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# TecNote 3010 - NTCIP Database Guidelines Part I

The NTCIP specification defines "objects" which indirectly define the controller database as well as the communications protocol. Naztec has fully embraced NTCIP and the databases for the Naztec TS-2, 2070 and 170E controllers provide a one-to-one (or byte-to-byte) match with the object definitions in the NTCIP standard. Thanks to NTCIP, the controller database now has a level of uniformity that TS-1 could not provide. Because Naztec will fully support the NTCIP objects and all Naztec MIB's in existing and future controller lines, there will eventually not be a need for this conversion process as our existing customers base upgrades to NTCIP.

Naztec, Inc. currently supports 22 TS-1 controller types developed for different agencies over the last 21 years. Several customers are in the process of converting TS-1 controller databases to NTCIP by upgrading the front-panel of the controller. These TS-1 controller databases do not provide a one-to-one match with the NTCIP objects, so most of the database must be converted manually. This TecNote provides guidelines to make the conversion as painless as possible using StreetWise utilities to aid in the process.

This TecNote serves only as a guideline for a TS-1 database conversion to NTCIP. Each user must adopt their own set of standards for a default "Data Template" for their system to maintain the accuracy of the TS-1 database and minimize the effort required to take advantage of the new features provided by NTCIP.

## Overview of The Conversion Process

Street-wise provides an *Import database* feature that allows you to import a controller database which has the same controller type. This *Import database* feature does not support conversions between different controller types, so you need to work through an intermediate or "Temporary" data file for this conversion.

In these examples, we will create controller ID 850 as a "Data template" to record the base data that you want to apply to each intersection in your system. We will then use StreetWise to import this "Data Template" to ID 851 as a temporary or "Temporary" data file. This will allow us to use StreetWise to call up your existing data files and copy-and-paste as much as possible to update the "NTCIP Temporary File". After the "Temporary" data file is updated, you can delete your existing data file and recreate it with the new controller type. Finally you can use the *Import database* feature in StreetWise to import the ID 851 "Temporary" database to the new controller. This process insures that the controller type definitions are maintained correctly in your StreetWise database.

After you have created the "Data Template" in Steps 1-4 below, you will perform these steps to systematically convert all of your existing TS-1 data files:

1. View the "Temporary" controller database (ID 851)
2. Import the "Data Template" from (ID 850) using the selection "*Import database*" from the Utilities menu under ID 851
3. View the controller database you want to convert (for this example, assume ID 1)
4. copy-and-Paste the screens from ID 1 to the "Temporary" database (discussed in Step 5 below)
5. Make final adjustments to the "Temporary" database in ID 851 (discussed in Step 6 below)
6. Delete ID 1, then recreate ID 1 with the new NTCIP controller type
7. Use the "*Import database*" feature for ID 1 to import the "Temporary database from ID 851

## Step 1 - Create a "Data Template" and a "Temporary Data" File

1. Create a new controller in StreetWise for ID 850 with the 980 TS-2 “Controller Type” (either 980 TS2 50.x NTCIP or 980 TS2 Secondary 50.x)
2. Give ID850 the name “850 NTCIP Data Template”2) Delete controller ID851 (unless this is an existing data set you want to convert)
3. Create a new controller in StreetWise for ID 851 with the 980 TS2 50.x NTCIP or 980 TS2 Secondary 50.x controller type
4. Give ID851 the name “NTCIP Temporary File”
5. Go ahead "View" controller ID 850 and ID 851 from the StreetWise client.

## Step 2 - Initialize a Controller to Build the Initial "Data Template"

This step initializes a standard 8-phase controller which contains much of the database you need for a "Data Template". Go ahead and initialize a TS-2, 2070 or 970 controller using the following keyboard sequences from the main menu

1. Make sure your controller is "flashed" with the current version you are moving to
2. MM->1->7 toggle the Run Timer OFF
3. MM->8->4->1 (Clear & Init All) and select a STD-8ø as the Operating Mode
4. MM->1->7 toggle the Run Timer ON
5. Change the controller ID to 850 and modify the Comm parameters (MM->6) to match the baud rate and duplex settings for the serial port in StreetWise
6. Upload the initialized controller to StreetWise.
7. Save your "Upload" file to the "Standard" and "Permanent" Files using the *Utilities* menu.

Now we will modify this base data to create the "Data Template" for every controller in your system.

## Step 3 - Build a "Data Template" Using The Controller Keypad

The "Data Template" you provide under Step 3 will be the starting point for every controller in your system. The following guidelines will help you select the common database information for the "Data Template". This method will save you a lot of work later on and insure that the base data for all of your controllers is the same.

You will build the "Data Template" using the controller keypad, rather than StreetWise to give you practice with the controller. At the end of Step 3, you will upload and save the controller database to the standard and permanent data files in StreetWise.

### Modify the Unit Parameters

The Unit Parameters can be accessed from the controller Main menu by using the key sequence MM->1->2->1. This Data Template provides a conservative *Start-Up Flash* time of 10 seconds which provides additional flash time after a power interruption.

The *Start Red Time* applies to any Startup phase you have programmed to RED CLR under screen MM->1->1->4. The default Start Red Time is 0", so if you want to start-up in a red clearance clearance on all phases, modify this value and change all startup values on screen MM->1->1->4 to RED CLR. This Data Template uses a 5" *Start Red Time* to provide time for a policeman directing traffic to clear the intersection before the controller returns to stop-and-go operation.

This Data Template sets *Disable Init Ped* to ON so no artificial pedestrian calls are placed on the controller during a start-up condition. However, the pedestrian phases are still serviced if a pedestrian actuation is called.

If you have a TS-2 (type-2) controller and redefine the I/O (Inputs/Outputs) of the A-B-C connectors, you may want to adjust the *IO Mode* setting under Unit Parameters (the default is Auto). You can also turn *Tone Disable* ON if you do not want to use the audible "beep" indication as a default.

Unit Parameters are typically constant for every controller in your system. Therefore, you should read chapter 4.8 of the TS-2 controller manual carefully and modify any unit defaults needed for your system.

## Define All Ring Sequences

TS-2 calls for 16 separate sequence definitions per controller. There are sixteen sequence combinations of leading and lagging left turns in a standard 8-phase dual-ring controller. Our standard data template will standardize these 16 phase sequence combinations. Now, take a look at the sequence table (MM->1->2-4)

Initializing the controller data base in Step 2 set up a dual ring 8-phase sequence in sequence number 1 in this sequence table. Our data template defines the remaining 15 sequences to standardize phase sequences for every controller in your system. The advantage of a standard phase sequence chart will become apparent when you begin implementing coordination patterns for the controller.

Go ahead and key in phase sequence # 2 - 16 using this chart.

| Sequence # | Left Barrier | Right Barrier | Controller Seq. |
|---|---|---|---|
| 1 | 1+5 lead | 3+7 lead | Ring1: 1 2 3 4<br>Ring2: 5 6 7 8 |
| 2 | 1 lead | 3+7 lead | Ring1: 1 2 3 4<br>Ring2: 6 5 7 8 |
| 3 | 5 lead | 3+7 lead | Ring1: 2 1 3 4<br>Ring2: 5 6 7 8 |
| 4 | 1+5 lag | 3+7 lead | Ring1: 2 1 3 4<br>Ring2: 6 5 7 8 |
| 5 | 1+5 lead | 3 lead | Ring1: 1 2 3 4<br>Ring2: 5 6 8 7 |
| 6 | 1 lead | 3 lead | Ring1: 1 2 3 4<br>Ring2: 6 5 8 7 |
| 7 | 5 lead | 3 lead | Ring1: 2 1 3 4<br>Ring2: 5 6 8 7 |
| 8 | 1+5 lag | 3 lead | Ring1: 2 1 3 4<br>Ring2: 6 5 8 7 |
| 9 | 1+5 lead | 7 lead | Ring1: 1 2 4 3<br>Ring2: 5 6 7 8 |
| 10 | 1 lead | 7 lead | Ring1: 1 2 4 3<br>Ring2: 6 5 7 8 |
| 11 | 5 lead | 7 lead | Ring1: 2 1 4 3<br>Ring2: 5 6 7 8 |
| 12 | 1+5 lag | 7 lead | Ring1: 2 1 4 3<br>Ring2: 6 5 7 8 |
| 13 | 1+5 lead | 3+7 lag | Ring1: 1 2 4 3<br>Ring2: 5 6 8 7 |
| 14 | 1 lead | 3+7 lag | Ring1: 1 2 4 3<br>Ring2: 6 5 8 7 |
| 15 | 5 lead | 3+7 lag | Ring1: 2 1 4 3<br>Ring2: 5 6 8 7 |
| 16 | 1+5 lag | 3+7 lag | Ring1: 2 1 4 3<br>Ring2: 6 5 8 7 |

Warning!!!: DO NOT use lagging left-turn sequence in the above table if a left-turn signal display contains protected and permitted indications in the same display unless you follow all of the guidelines in TecNote 1103 - The Permitted Lag Left-Turn Display or some other method approved by your Agency. Naztec, Inc. assumes no liability for the "Yellow Trap" safety problem discussed in these TecNotes.

## Default Channel Assignments for 8 Phase - Dual Ring Operation

NTCIP and TS-2 refer to a load switche as a "channel". The controller software allows you to drive a load switch with any vehicle, ped or phase output. When you initialized the controller in Step 2 above, the following default channel assignments were programmed into screen MM->1->3->1.

```
    Chan..1.....2....3....4....5....6....7.....8 ->
 ø/Olp#   1     2    3.   4    5    6    7     8
 Type    VEH   VEH  VEH .VEH  VEH  VEH  VEH   VEH
Flash    RED   RED  RED .RED  RED  RED  RED   RED
```

Note that the Flash settings are all set to RED. This cause the intersection to go to an all-way red flash when the flash switch is activated in the cabinet door (automatic flash) as explained in our next section. We have intentionally set all channels to RED flash in the Data Template as a safe default. You may want to program the main street phases to flash amber (YEL) if you plan to run automatic flash by time-of-day.

## Define the Parameters for Automatic Flash

You can change the Auto Flash Parameters under screen MM->1->4->1.

This Data Template sets the Flash Mode to CHANNEL which directs the controller to flash the load switches through the channel assignments given in the last section.

The "Input Src" for Type-2 cabinets can be changed to D-CONN if the cabinet flash switch is wired through the D-connector (Texas method) or to TEST-A or TEST-B if wired through the NEMA TS-1 test inputs (State of Florida method).

The yellow and all-red clearance times can also be modified for the Data Template under this screen. If any channel is set to flash yellow, these are the clearance times that are timed before the controller goes back to normal stop-and-go operation.

```
Auto Flash Parameters        - Clrnc Time -
   flash Mode:CHANNEL          Yellow  3.5
  Input Src,  Type 2:D-CONN    Red     1.5
```

## Default Concurrent Phases for 8 Phase Dual-Ring Operation

Concurrent phases (also known as compatible phases) determine which phases can be serviced at the same time in separate rings. Concurrent phases combine with the sequence definitions to create the barrier structure for the 8 phase dual ring controller.

The following concurrent phases were defined when you initialized the controller under Step 2 (MM->1->1->4).

| P | Ring | StartUp | Concurrent Ps | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 1 | 1 | RED CLR | 5 | 6 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2 | 1 | RED CLR | 5 | 6 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3 | 1 | RED CLR | 7 | 8 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4 | 1 | RED CLR | 7 | 8 | 0 | 0 | 0 | 0 | 0 | 0 |
| 5 | 2 | RED CLR | 1 | 2 | 0 | 0 | 0 | 0 | 0 | 0 |
| 6 | 2 | RED CLR | 1 | 2 | 0 | 0 | 0 | 0 | 0 | 0 |
| 7 | 2 | RED CLR | 3 | 4 | 0 | 0 | 0 | 0 | 0 | 0 |
| 8 | 2 | RED CLR | 3 | 4 | 0 | 0 | 0 | 0 | 0 | 0 |
| 9 | 0 | RED CLR | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 10 | 0 | RED CLR | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 11 | 0 | RED CLR | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 12 | 0 | RED CLR | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 13 | 0 | RED CLR | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 14 | 0 | RED CLR | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 15 | 0 | RED CLR | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 16 | 0 | RED CLR | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

The StartUp values in this Data Template have been changed from RED to RED CLR to utilize the *Start Red Time* unit parameter (MM->1->2->1->pagedown) rather than the all-red times programmed for each phase. After powered up, the controller times a 5" *StartUp Flash* followed by a 10" *Start Red Time*. This was discussed above under the Unit Parameters section.

Note that only 8 phases are defined and that phases 9 through 16 have a zero programmed in the ring column. If more than 8 phases or 2 rings are needed, the unit parameter, *Phase Mode* must be changed from STD8 to USER under screen MM->1->2->1->pagedown. The Data Template developed in this TecNote uses the standard 8-phase defaults when the controller was initialized under Step 2.

## Modify the Detection Parameters

Cabinet detection can be classified into one of the following groups:

1. TS-1 Cabinet Detection - Multiple detector outputs are combined to a single vehicle input for phases 1 throu 8 using the TS-1 cabinet wiring. This type of detection does not provide individual lane counts because detector outputs from adjacent lanes are physically wired to the same controller input.

2. TS-2 Cabinet Detection - Each detector output is brought into the controller over a separate input pin (TS-2 Type 2) or via the SDLC port (TS-2 Type 1). Either method provides accurate volume and occupancy for each detector which is sampled separately and mapped to the controller phase(s) through software.

### Detector Vehicle Parameters

Most agencies adopt a standard numbering scheme for numbering local intersection detectors. This Data Template assumes that a TS-1 Cabinet is used and that all cabinet detection is wired to vehicle inputs 1 through 8. This is the default when you initialize the Naztec controller database.

This Data Template assumes that detectors 1 - 8 and 9 - 16 call and extend vehicle phases 1 - 8. You may also want to standardize the delay and extend settings for each detector in your Data Template.

Access detector vehicle parameters from the Main Menu using keystrokes MM->5->1.

| Det# | Call | Switch | Delay | Extend | Queue | -> |
|---|---|---|---|---|---|---|
| 1 | 1 | 0 | 0.0 | 0.0 | 0 | |
| 2 | 2 | 0 | 0.0 | 0.0 | 0 | |
| 3 | 3 | 0 | 0.0 | 0.0 | 0 | |
| 4 | 4 | 0 | 0.0 | 0.0 | 0 | |
| 5 | 5 | 0 | 0.0 | 0.0 | 0 | |
| 6 | 6 | 0 | 0.0 | 0.0 | 0 | |
| 7 | 7 | 0 | 0.0 | 0.0 | 0 | |
| 8 | 8 | 0 | 0.0 | 0.0 | 0 | |
| 9 | 1 | 0 | 0.0 | 0.0 | 0 | |
| 10 | 2 | 0 | 0.0 | 0.0 | 0 | |
| 11 | 3 | 0 | 0.0 | 0.0 | 0 | |
| 12 | 4 | 0 | 0.0 | 0.0 | 0 | |
| 13 | 5 | 0 | 0.0 | 0.0 | 0 | |
| 14 | 6 | 0 | 0.0 | 0.0 | 0 | |
| 15 | 7 | 0 | 0.0 | 0.0 | 0 | |
| 16 | 8 | 0 | 0.0 | 0.0 | 0 | |

We also recommend that you modify "Veh Options" under menu MM->5->2 to turn on CALL and EXEND for all 64 detectors in your Data Template. If some of your standard detectors use CALL but not EXTEND or EXTEND but not CALL functions, you will need to modify these for each controller database.

## Standardize the Default Events and Alarms

Controller alarms and events are specified under MM->1->6. Events are stored in the controller until they are uploaded by StreetWise. Alarms are events that are uploaded when the system (or closed-loop master) requests local alarms. Events and alarms are provided in the following table:

| Event/ Alarm # | Function |
|---|---|
| 1 | Power Up |
| 2 | Stop Timing - Manual Control Enable |
| 3 | Cabinet Door Open |
| 4 | Coordination Failure |
| 5 | External Alarm #1 |
| 6 | External Alarm #2 |
| 7 | External Alarm #3 |
| 8 | External Alarm #4 |
| 9 | Closed Loop Disabled |
| 10 | External Alarm #5 |
| 33 | Street Lamp Failure |
| 34 | Signal Lamp Failure |
| 35 | External Alarm #6 |
| 37 | Request Database Download |
| 49 | Controller Fault |
| 50 | Local Flash |
| 51 | MMU Flash |

Set the following Events in your Data Template under screen MM->1->6->1:

```
Event Enable    Column . 1 . 2 . 3 . 4 . 5 . 6 . 7 . 8
   Event #s  1-8         X   X   X   X   X   X   X   X
             9-16        .   X   .   .   .   .   .   .
            17-24        .   .   .   .   .   .   .   .
            25-32        .   .   .   .   .   .   .   .
            33-40        .   .   X   .   .   .   .   .
            41-48        .   .   .   .   .   .   .   .
            49-56        X   X   .   .   .   .   .   .
            57-64        .   .   .   .   .   .   .   .
            65-72        .   .   .   .   .   .   .   .
....
           121-128       .   .   .   .   .   .   .   .
```

Set the following Alarms in your Data Template under screen MM->1->6->4:

```
Alarm Enable    Column . 1 . 2 . 3 . 4 . 5 . 6 . 7 . 8
     Alarm #s  1-8       X   X   X   X   X   X   X   X
              9-16       .   X   .   .   .   .   .   .
             17-24       .   .   .   .   .   .   .   .
             25-32       .   .   .   .   .   .   .   .
             33-40       .   .   X   .   .   .   .   .
             41-48       .   .   .   .   .   .   .   .
             49-56       X   X   .   .   .   .   .   .
             57-64       .   .   .   .   .   .   .   .
             65-72       .   .   .   .   .   .   .   .
....
            121-128      .   .   .   .   .   .   .   .
```

## Standardize the Coordination Mode+ Settings

The following coordination settings reflect the recommendations made in TecNote 1101 - NTCIP Coordination By Example. The coordination mode settings (MM->2->1) are provided on three separate controller screens (below). The "adjacent" screens are accessed using the arrow keys to toggle or "window" between screens. The values shown as "XXXX" are not needed (any setting will suffice). For more information on these settings, consult the controller manual or visit here.

```
       Coordination Modes          <-          Coordination Modes+
->

TestOpMode 0 Force-Off FIXED       Force-Off+ XXXX   Easy Float  XXXX

Correction SHORT/LONG              Closed Loop OFF   Auto Err Reset ON

Maximum MAX_INH                    External OFF

                                                  -- Leave Walk --

                                   Stop-in-Walk ON        Before TIMED

                                   Walk Recycle NO_RECYCLE After TIMED
```

Now, go to MM->2->5 and enter the following data for patterns 1 through 48:

```
 Pat#   Trans:  Short  Long  Dwell  No.Short. ø ->
   1             12     22    60     0  0  0  0
   2             12     22    60     0  0  0  0
   3             12     22    60     0  0  0  0
...
  48             12     22    60     0  0  0  0
```

From the current screen (MM->2->5), use your right arrow key to toggle to the right screen and enter the following data for patterns 1 through 48::

```
 <-Pat#  Coor.P: EarlyYld  Offset   RetHold
     1               0     EndGRN      X
     2               0     EndGRN      X
     3               0     EndGRN      X
.....
    48               0     EndGRN      X
```

## Standardize the Default Pattern Table

The default Pattern Table under controller screen MM->2->4 should be modified as follows so that the pattern number (Pat#) and the default split number is the same for patterns 1 through 24.

Pattern 48 is reserved for free operation as explained later in this TecNote. Selecting Pattern 48 will run the controller in free with the phase sequence selected for this pattern. This allows you to specify the phase sequence of the controller when running free operation.

| Pat# | Cycle | Offset | Split | Seqnc |
|---|---|---|---|---|
| 1 | 0 | 0 | 1 | 1 |
| 2 | 0 | 0 | 2 | 1 |
| 3 | 0 | 0 | 3 | 1 |
| 4 | 0 | 0 | 4 | 1 |
| 5 | 0 | 0 | 5 | 1 |
| 6 | 0 | 0 | 6 | 1 |
| 7 | 0 | 0 | 7 | 1 |
| 8 | 0 | 0 | 8 | 1 |
| 9 | 0 | 0 | 9 | 1 |
| 10 | 0 | 0 | 10 | 1 |
| 11 | 0 | 0 | 11 | 1 |
| 12 | 0 | 0 | 12 | 1 |
| ... | | | | |
| 24 | 0 | 0 | 24 | 1 |
| 25 | 0 | 0 | 0 | 1 |
| ... | | | | |
| 48 | 0 | 0 | 0 | 1 |

## Standardize the Transition Values for Each Pattern

Now, go to MM->2->5 and enter the following short-way, long-way and dwell transition values.

| Pat# | Trans: | Short | Long | Dwell | No. | Short. | ø | -> |
|---|---|---|---|---|---|---|---|---|
| 1 | | 12 | 22 | 60 | 0 | 0 | 0 | 0 |
| 2 | | 12 | 22 | 60 | 0 | 0 | 0 | 0 |
| 3 | | 12 | 22 | 60 | 0 | 0 | 0 | 0 |
| 4 | | 12 | 22 | 60 | 0 | 0 | 0 | 0 |
| 5 | | 12 | 22 | 60 | 0 | 0 | 0 | 0 |
| 6 | | 12 | 22 | 60 | 0 | 0 | 0 | 0 |
| 7 | | 12 | 22 | 60 | 0 | 0 | 0 | 0 |
| 8 | | 12 | 22 | 60 | 0 | 0 | 0 | 0 |
| 9 | | 12 | 22 | 60 | 0 | 0 | 0 | 0 |
| 10 | | 12 | 22 | 60 | 0 | 0 | 0 | 0 |
| .... | | | | | | | | |
| 48 | | 12 | 22 | 60 | 0 | 0 | 0 | 0 |

## Standardize The Action Table

The time-of-day scheduler is greatly simplified if you code the Pattern Number equal to the Action Number under screen MM->4->5. The following values are the defaults for this Data Template

```
Actn  Pattrn  Aux-123 Spec-12345678
  1      1        ...      ........
  2      2        ...      ........
  3      3        ...      ........
  4      4        ...      ........
  5      5        ...      ........
  6      6        ...      ........
....

  24    24        ...      ........
  25   255        ...      ........
....

  48     0        ...      ........
....

 100     0        ...      ........
```

Notice that the time-of-day scheduler assigns the Pattern Number equal to the Action Number for plans 1 - 24. The default Split Number assigned to the Pattern Table (MM->2->4) is also the same as the Pattern Number for patterns 1 - 24. (The first 24 actions and patterns are standard in the Data Template because there are a maximum of 24 splits per controller).

Also note that action 25 has been programmed with Pattern 255 which NTCIP defines as automatic flash. Action 25 can be used to cause the controller to go to automatic flash by time-of-day.

## Standard Timing Plans Used in This Data Template

Your database will be easier to maintain if you maintain this one-to-one relationship between action, pattern and split numbers for patterns 1 - 24. You will also find it easier to maintain your patterns if you develop a standard such as the one below as you develop your timing patterns:

| Timing Plan | Action Event |
|---|---|
| AM Patterns | 1 - 3 |
| AM Test Pattern | 4 |
| PM Patterns | 5 - 8 |
| PM Test Pattern | 9 |
| OFF Peak Patterns | 10 - 13 |
| OFF Peak Test Pattern | 14 |
| Weekend Patterns | 15 - 19 |
| Manual Control Plan | 20 |
| AM Incident | 21 |
| PM Incident | 22 |
| Off Peak Incident | 23 |
| (reserved) | 24 |
| Flash Operation | 25 |
| Free Operation | 48 |

In this standard, four patterns are provided for each weekday *AM*, *PM* and *OFF*-peak period and for weekend operation. Providing multiple AM, PM and OFF plan allows you to vary cycle, split, sequence and/or offset for each time period. This is very useful if you want to vary the split times 2 or 3 times over a peak hour but maintain the same coordination cycle and sequence.

A numbering convention is also suggested for *Test Patterns*. This makes it easy to spot patterns in the time-of-day scheduler that were intended as test patterns. You should copy a test pattern to one of the *AM*, *PM* or *OFF* patterns when you are satisfied with the operation.

Pattern 20 is assigned as a *Manual Control Plan* to provide a temporary pattern for StreetWise manual downloads. The manual control feature in StreetWise allows you to force the controller to run pattern 20 and specify a time-out value (in minutes) that allows the controller go back to time-of-day operation. By convention, you should never call for Action 20 (or Pattern 20) in the time-of-day scheduler. Use Pattern 20 as a "scratch" plan to download manual plans to the controller. This convention keeps the time-of-day plans and your temporary manual control plans separated.

The *Incident Patterns* (21 - 23) in the standard Data Template can be used to handle freeway incidents if the signal controls a freeway interchange. You can also provide incident plans for arterial plans once your AM, PM and OFF peak plans are established. For example, by increasing the cycle length of an AM plan 15-20% and assigning the additional time to the main street through phases, you can provide an AM incident plan to "clear out" a main street queue problem following an incident.

Pattern 24 and split 24 are reserved for your own use. Action 25 calls Pattern 255 (flash) and is suggested as the standard action event for *Flash Operation* in the scheduler.

Action 48 calls Pattern 48 in the Pattern Table and is used for *Free Operation* in this standard. Action 0 / Pattern 0 also provide free operation using sequence #1 (dual lead turns). However, this standard recommends that you use Action 48 / Pattern 48 for free operation so you can specify the phase sequence for Pattern 48 in the Pattern Table. This method also allows you to specify an alternate detector map during free operation to defeat detector diagnostics during late-night operation when no-call errors are expected (this is fully explained in TecNote 3011). Other options selectable by pattern (such as Max II selection) can also be specified for if free operation is selected by a pattern number other than zero.

## Standardize The Scheduler For Your System

This Data Template schedule Day Plan #1 to Monday - Friday, Day Plan #2 to Saturday and Day Plan #3 to Sunday.

You may want to refine the scheduler for your system. For example, you can schedule a separate day plan for each day of the week and use the Copy Day Plan feature to duplicate day plans for Monday through Friday that initially contain the same time-of-day schedule. However, keep in mind the additional complexity of maintaining a separate day plan for each weekday compared with one day plan for Monday - Friday.

Modify the Scheduler using "Easy Schedule" from the Main Menu using keystrokes MM->4-2:

| # | Day | Mo:From-Thru | DOM:From-Thru | Plan |
|---|---|---|---|---|
| 1 | M-F | 01-12 | 01-31 | 1 |
| 2 | SAT | 01-12 | 01-31 | 2 |
| 3 | SUN | 01-12 | 01-31 | 3 |

Also make sure that you have set Action 48 as the default for each Day Plan under menu MM->4->4. Set an event ("Evt") at 00:00 with an action value ("Actn") of 48. for Day Plans 1 through 24. This will insure that the controller defaults to free operation using the sequence provided in the Pattern Table for Pat# 48 as discussed in the last section.

## Standardize The Com Parameters For Your System

Modify the Com parameters for your system. The controller ID for the Data Template is 850. Customize these settings for your system baud rate, duplex setting, etc. Setting these defaults can save you a lot of time later on when you customize your controller data for each intersection.

## Standardize System-Wide Emergency Vehicle Preempts

Many agencies provide system-wide emergency vehicle preemption and standard preempt definitions and timings may be suitable as defaults for the Data Template. The inclusion of these defaults is left to the user as an exercise.

## Step 4 - Upload and Save the "Data Template" to Controller ID 850

Once you have completed updating the controller database with the defaults discussed in Step 3:

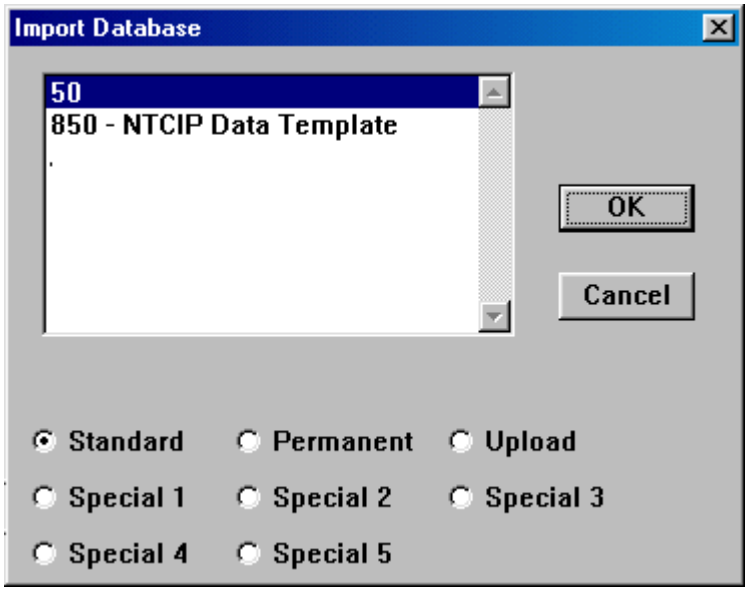
1. Upload the controller data to an NTCIP version 50 controller in StreetWise using ID 850.
2. Save your "Upload" file to the "Standard" and "Permanent" Files from the *Utilities* menu for ID 850.

## Step 5 - Import the "Data Template" to the "NTCIP Temporary File"

This is the point where you begin converting your existing TS-1 data files. The "Data Template" was built in Step 2 from the default data when the controller was initialized along with the modifications you provided in Step 3. At the end of Step 3, the "Data Template" was uploaded and saved to ID 850 in StreetWise.

The ID 850 "Data Template" will not be modified again. A "Tempory File" (ID 851) will be used to import the "Data Template" (ID 850). This intermediate data file protects the "Data Template" and also lets you copy-and-past from the TS-1 data file as much as possible.

Go ahead and "View" ID 851, the "NTCIP Temporary File" from StreetWise. Now, select "Utilities" from the "NTCIP Temporary File" pull-down menu and select ***Import Database***




Select the database "850 - NTCIP Data Template" . The "Standard" file radio button is already selected. Remember, you uploaded the "Data Template" from the controller and saved it to the *Standard* and *Permanent* files.

Press "OK" to import the "Data Template" to the "NTCIP Temporary File"

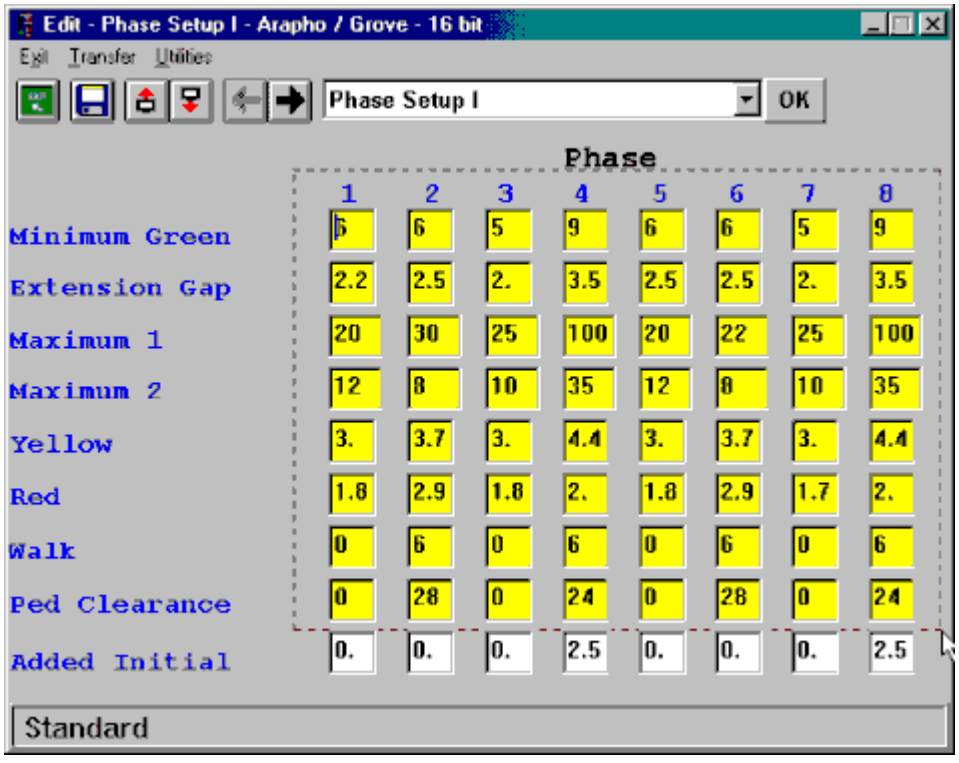
## Step 6 - Modify the NTCIP "Temporary File" Using the Old TS-1 Data File

The following examples apply to the Richardson TS-1 controller and may vary slightly for other TS-1 controller types. You should already have the "NTCIP Temporary File" open from Step 5. Now, open the TS-1 data file that you want to import to NTCIP. We will begin converting the old data using copy-and-paste from within StreetWise.

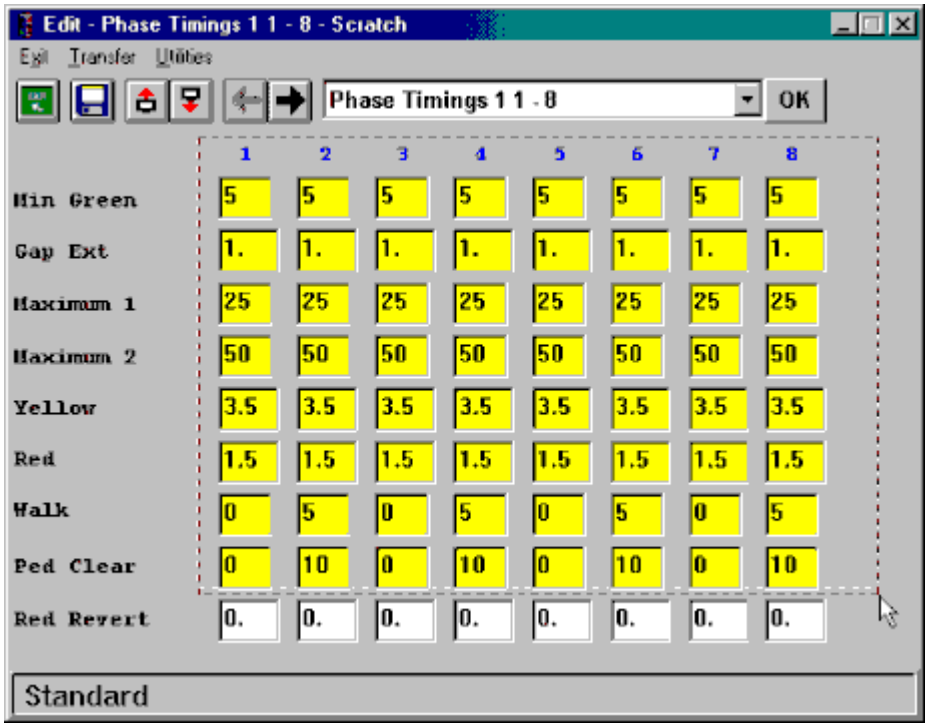
### Copy-and-Paste

Use copy-and-paste as much as possible to minimize the conversion time and errors. The following screen shows a copy-and-paste operation from TS-1 data screen. You must click at the top left-hand corner and hold the left mouse button down as you drag a rectangular window across the portion of the screen that you want to copy from. Notice the dashed lines that appear after you highlight this area.

To complete the copy operation, you can hold down the <ctrl> key and type "c" or you can select "Copy (Ctrl+C) from the *Utilities* menu of this screen. In the example below, notice that we did not highlight the "Added Initial" on the TS-1 data screen since there is not a corresponding entry on the NTCIP data entry screen.



Then, highlight the screen that you want to paste to in the same way. Either hold the <ctrl> key and press "p" or select "Paste (Ctrl+P) from the *Utilities* menu of this screen to complete the paste operation. The order of the data in the NTCIP version will be slightly different, so you will need to use a combination of copy-n-paste and manual entry. However, keep in mind that cut-n-paste is available because it can save you a lot of time and help maintain accuracy in the database translation.



Use the above method to update the following screens in the "NTCIP Temporary File" from the TS-1 data file. This is the portion of the database that varies from controller to controller and could not be included in the "Data Template" we defined in Step 1 - 4.

| TS-1 Data Screen<br>(Existing TS-1 Database) | NTCIP Data Screen<br>(Temporary Data File) |
|---|---|
| Phase Setup I<br>Phase Setup II | Phase Timings 1 1-8<br>Phase Timings 2 1-8 |
| Phase Options 1 | Phase Options 1 - 8 |
| Flash Initialization | Auto Flash<br>Channel Assignments 1 - 8 |
| Detector Maps | Vehicle Options<br>Vehicle Parameters+ |
| Plan 1-24 Normal Mode | Split Tables 1-24<br>Pattern Table |
| Preempt Options / Preempt Parameters<br>(not defined in the data template) | Preempts / Preempts+<br>(not defined in the data template) |
| Overlaps<br>(not defined in the data template) | Overlaps<br>(not defined in the data template) |
| Day Types<br>Schedule / Exception Types | Day Plans<br>Action Tables |

## Step 7 - Import the "Temporary File" to the New NTCIP File

This step completes the database conversion you began in Step 5.

1. Delete the TS-1 controller ID you have been working on
2. Re-create this ID using the NTCIP controller type
3. Use the "*Import database*" feature to import the "Temporary File" to the new ID

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