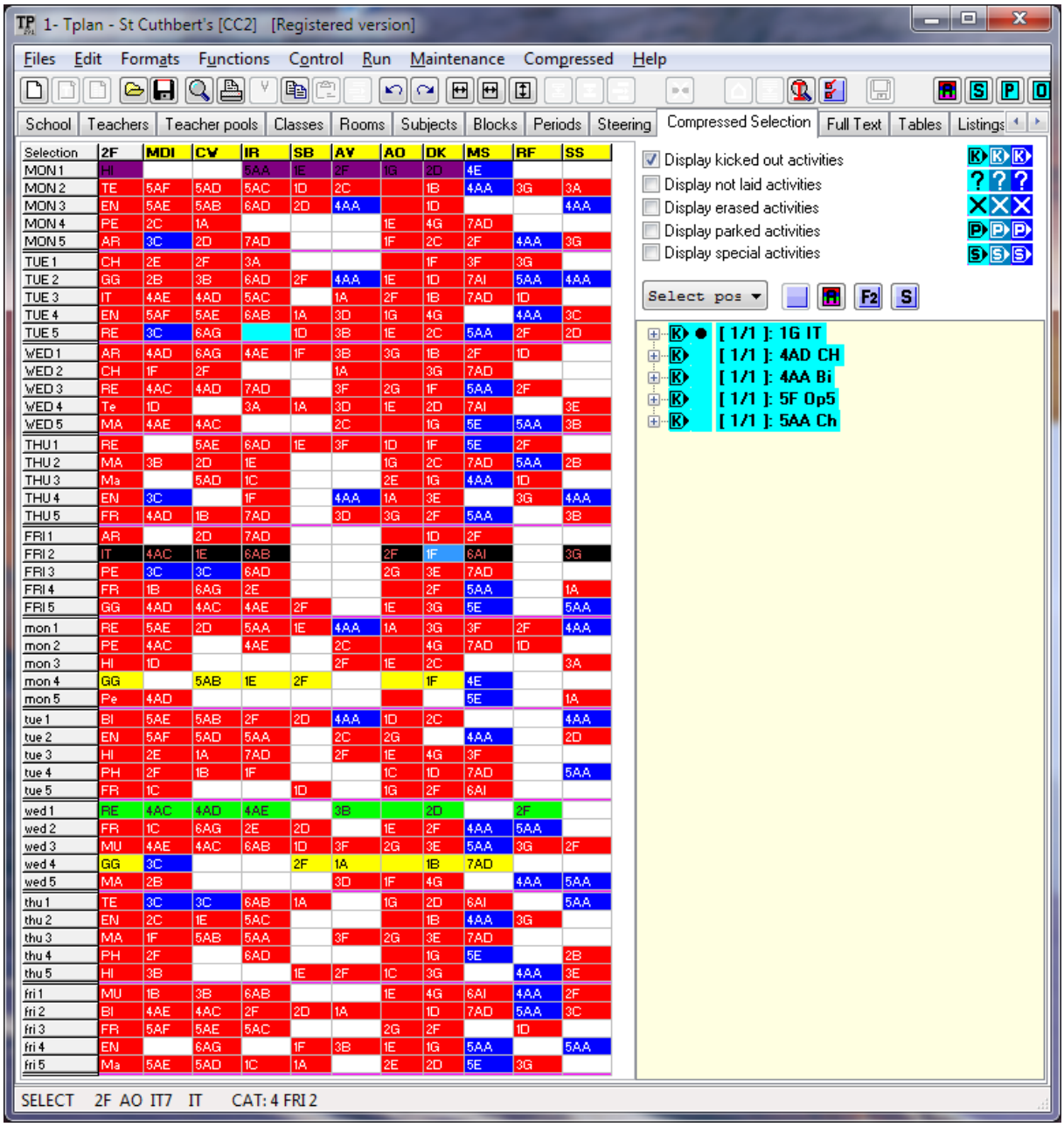


The green periods here are those which may be interchanged with TUE 3. In addition we want to find a green period where AO is available meaning that 3G IT may be assigned there. That is fulfilled for THU 5 (amongst several others) and we select that interchange and 3G IT is then assigned in THU 5.

Next we select 1G IT and get this selection:



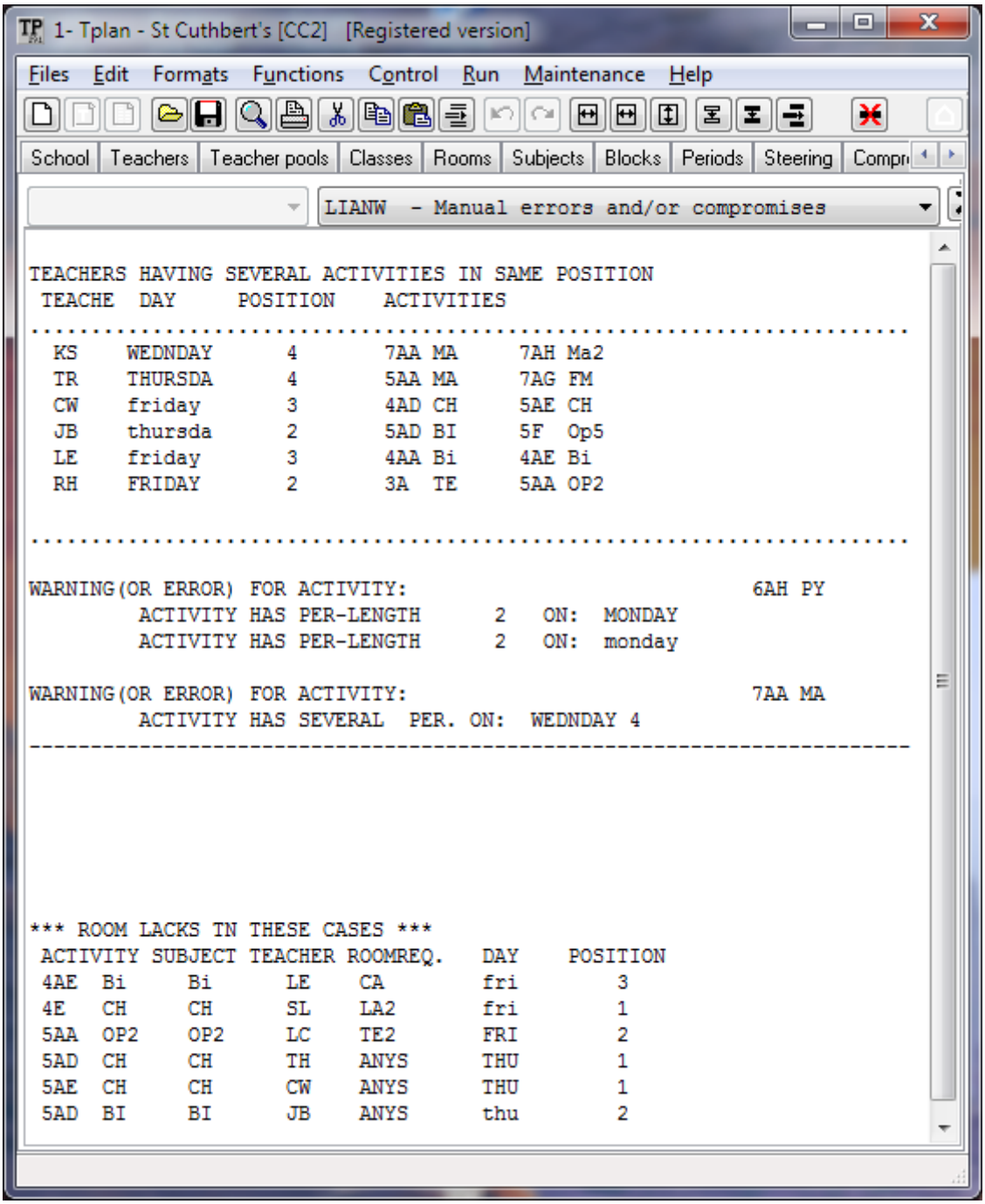
This is a more complicated case. The critical period is FRI 2 but we notice that all teachers for 1G in pure class act. are booked in this period meaning an interchange won't help us. The next possibility is to try to free AO in FRI 2. We select teacher AO in FRI 2 and get this selection:



Selection	2F	MDI	CW	IR	SB	AV	AO	DK	MS	RF	SS
MON 1	HI			5AA	1E	2F	1G	2D	4E		
MON 2	TE	5AF	5AD	5AC	1D	2C		1B	4AA	3G	3A
MON 3	EN	5AE	5AB	6AD	2D	4AA		1D			4AA
MON 4	PE	2C	1A				1E	4G	7AD		
MON 5	AR	3C	2D	7AD			1F	2C	2F	4AA	3G
TUE 1	CH	2E	2F	3A				1F	3F	3G	
TUE 2	GG	2B	3B	6AD	2F	4AA	1E	1D	7AI	5AA	4AA
TUE 3	IT	4AE	4AD	5AC		1A	2F	1B	7AD	1D	
TUE 4	EN	5AF	5AE	6AB	1A	3D	1G	4G		4AA	3C
TUE 5	RE	3C	6AG		1D	3B	1E	2C	5AA	2F	2D
WED 1	AR	4AD	6AG	4AE	1F	3B	3G	1B	2F	1D	
WED 2	CH	1F	2F			1A		3G	7AD		
WED 3	RE	4AC	4AD	7AD		3F	2G	1F	5AA	2F	
WED 4	Te	1D		3A	1A	3D	1E	2D	7AI		3E
WED 5	MA	4AE	4AC			2C		1G	5E	5AA	3B
THU 1	RE		5AE	6AD	1E	3F	1D	1F	5E	2F	
THU 2	MA	3B	2D	1E			1G	2C	7AD	5AA	2B
THU 3	Ma		5AD	1C			2E	1G	4AA	1D	
THU 4	EN	3C		1F		4AA	1A	3E		3G	4AA
THU 5	FR	4AD	1B	7AD		3D	3G	2F	5AA		3B
FRI 1	AR		2D	7AD				1D	2F		
FRI 2	IT	4AC	1E	6AB			2F	1F	6AI		3G
FRI 3	PE	3C	3C	6AD			2G	3E	7AD		
FRI 4	FR	1B	6AG	2E				2F	5AA		1A
FRI 5	GG	4AD	4AC	4AE	2F		1E	3G	5E		5AA
mon 1	RE	5AE	2D	5AA	1E	4AA	1A	3G	3F	2F	4AA
mon 2	PE	4AC		4AE		2C		4G	7AD	1D	
mon 3	HI	1D				2F	1E	2C			3A
mon 4	GG		5AB	1E	2F			1F	4E		
mon 5	Pe	4AD							5E		1A
tue 1	BI	5AE	5AB	2F	2D	4AA	1D	2C			4AA
tue 2	EN	5AF	5AD	5AA		2C	2G		4AA		2D
tue 3	HI	2E	1A	7AD		2F	1E	4G	3F		
tue 4	PH	2F	1B	1F			1C	1D	7AD		5AA
tue 5	FR	1C			1D		1G	2F	6AI		
wed 1	RE	4AC	4AD	4AE		3B		2D		2F	
wed 2	FR	1C	6AG	2E	2D		1E	2F	4AA	5AA	
wed 3	MU	4AE	4AC	6AB	1D	3F	2G	3E	5AA	3G	2F
wed 4	GG	3C			2F	1A		1B	7AD		
wed 5	MA	2B				3D	1F	4G		4AA	5AA
thu 1	TE	3C	3C	6AB	1A		1G	2D	6AI		5AA
thu 2	EN	2C	1E	5AC				1B	4AA	3G	
thu 3	MA	1F	5AB	5AA		3F	2G	3E	7AD		
thu 4	PH	2F		6AD				1G	5E		2B
thu 5	HI	3B			1E	2F	1C	3G		4AA	3E
fri 1	MU	1B	3B	6AB			1E	4G	6AI	4AA	2F
fri 2	BI	4AE	4AC	2F	2D	1A		1D	7AD	5AA	3C
fri 3	FR	5AF	5AE	5AC			2G	2F		1D	
fri 4	EN		6AG		1F	3B	1E	1G	5AA		5AA
fri 5	Ma	5AE	5AD	1C	1A		2E	2D	5E	3G	

Green periods are the most interesting (while yellow ones could also be used breaking a day conflict). As luck would have it wed 1 is green and teacher AO is also available here and we of course do that interchange and then assign 1G IT in FRI 2

I will not show further adjustments, but I completed this timetable with these error messages (LIANW):



There is still a way to go with some teacher changes and to find lacking rooms. I am far from ashamed of this result for a fairly large and complex UK school.

I did not do the adjustments in the exact order as explained above and I also skipped some more trivial adjustments. My hope is to give the reader some understanding of how to use Tplan to solve any timetable problem. To sum it up I think that my two last adjustments of 3G IT and 1G IT are the ones teaching you most:

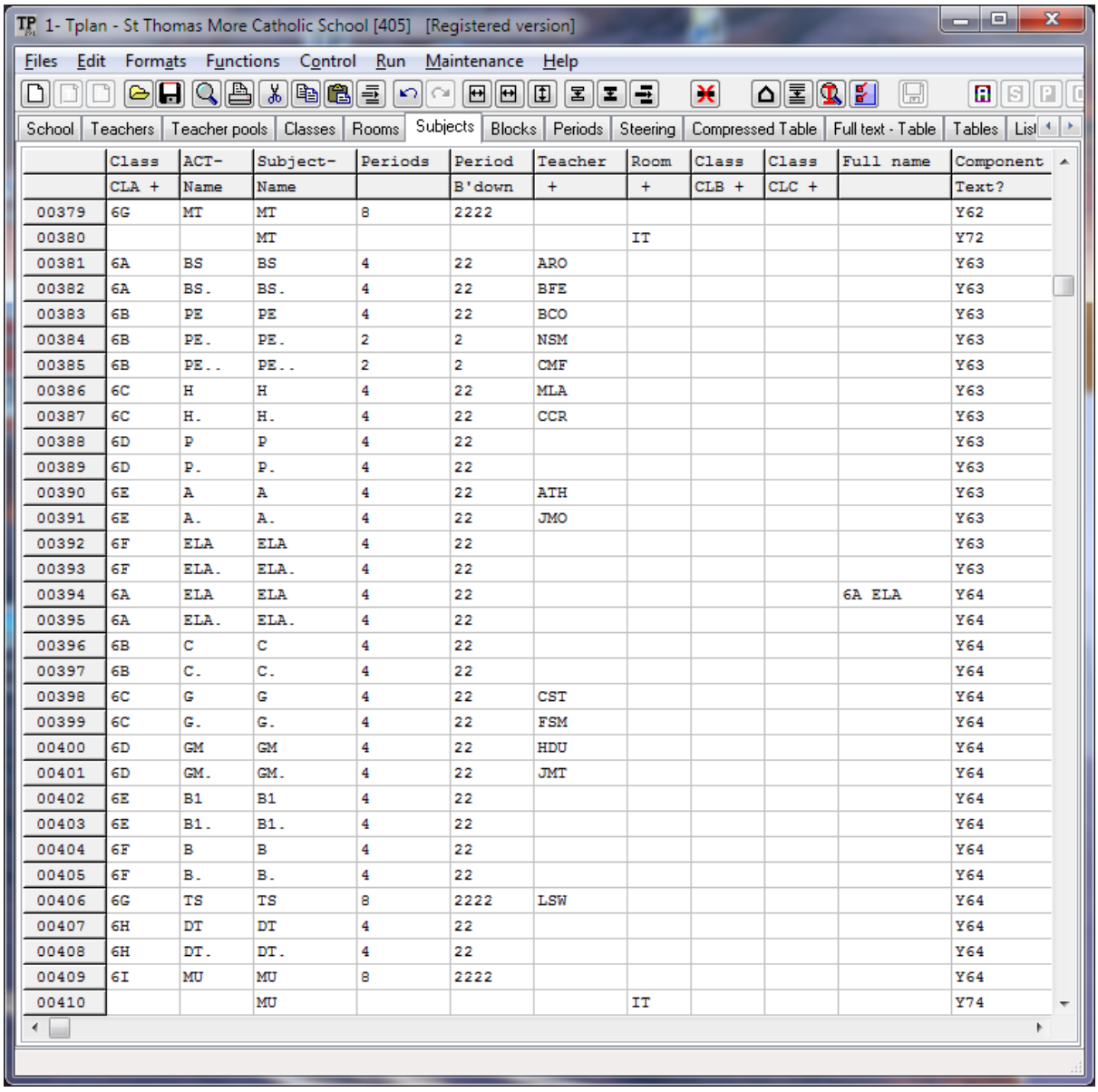
For 3G IT I tried to interchange an available period for a class with some other period hoping to find a period where actual teacher was available.

For 1G IT we also worked with an available period for a class, but here we tried to interchange actual teacher in such a way that he also was available in same period as actual class.

In both cases the colour codes in Tplan told you easily about possible solutions and a few drag/drops adjusted the table. I know that both techniques are the fundamental principles for adjusting ANY timetable. You could of course find a compromise by some other method. However, think how fast proper selections, colour codes and a few drag/drops lead to a sensible solution!

6.4.2 Cross Linking of Components

I have certain reservations with showing this possibility, but I know that such arrangements occur to some extent in real life. My reservations is due to I perfectly well that this might lead to very complex (hopeless?) timetabling if the total timetable data is not good organised. Well here we go. The subject register might look like this:



	Class	ACT-	Subject-	Periods	Period	Teacher	Room	Class	Class	Full name	Component
	CLA +	Name	Name		B'down	+	+	CLB +	CLC +		Text?
00379	6G	MT	MT	8	2222						Y62
00380			MT				IT				Y72
00381	6A	BS	BS	4	22	ARO					Y63
00382	6A	BS.	BS.	4	22	BFE					Y63
00383	6B	PE	PE	4	22	BCO					Y63
00384	6B	PE.	PE.	2	2	NSM					Y63
00385	6B	PE..	PE..	2	2	CMF					Y63
00386	6C	H	H	4	22	MLA					Y63
00387	6C	H.	H.	4	22	CCR					Y63
00388	6D	P	P	4	22						Y63
00389	6D	P.	P.	4	22						Y63
00390	6E	A	A	4	22	ATH					Y63
00391	6E	A.	A.	4	22	JMO					Y63
00392	6F	ELA	ELA	4	22						Y63
00393	6F	ELA.	ELA.	4	22						Y63
00394	6A	ELA	ELA	4	22					6A ELA	Y64
00395	6A	ELA.	ELA.	4	22						Y64
00396	6B	C	C	4	22						Y64
00397	6B	C.	C.	4	22						Y64
00398	6C	G	G	4	22	CST					Y64
00399	6C	G.	G.	4	22	FSM					Y64
00400	6D	GM	GM	4	22	HDU					Y64
00401	6D	GM.	GM.	4	22	JMT					Y64
00402	6E	B1	B1	4	22						Y64
00403	6E	B1.	B1.	4	22						Y64
00404	6F	B	B	4	22						Y64
00405	6F	B.	B.	4	22						Y64
00406	6G	TS	TS	8	2222	LSW					Y64
00407	6H	DT	DT	4	22						Y64
00408	6H	DT.	DT.	4	22						Y64
00409	6I	MU	MU	8	2222						Y64
00410			MU				IT				Y74

The interesting rows here are the two first and the two last. **The subject 6G MT is included in component Y62 and Y72 i.e. form 6 and form 7 is CROSSLINKED. The subject 6I MU is included in included in both Y64 and Y74 i.e. another CROSSLINK. We have a situation where form 6 and 7 is cross linked in both 2nd and 4th component.**

The school in question is perfectly organised regarding work load for teachers; in fact it is a no kickout school. We end up with a timetable like this:

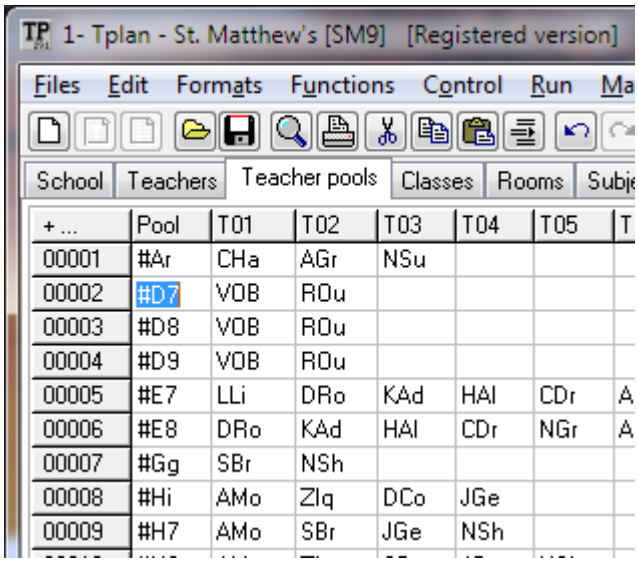
Table	6E	6F	6G	6H	6I	7A	7B
MON 1	6E B1	6F B	6G TS	6H DT	6I MU	7A GM.	7B ELA
MON 2	6E B1	6F B	6G TS	6H DT	6I MU	7A GM.	7B ELA
MON 3	6E A.	6F ELA				7A M	7B B
MON 4	6E A.	6F ELA				7A M	7B B
MON 5	6E B.					7A FM	7B PS
MON 6	6E B.					7A FM	7B PS
MON 7	6E TX.	6F PS.	6G MT			7A RE.	7B C.
MON 8	6E TX.	6F PS.	6G MT			7A RE.	7B C.
TUE 1	6A FMXX	6A FMXX	6A FMXX	6A FMXX	6A FMXX	7A A	7B BS
TUE 2	6A FMXX	6A FMXX	6A FMXX	6A FMXX	6A FMXX	7A A	7B BS
TUE 3	6E B1.	6F B.	6G TS	6H DT.	6I MU	7A GM	7B ELA.
TUE 4	6E B1.	6F B.	6G TS	6H DT.	6I MU	7A GM	7B ELA.
TUE 5	6E TX.	6F PS.	6G MT			7A RE.	7B C.
TUE 6	6E TX.	6F PS.	6G MT			7A RE.	7B C.
TUE 7	6E B					7A M.	7B B.
TUE 8	6E B					7A M.	7B B.
WED 1	6E A	6F ELA				7A A.	7B BS
WED 2	6E A	6F ELA				7A A.	7B BS
WED 3	6E B					7A M.	7B B.
WED 4	6E B					7A M.	7B B.
WED 5	6A CORE	6A CORE	6A CORE	6A CORE	6A CORE	6A CORE	6A CORE
WED 6	6A CORE	6A CORE	6A CORE	6A CORE	6A CORE	6A CORE	6A CORE
WED 7	6A CORE	6A CORE	6A CORE	6A CORE	6A CORE	6A CORE	6A CORE
WED 8	6A CORE	6A CORE	6A CORE	6A CORE	6A CORE	6A CORE	6A CORE
THU 1	6E A	6F ELA.				7A A	7B BS.
THU 2	6E A	6F ELA.				7A A	7B BS.
THU 3	6E TX	6F PS	6G MT			7A RE	7B C
THU 4	6E TX	6F PS	6G MT			7A RE	7B C
THU 5	6E B1	6F B	6G TS	6H DT	6I MU	7A GM	7B ELA
THU 6	6E B1	6F B	6G TS	6H DT	6I MU	7A GM	7B ELA
THU 7	6E B.					7A FM.	7B PS
THU 8	6E B.					7A FM.	7B PS
FRI 1	6A FMXX	6A FMXX	6A FMXX	6A FMXX	6A FMXX	7A A.	7B BS.
FRI 2	6A FMXX	6A FMXX	6A FMXX	6A FMXX	6A FMXX	7A A.	7B BS.
FRI 3	6E A.	6F ELA.				7A M	7B B
FRI 4	6E A.	6F ELA.				7A M	7B B
FRI 5	6E TX	6F PS	6G MT			7A RE	7B C
FRI 6	6E TX	6F PS	6G MT			7A RE	7B C
FRI 7	6E B1.	6F B.	6G TS	6H DT.	6I MU	7A GM..	7B ELA.
FRI 8	6E B1.	6F B.	6G TS	6H DT.	6I MU	7A GM..	7B ELA.

The grey cells (2nd component) are in parallel in 6th and 7th form. The pink cells (4th component) are also in parallel. Everything is nicely organised as requested. I have of course no objection to this data set, but I will stress that such organisation may be the start of a very slippery road where you could easily go astray.

6.4.3 Teacher Pools

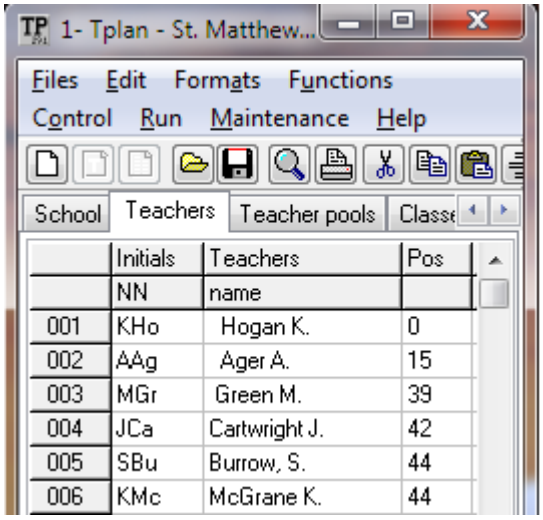
I have never officially documented this facility which I absolutely see could be a very useful tool in various contexts. The mechanism has not been my main concern while developing drag/drop in

version 29.1. However, I would like to sum up the current situation and while developing the P4-operator I realise that we could give Teacher Pools extended use by including these in sensible selections even if the school is not using pool teachers at all in their subject register. A Teacher Pool Register might look like this:



A Teacher Pool is defind be 3 characters and the first one MUST be: #. Then follows the initials of the teachers included in various pools. These pool identifiers MUST ALSO be entered in Teacher register and Room register. The general idea is to require a pool identifier as teacher in subject register. This is more or less treated as a room group, and when you eventually do the room allocation you select the actual teacher for the various subjects. This teacher allocation is subject to VERY STRICT RULES about using as few teachers as possible for the same subject.

There is more to Teacher Pools than that. The teacher register looks like this:



The interesting column here is now Pos (i.e.). **When using Teacher Pools this value states the MAXIMAL NO OF PERIODS a teacher may teach in ordinary teaching + periods being included in some pool. This limitation is quite obvious: Assume for instance that the headmaster or some part-timers with few periods are included in pools and without some limitation they are very tempting to use in Pool arrangements.**

The end result of using Teacher Pools might result in a table like this:

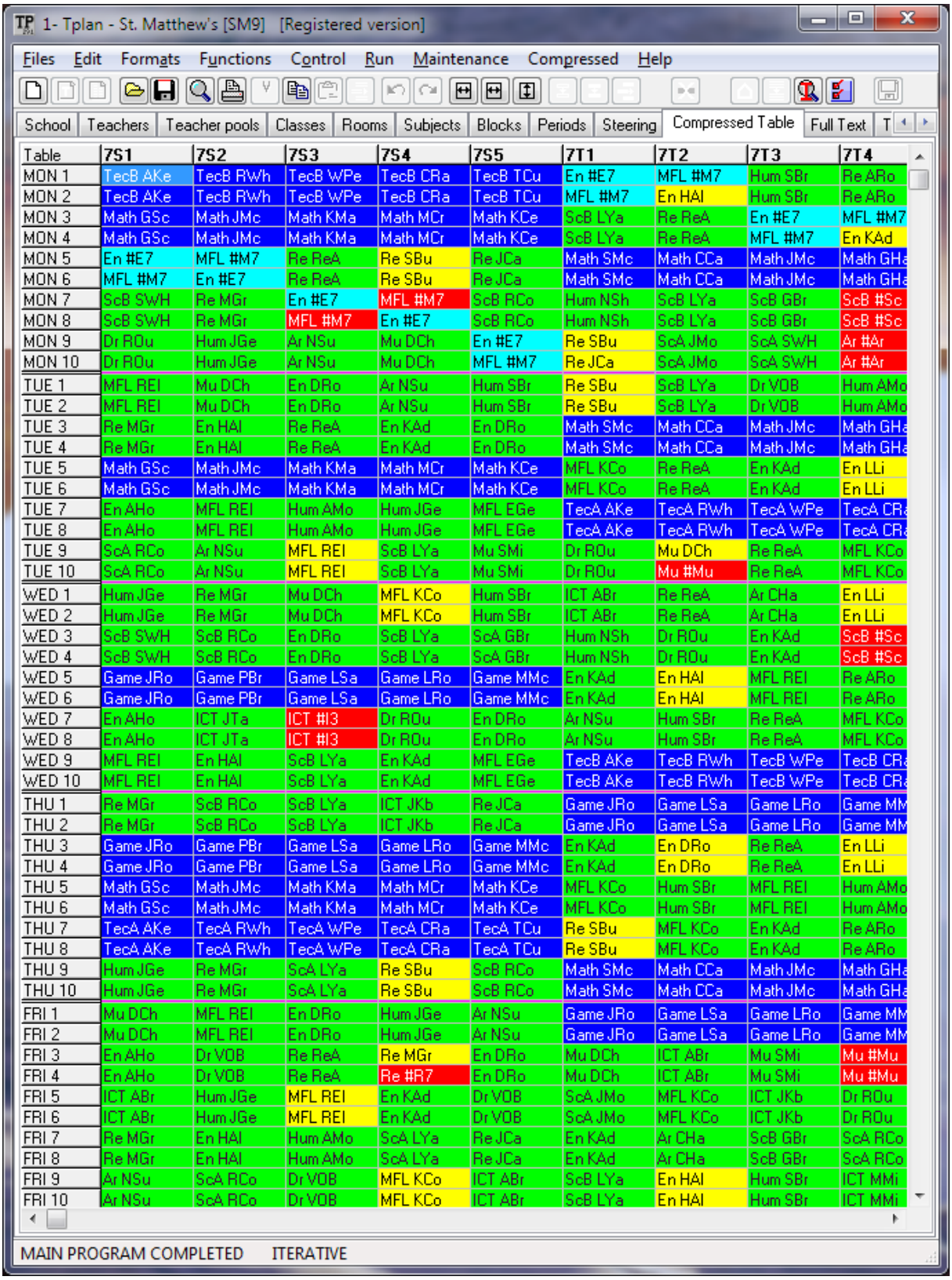


Table	7S1	7S2	7S3	7S4	7S5	7T1	7T2	7T3	7T4
MON 1	TecB AKe	TecB RWh	TecB WPe	TecB CRa	TecB TCu	En #E7	MFL #M7	Hum SBr	Re ARo
MON 2	TecB AKe	TecB RWh	TecB WPe	TecB CRa	TecB TCu	MFL #M7	En HAl	Hum SBr	Re ARo
MON 3	Math GSc	Math JMc	Math KMa	Math MCr	Math KCe	ScB LYa	Re ReA	En #E7	MFL #M7
MON 4	Math GSc	Math JMc	Math KMa	Math MCr	Math KCe	ScB LYa	Re ReA	MFL #M7	En KAd
MON 5	En #E7	MFL #M7	Re ReA	Re SBu	Re JCa	Math SMc	Math CCa	Math JMc	Math GHa
MON 6	MFL #M7	En #E7	Re ReA	Re SBu	Re JCa	Math SMc	Math CCa	Math JMc	Math GHa
MON 7	ScB SWH	Re MGr	En #E7	MFL #M7	ScB RCo	Hum NSh	ScB LYa	ScB GBr	ScB #Sc
MON 8	ScB SWH	Re MGr	MFL #M7	En #E7	ScB RCo	Hum NSh	ScB LYa	ScB GBr	ScB #Sc
MON 9	Dr ROu	Hum JGe	Ar NSu	Mu DCh	En #E7	Re SBu	ScA JMo	ScA SWH	Ar #Ar
MON 10	Dr ROu	Hum JGe	Ar NSu	Mu DCh	MFL #M7	Re JCa	ScA JMo	ScA SWH	Ar #Ar
TUE 1	MFL REI	Mu DCh	En DRo	Ar NSu	Hum SBr	Re SBu	ScB LYa	Dr VOB	Hum AMo
TUE 2	MFL REI	Mu DCh	En DRo	Ar NSu	Hum SBr	Re SBu	ScB LYa	Dr VOB	Hum AMo
TUE 3	Re MGr	En HAl	Re ReA	En KAd	En DRo	Math SMc	Math CCa	Math JMc	Math GHa
TUE 4	Re MGr	En HAl	Re ReA	En KAd	En DRo	Math SMc	Math CCa	Math JMc	Math GHa
TUE 5	Math GSc	Math JMc	Math KMa	Math MCr	Math KCe	MFL KCo	Re ReA	En KAd	En LLi
TUE 6	Math GSc	Math JMc	Math KMa	Math MCr	Math KCe	MFL KCo	Re ReA	En KAd	En LLi
TUE 7	En AHo	MFL REI	Hum AMo	Hum JGe	MFL EGe	TecA AKe	TecA RWh	TecA WPe	TecA CRa
TUE 8	En AHo	MFL REI	Hum AMo	Hum JGe	MFL EGe	TecA AKe	TecA RWh	TecA WPe	TecA CRa
TUE 9	ScA RCo	Ar NSu	MFL REI	ScB LYa	Mu SMi	Dr ROu	Mu DCh	Re ReA	MFL KCo
TUE 10	ScA RCo	Ar NSu	MFL REI	ScB LYa	Mu SMi	Dr ROu	Mu #Mu	Re ReA	MFL KCo
WED 1	Hum JGe	Re MGr	Mu DCh	MFL KCo	Hum SBr	ICT ABr	Re ReA	Ar CHa	En LLi
WED 2	Hum JGe	Re MGr	Mu DCh	MFL KCo	Hum SBr	ICT ABr	Re ReA	Ar CHa	En LLi
WED 3	ScB SWH	ScB RCo	En DRo	ScB LYa	ScA GBr	Hum NSh	Dr ROu	En KAd	ScB #Sc
WED 4	ScB SWH	ScB RCo	En DRo	ScB LYa	ScA GBr	Hum NSh	Dr ROu	En KAd	ScB #Sc
WED 5	Game JRo	Game PBr	Game LSa	Game LRo	Game MMc	En KAd	En HAl	MFL REI	Re ARo
WED 6	Game JRo	Game PBr	Game LSa	Game LRo	Game MMc	En KAd	En HAl	MFL REI	Re ARo
WED 7	En AHo	ICT JTa	ICT #I3	Dr ROu	En DRo	Ar NSu	Hum SBr	Re ReA	MFL KCo
WED 8	En AHo	ICT JTa	ICT #I3	Dr ROu	En DRo	Ar NSu	Hum SBr	Re ReA	MFL KCo
WED 9	MFL REI	En HAl	ScB LYa	En KAd	MFL EGe	TecB AKe	TecB RWh	TecB WPe	TecB CRa
WED 10	MFL REI	En HAl	ScB LYa	En KAd	MFL EGe	TecB AKe	TecB RWh	TecB WPe	TecB CRa
THU 1	Re MGr	ScB RCo	ScB LYa	ICT JKb	Re JCa	Game JRo	Game LSa	Game LRo	Game MM
THU 2	Re MGr	ScB RCo	ScB LYa	ICT JKb	Re JCa	Game JRo	Game LSa	Game LRo	Game MM
THU 3	Game JRo	Game PBr	Game LSa	Game LRo	Game MMc	En KAd	En DRo	Re ReA	En LLi
THU 4	Game JRo	Game PBr	Game LSa	Game LRo	Game MMc	En KAd	En DRo	Re ReA	En LLi
THU 5	Math GSc	Math JMc	Math KMa	Math MCr	Math KCe	MFL KCo	Hum SBr	MFL REI	Hum AMo
THU 6	Math GSc	Math JMc	Math KMa	Math MCr	Math KCe	MFL KCo	Hum SBr	MFL REI	Hum AMo
THU 7	TecA AKe	TecA RWh	TecA WPe	TecA CRa	TecA TCu	Re SBu	MFL KCo	En KAd	Re ARo
THU 8	TecA AKe	TecA RWh	TecA WPe	TecA CRa	TecA TCu	Re SBu	MFL KCo	En KAd	Re ARo
THU 9	Hum JGe	Re MGr	ScA LYa	Re SBu	ScB RCo	Math SMc	Math CCa	Math JMc	Math GHa
THU 10	Hum JGe	Re MGr	ScA LYa	Re SBu	ScB RCo	Math SMc	Math CCa	Math JMc	Math GHa
FRI 1	Mu DCh	MFL REI	En DRo	Hum JGe	Ar NSu	Game JRo	Game LSa	Game LRo	Game MM
FRI 2	Mu DCh	MFL REI	En DRo	Hum JGe	Ar NSu	Game JRo	Game LSa	Game LRo	Game MM
FRI 3	En AHo	Dr VOB	Re ReA	Re MGr	En DRo	Mu DCh	ICT ABr	Mu SMi	Mu #Mu
FRI 4	En AHo	Dr VOB	Re ReA	Re #R7	En DRo	Mu DCh	ICT ABr	Mu SMi	Mu #Mu
FRI 5	ICT ABr	Hum JGe	MFL REI	En KAd	Dr VOB	ScA JMo	MFL KCo	ICT JKb	Dr ROu
FRI 6	ICT ABr	Hum JGe	MFL REI	En KAd	Dr VOB	ScA JMo	MFL KCo	ICT JKb	Dr ROu
FRI 7	Re MGr	En HAl	Hum AMo	ScA LYa	Re JCa	En KAd	Ar CHa	ScB GBr	ScA RCo
FRI 8	Re MGr	En HAl	Hum AMo	ScA LYa	Re JCa	En KAd	Ar CHa	ScB GBr	ScA RCo
FRI 9	Ar NSu	ScA RCo	Dr VOB	MFL KCo	ICT ABr	ScB LYa	En HAl	Hum SBr	ICT MMi
FRI 10	Ar NSu	ScA RCo	Dr VOB	MFL KCo	ICT ABr	ScB LYa	En HAl	Hum SBr	ICT MMi

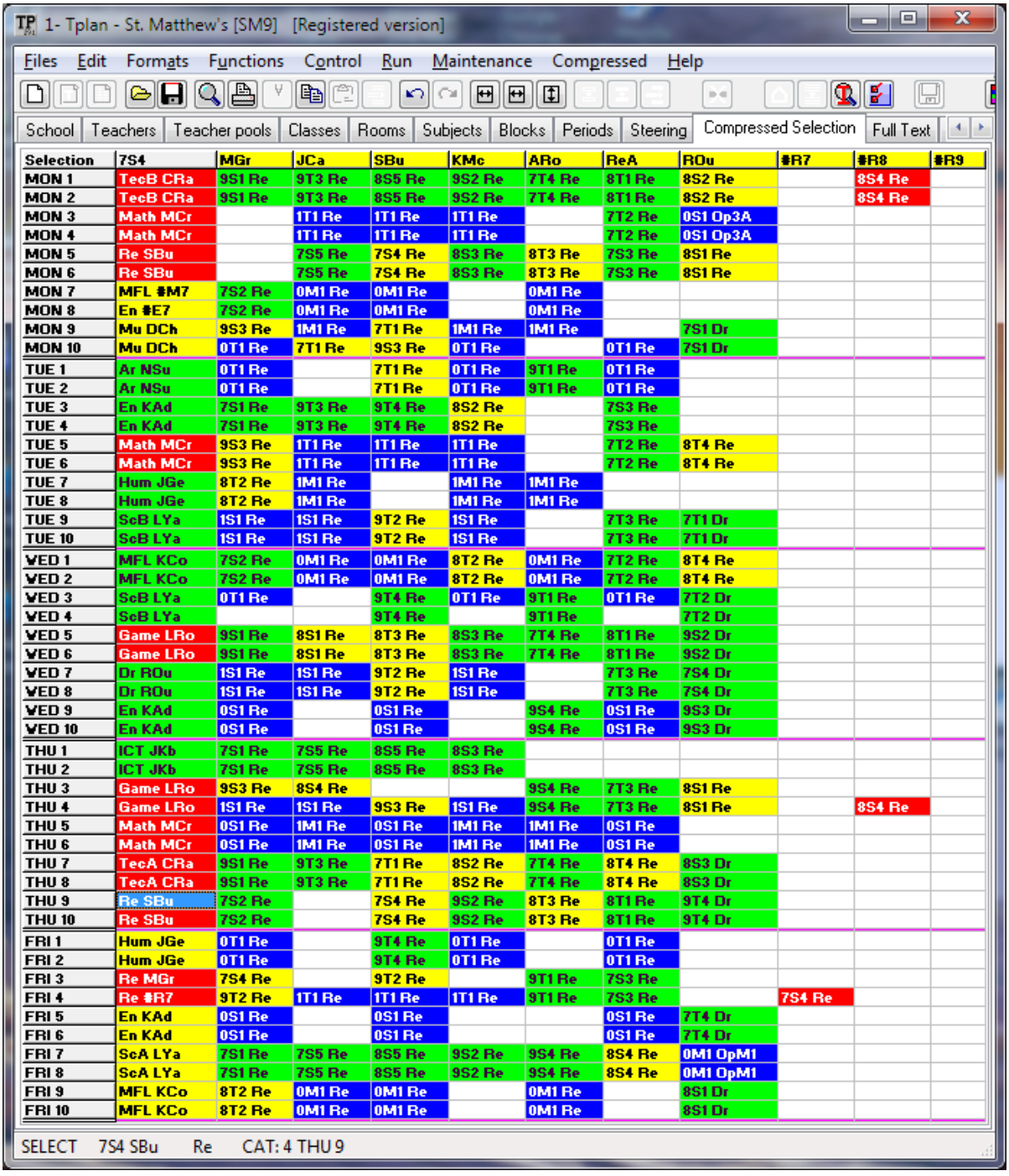
In this case year 7 is the lowest form in this school and Teacher Pools are used to an extreme extent here. The green, yellow and red colours shall be interpreted this way:

Green: This subject has same teacher in all periods.

Yellow: Subject is lectured by two (or more) teachers.

Red: This period is currently lacking a teacher

We can continue with this table a little. We notice that 7S4 in lacking teacher in RE in FRI 4. We select this period **and also all pools able to teach RE.** We get this selection:



Selection	7S4	MGr	JCa	SBu	KMc	ARo	ReA	ROu	#R7	#R8	#R9
MON 1	TecB CRa	9S1 Re	9T3 Re	8S5 Re	9S2 Re	7T4 Re	8T1 Re	8S2 Re		8S4 Re	
MON 2	TecB CRa	9S1 Re	9T3 Re	8S5 Re	9S2 Re	7T4 Re	8T1 Re	8S2 Re		8S4 Re	
MON 3	Math MCr		1T1 Re	1T1 Re	1T1 Re		7T2 Re	0S1 Op3A			
MON 4	Math MCr		1T1 Re	1T1 Re	1T1 Re		7T2 Re	0S1 Op3A			
MON 5	Re SBu		7S5 Re	7S4 Re	8S3 Re	8T3 Re	7S3 Re	8S1 Re			
MON 6	Re SBu		7S5 Re	7S4 Re	8S3 Re	8T3 Re	7S3 Re	8S1 Re			
MON 7	MFL #M7	7S2 Re	0M1 Re	0M1 Re		0M1 Re					
MON 8	En #E7	7S2 Re	0M1 Re	0M1 Re		0M1 Re					
MON 9	Mu DCh	9S3 Re	1M1 Re	7T1 Re	1M1 Re	1M1 Re		7S1 Dr			
MON 10	Mu DCh	0T1 Re	7T1 Re	9S3 Re	0T1 Re		0T1 Re	7S1 Dr			
TUE 1	Ar NSu	0T1 Re		7T1 Re	0T1 Re	9T1 Re	0T1 Re				
TUE 2	Ar NSu	0T1 Re		7T1 Re	0T1 Re	9T1 Re	0T1 Re				
TUE 3	En KAd	7S1 Re	9T3 Re	9T4 Re	8S2 Re		7S3 Re				
TUE 4	En KAd	7S1 Re	9T3 Re	9T4 Re	8S2 Re		7S3 Re				
TUE 5	Math MCr	9S3 Re	1T1 Re	1T1 Re	1T1 Re		7T2 Re	8T4 Re			
TUE 6	Math MCr	9S3 Re	1T1 Re	1T1 Re	1T1 Re		7T2 Re	8T4 Re			
TUE 7	Hum JGe	8T2 Re	1M1 Re		1M1 Re	1M1 Re					
TUE 8	Hum JGe	8T2 Re	1M1 Re		1M1 Re	1M1 Re					
TUE 9	ScB LYa	1S1 Re	1S1 Re	9T2 Re	1S1 Re		7T3 Re	7T1 Dr			
TUE 10	ScB LYa	1S1 Re	1S1 Re	9T2 Re	1S1 Re		7T3 Re	7T1 Dr			
WED 1	MFL KCo	7S2 Re	0M1 Re	0M1 Re	8T2 Re	0M1 Re	7T2 Re	8T4 Re			
WED 2	MFL KCo	7S2 Re	0M1 Re	0M1 Re	8T2 Re	0M1 Re	7T2 Re	8T4 Re			
WED 3	ScB LYa	0T1 Re		9T4 Re	0T1 Re	9T1 Re	0T1 Re	7T2 Dr			
WED 4	ScB LYa			9T4 Re		9T1 Re		7T2 Dr			
WED 5	Game LRo	9S1 Re	8S1 Re	8T3 Re	8S3 Re	7T4 Re	8T1 Re	9S2 Dr			
WED 6	Game LRo	9S1 Re	8S1 Re	8T3 Re	8S3 Re	7T4 Re	8T1 Re	9S2 Dr			
WED 7	Dr ROu	1S1 Re	1S1 Re	9T2 Re	1S1 Re		7T3 Re	7S4 Dr			
WED 8	Dr ROu	1S1 Re	1S1 Re	9T2 Re	1S1 Re		7T3 Re	7S4 Dr			
WED 9	En KAd	0S1 Re		0S1 Re		9S4 Re	0S1 Re	9S3 Dr			
WED 10	En KAd	0S1 Re		0S1 Re		9S4 Re	0S1 Re	9S3 Dr			
THU 1	ICT JKb	7S1 Re	7S5 Re	8S5 Re	8S3 Re						
THU 2	ICT JKb	7S1 Re	7S5 Re	8S5 Re	8S3 Re						
THU 3	Game LRo	9S3 Re	8S4 Re			9S4 Re	7T3 Re	8S1 Re			
THU 4	Game LRo	1S1 Re	1S1 Re	9S3 Re	1S1 Re	9S4 Re	7T3 Re	8S1 Re		8S4 Re	
THU 5	Math MCr	0S1 Re	1M1 Re	0S1 Re	1M1 Re	1M1 Re	0S1 Re				
THU 6	Math MCr	0S1 Re	1M1 Re	0S1 Re	1M1 Re	1M1 Re	0S1 Re				
THU 7	TecA CRa	9S1 Re	9T3 Re	7T1 Re	8S2 Re	7T4 Re	8T4 Re	8S3 Dr			
THU 8	TecA CRa	9S1 Re	9T3 Re	7T1 Re	8S2 Re	7T4 Re	8T4 Re	8S3 Dr			
THU 9	Re SBu	7S2 Re		7S4 Re	9S2 Re	8T3 Re	8T1 Re	9T4 Dr			
THU 10	Re SBu	7S2 Re		7S4 Re	9S2 Re	8T3 Re	8T1 Re	9T4 Dr			
FRI 1	Hum JGe	0T1 Re		9T4 Re	0T1 Re		0T1 Re				
FRI 2	Hum JGe	0T1 Re		9T4 Re	0T1 Re		0T1 Re				
FRI 3	Re MGr	7S4 Re		9T2 Re		9T1 Re	7S3 Re				
FRI 4	Re #R7	9T2 Re	1T1 Re	1T1 Re	1T1 Re	9T1 Re	7S3 Re		7S4 Re		
FRI 5	En KAd	0S1 Re		0S1 Re			0S1 Re	7T4 Dr			
FRI 6	En KAd	0S1 Re		0S1 Re			0S1 Re	7T4 Dr			
FRI 7	ScA LYa	7S1 Re	7S5 Re	8S5 Re	9S2 Re	9S4 Re	8S4 Re	0M1 OpM1			
FRI 8	ScA LYa	7S1 Re	7S5 Re	8S5 Re	9S2 Re	9S4 Re	8S4 Re	0M1 OpM1			
FRI 9	MFL KCo	8T2 Re	0M1 Re	0M1 Re		0M1 Re		8S1 Dr			
FRI 10	MFL KCo	8T2 Re	0M1 Re	0M1 Re		0M1 Re		8S1 Dr			

We get the class 7S4, all teachers being able to teach RE and to the right we see all requirements to pools teaching RE and still not being assigned to some real teacher. We can easily solve FRI 4 by using teacher Rou and just drag 7S4 to Rou. The remainder is not solved by this figure and I skip continued work.

However, there is a further important point with the above figure: Even if you are not using teacher pools at all you may be well served by creating selections like the one above to create survey of possible teachers in case you must do some teacher changes.

As mentioned Teacher Pools has not been the focus of my interest while developing drag/drop. My current attitude to Teacher Pools is as follows:

- I am a firm believer in the value of using Teacher Pools in some contexts. Currently the most typical case is as follows: In a UK school you have complex upper forms with components and many large blocks and several compromises must eventually be done. In the lower forms there is a lot of freedom for deciding the teacher work load and there are also a lot of pure class acts. Considerable freedom for the upper forms may be achieved by using Pool Teachers in lower forms; in particular in subjects with few periods. (For the moment I am very sceptical to Pools in subjects with many periods, but that might improve in the future.)

- MY MAIN CONCERN FOR MORE THAN 3 YEARS HAS BEEN REORGANSATION OF INTERNAL DATA STRUCTURE AND DRAG/DROP TECHCIQUES WHILE TEACHER POOLS HAS DEFINITELY BEEN IGNORED. I DEFINITELY SEE THAT THE NEW DATA STRUCTURE WILL HAVE CONSIDERABLE POSITIVE EFFECTS ON THE TEACHER POOL – MECHANISM. TIME HAS NOT PERMITTED ME TO EXPLOIT THAT; JUST NOW I AM AFRAID THAT THERE MIGHT BE LOUSY BUGS. HOPEFULLY I MIGHT BE ALLOWED TO CHECK THAT IN THE NEXT FEW WEEKS (MONTHS).

May 29, 2011
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