

SIEMENS TRAFFIC CONTROLS,

Sopers Lane,

POOLE, Dorset.

BH17 7ER.

SYSTEM/PROJECT/PRODUCT: STC UTC

**Plan Preparation Handbook**  
**for an**  
**STC UTC System**

This is an unpublished work the copyright in which vests in Siemens plc. All rights reserved.

The information contained herein is the property of Siemens plc and is supplied without liability for errors or omissions. No part may be reproduced or used except as authorized by contract or other written permission. The copyright and the foregoing restriction on reproduction and use extend to all the media in which this information may be embodied.

**ISSUE STATE**

Note :- Source of documents is shown under Type as below.

1=Paper, 2=VAX, 3=Microfilm, 4=CALTEXT Disc, 5=DECmate Disc,

6=Paper Insert, 7=MAC Disc, 8=LIFESPAN, 9=SUN, 10=Other - add note \*.

The document comprises the following components :-

<b>Pages</b>	<b>Current Issue</b>	<b>Type</b>	<b>Part ID</b>	<b>File ID</b>
All	34		666HP16940000	hp16940_V34_final.docx

\* Note: document stored under AMW

**CONTENTS**

- 1. INTRODUCTION ..... 6**
  - 1.1 Purpose..... 6**
  - 1.2 Scope..... 6**
  - 1.3 Related documents ..... 6**
    - 1.3.1 666/UH/16940/000 Systems Requirement Specification for an STC UTC System.....6
    - 1.3.2 666/UH/16940/xxx Customer Requirements Specification .....6
    - 1.3.3 666/HE/16940/000 System Handbook for an STC UTC System .....6
    - 1.3.4 666/HB/16940/000 Operators Handbook for an STC UTC System.....6
    - 1.3.5 666/HF/16940/000 SCOOT User Guide.....6
    - 1.3.6 666/HG/16940/000 System Management Handbook for an STC UTC System.....6
    - 1.3.7 666/HD/16940/000 Data Preparation Handbook for an STC UTC System.....6
    - 1.3.8 666/HI/16940/000 Data File Format Guide for an STC UTC System .....6
    - 1.3.9 666/HB/16101/003 SCOOT V4.2 Traffic Handbook .....6
    - 1.3.10 666/KE/16066/000 UTC Glossary of terms.....6
    - 1.3.11 666/HT/16940/000 Timetable Preparation Handbook for an STC UTC System.....6
  - 1.4 Definitions..... 6**
  - 1.5 Issue state and amendment..... 6**
- 2. INTRODUCTION TO PLAN PREPARATION ..... 8**
  - 2.1 General..... 8**
  - 2.2 Arrangement of Handbook..... 8**
- 3. RUNNING THE PLAN PREPARATION PROGRAM ..... 9**
  - 3.1 Starting the Program..... 9**
  - 3.2 Implementing Changes in the On-line System..... 9**
  - 3.3 Off-Line Plan Preparation..... 9**
- 4. PLAN PREPARATION ..... 10**
  - 4.1 Introduction ..... 10**
    - 4.1.1 Window Management and Special Key Functions ..... 11
  - 4.2 Start-up Screen..... 12**
  - 4.3 View Window ..... 13**

- 4.4 Changing the View ..... 15**
- 4.5 Edit Window..... 16**
- 4.6 Error Window..... 21**
- 4.7 Bad Plan Lines..... 22**
- 4.8 Creating a New SCOOT Plan..... 23**
- 4.9 Copying a Plan ..... 24**
- 5. PLAN LINE DESCRIPTIONS ..... 25**
- 5.1 Intersection Fixed time plans..... 25**
  - 5.1.1 Demand dependent and alternative stages..... 25
  - 5.1.2 Demand dependent stages with demand bits ..... 25
  - 5.1.3 "Complex" events..... 26
  - 5.1.4 Gap Out ..... 26
  - 5.1.5 Inhibit timings checks ..... 26
  - 5.1.6 Inhibit plan compliance checks ..... 26
  - 5.1.7 Suppress pedestrian phases ..... 26
- 5.2 Pelican Fixed Time Plans..... 27**
- 5.3 Intersection SCOOT Stage Translation Plans ..... 28**
- 5.4 Pelican SCOOT Stage Translation Plans..... 28**
- 5.5 Green Wave Plans ..... 28**
- 5.6 Improved Gap Out ..... 29**
- 5.7 Manual Waves..... 30**
  - 5.7.1 Introduction..... 30
  - 5.7.2 Operation..... 31
- APPENDIX A - ERROR MESSAGES ..... 33**
- APPENDIX B - PC KEYBOARD MAPPING..... 35**

## 1. INTRODUCTION

### 1.1 Purpose

This document describes how to use the Plan Preparation facility of an STC Urban Traffic Control System (UTC), hereafter referred to as the System, to enter, change and process System data.

### 1.2 Scope

The document is written for day to day users of a System which is capable of running SCOOT Version 2.4 or later. Users of the handbook should have attended an STC Data Preparation training course.

This document contains example screens. These are intended to be examples only and are correct at the time of document issue.

### 1.3 Related documents

Note: In the references below, the characters 'xxx' substitute for the 3 digit number which uniquely identifies a particular UTC System i.e. the customer variant for these documents.

1.3.1	666/UH/16940/000	Systems Requirement Specification for an STC UTC System
1.3.2	666/UH/16940/xxx	Customer Requirements Specification
1.3.3	666/HE/16940/000	System Handbook for an STC UTC System
1.3.4	666/HB/16940/000	Operators Handbook for an STC UTC System
1.3.5	666/HF/16940/000	SCOOT User Guide
1.3.6	666/HG/16940/000	System Management Handbook for an STC UTC System
1.3.7	666/HD/16940/000	Data Preparation Handbook for an STC UTC System
1.3.8	666/HI/16940/000	Data File Format Guide for an STC UTC System
1.3.9	666/HB/16101/003	SCOOT V4.2 Traffic Handbook
1.3.10	666/KE/16066/000	UTC Glossary of terms
1.3.11	666/HT/16940/000	Timetable Preparation Handbook for an STC UTC System

### 1.4 Definitions

For all definitions and abbreviations used in this and related UTC documentation see reference 1.3.10.

### 1.5 Issue state and amendment

Issues 01.00 to 09.00 Not issued.

Issue 10.00	First issue to align with V10 software.
Issue 11.00 to 14.00	Not issued
Issue 15.00	Converted to Word format and updated to reflect version 15 of the UTC system
Issue 16.00	Not issued
Issue 17.00	updated to reflect version 17 of the UTC system
Issues 18 to 20	Not issued
Issue 21	Updated to reflect version 21 of the UTC System
Issue 22	Not issued
Issue 23	Updated to reflect version 23 of the UTC System
Issues 24 to 27	Not issued
Issue 28	Updated
Issue 29 to 33	Not issued
Issue 34	Support for junction PV control bit

## **2. INTRODUCTION TO PLAN PREPARATION**

### **2.1 General**

The Plan Preparation process is used to prepare plan data for pelican and intersection controllers which may form part of a SCOOT node. The plan specify which control bits are to be sent to the on-street equipment and the sequence and time in which they are sent. The control bits are used to force particular stages to run and in a given order.

### **2.2 Arrangement of Handbook**

This handbook provides you with a guide to the running of the data preparation program in order that data may be entered concerning the configuration of the System and the parameters needed for the successful operation of the System.

The handbook is laid out in a way which follows the menu structure of the data preparation program. Appendix A - describes the error messages which may be produced during the processing of the data.



### **3. RUNNING THE PLAN PREPARATION PROGRAM**

#### **3.1 Starting the Program**

Plan preparation may run from any UTC System terminal provided that the logged in user has a sufficiently high level of access.

It should be noted that the System will only allow one user to run the plan preparation program at any one time.

Plan Preparation is also linked to Data Preparation and Timetable Preparation; therefore if either of these programs is being run, the Plan Preparation program will not be able to run.

The plan preparation program is started either by typing PPRP<RETURN> on a character terminal or in an MMI command entry box or by selecting Manager/ PPRP from the MMI UTC Session Manager Menu bar.

#### **3.2 Implementing Changes in the On-line System**

When the entry, amendment and processing of the data has been successfully completed the changed data will automatically be introduced in to the running UTC System and take immediate effect.

#### **3.3 Off-Line Plan Preparation**

Sometimes an update (UPDA) command will be rejected with a message which informs the user that he should run off-line plan preparation before attempting the UPDA again. This is to ensure that the on-line and off-line copies of the plan data are consistent.

To run off-line plan preparation the user should run the data preparation program (DBAS) and select "Correct errors in Plan Preparation" option from the DBAS Preparation menu. After the plan data has finished loading the user should exit the plan preparation process normally, using the <Control-Z> key combination. The off-line plan data will then update the on-line data. The update process can then be attempted again.

## 4. PLAN PREPARATION

### 4.1 Introduction

The Plan Preparation screen is divided into a number of areas, each of which is referred to in this document as a “window” The “windows” enable plan data to be viewed whilst editing. The two main “windows” are the View Window and the Edit Window, used for viewing and editing plan data respectively. There is also an Error Window which appears when the plan being edited is checked and is found to contain errors or warnings.

The plan preparation process is used to prepare plan data for intersection and pelican controllers. The plans specify which control bits are to be sent to the on-street equipment and the sequence and time in which they are sent. This process is initiated from the UTC command PPRP.

If a SCOOT node SCN is specified the plan type defaults to SCOOT if no plan type string is given. If the SCN parameter is omitted, plans for all equipment are displayed.

The syntax is the following :

```
-PPRP [SCN] [FIXEDTIME | SCOOT | GREENWAVE | TEST] [PLAN]
```

where :

[ ... ]	The text in brackets is optional;
...   ...   ...	Choose one of the options;
SCN	Equipment SCN;
FIXEDTIME	)
SCOOT	) The type of plan to be modified
GREENWAVE	) in this session of plan preparation;
TEST	)
PLAN	Plan number to be edited.

The SCN is either a UTC SCN (junction, pelican or sub-area) or a SCOOT node SCN. The plan number will be in the range 1 to 147, corresponding to the following plan types :

1 - 40	: Fixed time plans;	"F"
41 - 46	: SCOOT stage translation plans;	"S"
47	: Test Plan (see the VARY command);	"T"
48 - 147	: Green Wave plans	"G"

The plan type description (e.g.FIXEDTIME) can be replaced by the first letter, i.e. "F", "S", "T" or "G". If one of the plan types is defined in the command line (i.e. "F", etc.) then the plan number used is offset from the first plan of that type with the appropriate range being checked accordingly. The following table gives examples using the plan description and the equivalent plan number with in range, and out of range examples :

Plan Number	Type Description	Plan Edited	Equivalent plan without the description
1	FIXED	F 001	1
1	SCOOT	S 001	41
1	TEST	T 001	47
1	GREENWAVE	G 001	48
100	<none>	G 053	100
5	TEST	out of range	(range is 1 only)
50	FIXED	out of range	(range 1 to 40)

Example command lines are:

-PPRP	start plan prep with the default setup of editing all fixed time plans for all equipment (pelicans and intersections)
-PPRP J12111	edit all fixed time plans for the given SCN
-PPRP J12111 F 1	edit fixed time plan 1 for the given SCN
-PPRP S 1	edit SCOOT plan 1 for the given SCN
-PPRP G	edit all green wave plans.

#### 4.1.1 Window Management and Special Key Functions

The following keys are used to manage the various windows used by Plan Preparation:

X Terminal keyboard	Description
<Help>	Display help (dependent on the currently active window)
<Prev>	Scroll window up to show previous screen.
<Next>	Scroll window down to show next screen.
<PF1><Up>	Expand size of window (shrinks other windows).
<PF1><Down>	Shrink size of window (expands other windows).

<PF1>E	Select Edit window (when shown).
<PF1>R	Select Error window (when shown).
<PF1>V	Select View window.
<Insert Here>	Insert new event in plan line
<Remove>	Remove (delete) an event from the plan line

Note: The PC keys specified are the keys on a standard 101/102 key PC keyboard with the PC running X windows emulation software (Xvision or Hummingbird eXceed). The location of the various keys is shown in Appendix B

## 4.2 Start-up Screen

The following shows an example screen after entering the command :

-PPRP

at a terminal which has level 16 access.

```

                                Plan Preparation

View (PF1-V)-----
SCN [A00000] Plan [F][000] Local [Y] Errors [N] descriptive History [N]

SCN Plan Mode Events

J01111 001 CY090 A 10, B 30, AB 32, C 60, AC 62

J01211 001 CY040 A 0, B 20

J01221 001 LOCAL

J01231 001 LOCAL

J02111 001 LOCAL

J02221 001 LOCAL

J02231 001 CY040 A 0, B 20, AB 22

J02321 001 LOCAL

J03111 001 LOCAL

J03112 001 LOCAL

J03121 001 LOCAL

J03131 001 CY090 A 10, B 30, AB 32, C 60, AC 62

J03211 001 LOCAL

J03311 001 LOCAL

J03321 001 LOCAL

```

J04111 001 CY060 A 12, B 40, AB 42, C 56, AC 58

J05111 001 CY096 A 0, B 34, C 48, CD 50, D 62 <BAD>

Keys PF2/Help: Help Up, down, Prev, Next: Move selection

SPACE: Change view RETURN: Edit highlighted plan C: Copy to edit window

R: Copy Range Q:Quit F10: Exit Insert,Remove: Green wave controller

It should be noted that the System only allows one user to run the Plan Preparation program at any one time. In addition, if either DBAS (Database Preparation) or TTBP (Timetable Preparation) is being run elsewhere on the System, PPRP will not be available.

### 4.3 View Window

The view criteria may be changed at any time, even when editing plan data in an Edit Window.

No actual editing is performed in the view window.

The screen is divided into information and data items which are described below.

- (a) The first two lines are informational, giving the screen name and current view.
- (b) First data line. The values in square brackets are the current values being used.

SCN                      The current SCN or wild carded range. In this example, all equipment (i.e. junction and pelican controllers) on the System are to be displayed for editing. "N" may also be selected to show controllers with SCOOT nodes.

Plan                      F = fixed time plan.  
                             T = test.  
                             S = SCOOT.  
                             G = Green wave.  
                             000 = all plans of the defined type - i.e. fixed time in this case.

Local                     If set to N then all plans are displayed.  
                             If set to Y then only non-local plans are shown.

Errors                    = Y Display plan lines with errors only.  
                             = N Display plans with and without errors.

Descriptive History     This option is only available when a single equipment and plan is selected. This shows the last few changes made to that plan. Selecting "Y" in this field shows the date, time, user ID and a description of the changes made to the plan.

- (c)                      Equipment SCNs and plan lines

The first column shows the SCN(s) that are available for editing.

The second column shows the plan number.

The third column shows the plan line itself.

See section 5 for a description of the plan line.

(d) Help on the available commands

One row of data will be highlighted. This is the 'currently viewed plan'. This plan may be selected for editing in an edit window. The cursor keys and the previous/next screen keys allow the selection to be moved to a different plan.

The following keys are used:

<F10>	Exit Plan Preparation. All changes made to the data are saved. When running on-line, the data on the System is updated immediately. You are asked to confirm this option.
Q	Quit Plan Preparation. All changes made to the data are lost. You are asked to confirm this option.
<Down>	Next Line. Move the currently viewed plan to the plan shown on the next line of the view window. Note that when a large amount of data is selected by the View Criteria, it will not all fit into the view window. The <Down> key scrolls the display down one line to enable more data to be seen.
<Up>	Previous Line. Opposite of <Down>, see above.
<Next>	Next screen. Scrolls the display down a screenful of data at a time. (PC Key : <Page Down>.)
<Prev>	Previous Screen. Opposite of <Next>, see above. (PC Key : <Page Up>.)
<Right>	Scroll Right. If the data occupies more columns than the screen can show, a bold ">" appears on the right hand side of the row. This key scrolls the display four characters to the right allowing more data to be seen.
<Left>	Scroll Left. Opposite of <Right>, see above.
<RETURN>	Select the 'currently viewed plan' for editing. An Edit Window will appear to allow you to change the plan data (see section 4.5).
C	Copy the currently viewed plan into the plan shown in the Edit Window. The plan in the edit window must be for the same controller SCN and be of the same type. A Fixed Time plan cannot be copied into a SCOOT plan for example. The only exception is TEST plans which are interchangeable with Fixed Time plans. A detailed description of the plan copy process is shown in 4.9

- R Range copy. When a number of controller plans have been selected by the View Criteria, but for a specific plan, they may be copied into another plan. You are asked for a destination plan to copy them to, and a comment for the Plan History. You may elect not to overwrite plans where the controller is not under LOCAL control.
- <Insert> Add controller to a green wave route (when displaying a green wave plan). You are asked for the SCN of the controller to be added to the green wave. An Edit Window appears to allow you to add the controller of the Green Wave route.
- <Remove> Remove controller from a green wave route (when displaying a green wave plan). An Edit Window appears containing the plan and you are asked to confirm the action.
- <Space> Change the current View Criteria. See Section 4.4 for further details.

#### 4.4 Changing the View

When the SPACE bar is pressed, the following two lines appear at the bottom of the screen :

```
(S)CN (P)lan (E)rrors (L)ocal (H)istory (F)inish
Press the key for your choice
```

Each option controls the display of the following :

- P Plan. You are prompted to enter the plan type (F, T, S or G) and the corresponding plan number (or 0 for all plans of that type).
- S SCN. You are prompted for the equipment letter (J, P, A or N) and SCN number to match against the plan data. Wildcards may be used.
- L Local. Toggles whether to filter out plan data where the controller is under local control. If it is set to 'Y' only plans which are NOT local are shown.
- E Errors. Toggles whether or not only plans which contain errors are displayed. Selecting this option allows erroneous plans to be located quickly, eg after a UTC/SCOOT Data Preparation session).
- H Descriptive History. When a specific plan number and SCN have been given, the view window displays the last few changes made to that plan, including date, time, user ID and a description of the changes.

Press <RETURN> to accept the view criteria you have selected and display all plan data matching the criteria.

The second row of the View Window gives column headings. Below these, in columns, the plan data (as selected by the view criteria) is shown.

One row of data is highlighted. This is the 'currently viewed plan', which may be selected for editing in an edit window. The cursor keys and previous/next screen keys allow the selection to be moved to a different plan.

The following shows the screen after choosing a single junction SCN with all plans.

```

Plan Preparation
View (PF1-V)-----
SCN [J11111] Plan [F][000] Local [Y] Errors [N] descriptive History [N]
SCN Plan Mode Events
J11111 001 LOCAL
J11111 002 LOCAL
J11111 003 LOCAL
J11111 004 LOCAL
J11111 005 LOCAL
J11111 006 CY112 A 50, B 76, C 88, AC 90
J11111 007 LOCAL
J11111 008 LOCAL
J11111 009 CY076 B 10, C 20, AC 22, A 50
J11111 010 CY090 B 10, C 24, AC 26, A 64
J11111 011 LOCAL
J11111 012 LOCAL
J11111 013 LOCAL
J11111 014 LOCAL
J11111 015 LOCAL
J11111 016 LOCAL
J11111 017 LOCAL
Keys PF2/Help: Help Up, down, Prev, Next: Move selection
SPACE: Change view RETURN: Edit highlighted plan C: Copy to edit window
R: Copy Range Q:Quit F10: Exit Insert,Remove: Green wave controller

```

## 4.5

### Edit Window

When the Edit Window appears, the first event in the plan will be shown in reverse video. This is the 'current event'. The title of the window will be shown in reverse video to show that it is active, and some of the more common keys which you may press to change or accept the plan data are shown at the bottom of the screen. The full list of keys which you may press when the Edit Window is active is shown below.



The leftmost columns of the Edit Window show information about the plan being edited, such as the SCN, plan type, plan number and the name of the plan. The rightmost columns of the Edit Window show the actual plan data.

Normally, in addition to the single line representation of the plan data, a list of the stages on the controller is shown. A stage letter is shown in bold if it is demand dependant. Additionally, a stage letter is shown in reverse video if that stage is not forced in the current plan.

It is possible to show a graphical representation of the plan. One line of the display represents each configured stage on the controller. The stage letter is shown at either end of the line (again, in bold if demand dependant and reverse video if not forced in the plan). Vertical lines separate the events in plan, with the event offset being shown at the top of the line. The stages being forced in each event are shown as horizontal lines, from the start of the event in which they are forced to the end of the event(s) in which they are forced.

The stage lines in the graphic are shown as single dashes (----) if the stage being forced is demand dependant and the demand bit is not being sent as well. When a non demand dependant stage, or a demand dependant stage with the relevant force bit, is being forced, the stage lines are shown as double dashes (====). If a 'wild' demand bit is being sent (i.e. a specific demand bit is sent without the stage force bit), the stage line is shown as dots (.....). In addition, the stage lines will be shown in reverse video if the Gap Out (GO) bit is selected.

Note: The test plan may only be edited using the VARY command.

The following display shows the screen after choosing the edit window.

```

                                Plan Preparation

View (PF1-V)-----
SCN [A00000] Plan [F][000] Local [Y] Errors [N] descriptive History [N]

SCN Plan Mode Events

J14161 001 LOCAL
J14171 001 LOCAL
J14181 001 LOCAL
J14191 001 LOCAL
J14241 001 LOCAL
J14251 001 CY084 A 0, F 18, G 42, H 60
J21111 001 CY060 B 17, AB 19, A 34
J21121 001 CY060 A 0, B 18, C 39
J21131 001 CY060 A 23, B 46
J21132 001 CY060 A 12, B 35

Edit (PF1-E)-----
CY084 A 0, F 18, G 42, H 60

```

```

SCN : J14251           Stages : ABCDEFGH

Mode : CY 84

Fixed Time 1

<no name>

Keys PF2/Help: Help A-H:stage A-H X:Demand V:Vehicles P:Pedestrian

Y:Gap Out M:Mode T:Time Z:Cycle Time O:Offset

<- ->:move to event Insert,Remove:insert,remove event F10:Cancel RET:Accept

```

The screen is divided into edit and key function areas. The edit area displays the plan being edited, junction SCN and mode etc. The key function area displays the common function keys, a full description of all function keys is available by pressing the help key PF2.

The keys used in edit mode are as follows:

- <Return> - Check and accept the plan data. If any errors are present in the plan, these will be shown in an Error Window (see section 4.6).
- <F10> - Cancel the current edit.
- <Left> - Edit the previous event.
- <Right> - Edit the next event.
- <Up> - Increase the current event offset (or duration) by 1 second.
- <Down> - Decrease the current event offset (or duration) by 1 second.
- <PF3> - Toggle the display of the plan graphic.
- <PF4> - Toggle the display of event times as offsets or durations. If durations are displayed, "DUR" is displayed on the plan line. (PC Key: <F4>)
- <Insert> - Insert a new event, following current event. This will be the same as the current event but with an event offset which is one second greater.
- , (comma) - Insert a new event, following current event. The new event will not have any stage force bits set. The event offset will be set to one second greater than the current event.
- <Remove> - Remove the current event. If there is only one event in the plan, the controller will be switched to LOCAL mode.
- T - Enter event offset (or duration, for Green Wave plans)
- Z - Set cycle time (Fixed Time plans only)
- O - Offset all events (Fixed Time and Green Wave plans only)

- M - Change plan mode, between LOCAL and CONTROLLED. For Fixed Time or SCOOT plans, the FM, LL or SL bit can be sent if the controller is configured appropriately. You are asked which mode is required when this key is pressed.

### Intersection plans:

- A to H - Send stage A to H (toggle). If the stage is demand dependant, the relevant demand bit will not be sent unless 'X' is pressed (Fixed Time or SCOOT plans). For Green Wave plans, the relevant demand bit will always be sent if the stage is demand dependant.
- X - Send demand bit (Fixed Time or SCOOT plans). The demand will be sent, if configured, when the event is active for the last demand dependant stage entered. If there is more than one possible stage for which a demand bit could be sent, you are asked which stage to send the demand for.
- W - Send 'wild' demand bit (Fixed Time or SCOOT plans). If there is more than one 'Dn' bit on the controller, you are asked which stage to send the demand for.
- Y - Send Gap Out (GO) bit (toggle). The GO bit must be configured on the controller.
- @ - Inhibit timings checks (toggle). The plan must contain one or more 'complex events' (an event where the GO bit, or the stage force bits for more than stage, or 'wild' demand bit(s) are being sent). When toggled on, the "stage minimum" timings checks are inhibited.
- \* - Inhibit plan event compliance checks. The plan must contain one or more 'complex events'. Plan compliance faults will be ignored when plan events are running which are marked to inhibit plan compliance checks.

### Alternative stage sequences:

For intersection controllers configured with an SD reply bit, the following keys may be used to define an alternative stage sequence.

- [ - Mark the current event as the first event in the primary sub-sequence.
- ] - Mark the current event as the last event in the secondary sub-sequence.
- : - Toggle between editing the primary and secondary sub-sequence.

### Pelican plans:

- V - Vehicle stage (send PV bit, don't send PX bit).

- P - Pedestrian stage (don't send PV bit, don't send PX bit).
- X - Pedestrian stage with force bit (don't send PV, send PX bit). The PX bit must be configured on the pelican.

**SCOOT plans:**

Numbers 1 to 7 - Set the event to be active on the corresponding SCOOT stage.

**Naming plans:**

- N - Name plan. You are prompted for the name for the current plan being edited. This name will be common to the plan for all equipment.

The following shows the edit window for the previous example when the PF3 key (graphical representation of the plan) is pressed.

```

                                Plan Preparation

View (PF1-V)-----
SCN [J14251] Plan [F][001] Local [Y] Errors [N] descriptive History [N]

SCN      Plan Mode      Events

J14251  001  CY084 A 0, F 18, G 42, H 60

Edit (PF1-E)-----

                                CY084 A 0, F 18, G 42, H 60

SCN : J14251           0   18   42   60

                                A|====|   |   |   |A
Mode : CY 84  B|   |   |   |   |B
Fixed Time  1 C|   |   |   |   |C
<no name>   D|   |   |   |   |D
                                E|   |   |   |   |E
                                F|  |====|   |   |F
                                G|   |   |====|   |G
                                H|   |   |   |====|H

Keys PF2/Help: Help  A-H:stage A-H  X:Demand  V:Vehicles  P:Pedestrian
    
```

```

Y:Gap Out      M:Mode      T:Time      Z:Cycle Time  O:Offset
<- ->:move to event Insert,Remove:insert,remove event F10:Cancel  RET:Accept

```

## 4.6 Error Window

The Error window displays errors in plan data when you try to accept changes made to a controller's plan which has been shown in an Edit Window. Each error is shown on a separate line. If the Edit Window is subsequently removed, the Error Window is removed at the same time.

If the errors are minor, you will be asked to confirm that the plan is acceptable before registering the edit. If the errors are serious, they must be corrected before the plan may be accepted.

Using the Window Management keys (see Section 4.1.1 for more details), it is possible to reduce or expand the size of the Error Window. This allows more or less of the View Window to be seen instead of rows of the Error Window. If there are more errors in the plan being edited than can be shown on the current size of the Error Window, it is also possible to scroll through the errors.

The following shows the error window which appears when the <RETURN> key is pressed, and the plan changes cannot be accepted.

```

Plan Preparation

View (PF1-V)-----
SCN [A00000] Plan [F][000] Local [Y] Errors [N] descriptive History [N]

SCN Plan Mode Events

J14161 001 LOCAL

J14171 001 LOCAL

J14181 001 LOCAL

J14191 001 LOCAL

J14241 001 LOCAL

J14251 001 CY084 A 0, F 18, G 42, H 60

J21111 001 CY060 B 17, AB 19, A 34

J21121 001 CY060 A 0, B 18, C 39

J21131 001 CY060 A 23, B 46

J21132 001 CY060 A 12, B 35

Error (PF1-R)-----

Minimum time violation: stage A should have been forced for 15 seconds

    by the end of event 2 (stage A min is 10 sec, i/g is 5 sec.)

Min time violation: stage A not forced for 15 seconds

```

from the start of event 2 (stage A min is 10 sec, i/g is 5 sec.)

```

Edit (PF1-E)-----
                                CY084 C 28, A65, B 66

SCN : J14251

                                Stages : ABC

Mode : CY 84

Fixed Time 1

<no name>

Keys PF2/Help: Help A-H:stage A-H X:Demand V:Vehicles P:Pedestrian

                Y:Gap Out M:Mode T:Time Z:Cycle Time O:Offset

                <- ->:move to event Insert,Remove:insert,remove event F10:Cancel RET:Accept

```

## 4.7 Bad Plan Lines

Plan lines marked with the <BAD> symbol normally only occur on converting from the previous version of plan preparation executed via the DBAS command. These are lines that passed the plan preparation with less severe error checking or timings have been changed on controllers causing minimum green violations, for example. To eliminate these faults in one pass the - PPRP command can be entered and only the errors displayed. This is done by choosing the (E)rrors option, setting it to Y, which displays all the error lines. For example :

```

Plan Preparation

View (PF1-V)-----

SCN [A00000] Plan [F][000] Local [N] Errors [Y] descriptive History [N]

SCN Plan Mode Events

J05111 001 CY096 A 0, B 34, C 48, CD 50, D 62 <BAD>

J11151 001 CY076 C 0, D 18, AD 20, A 36, B 59 <BAD>

J13131 005 CY102 C 2, AC 4, A 10, B 78 <BAD>

Keys PF2/Help: Help Up, down, Prev, Next: Move selection

                SPACE: Change view RETURN: Edit highlighted plan C: Copy to edit window

                R: Copy Range Q:Quit F10: Exit Insert,Remove: Green wave controller

```

If the previous example is processed by pressing the <Return> key, the following error is displayed, which should be corrected by allowing sufficient time for the marked stage (D) to run.

Alternatively, as a last resort, the plan line can be marked as inhibited for timings checks by setting the "@" parameter.

#### Plan Preparation

View (PF1-V)-----

SCN [A00000] Plan [F][000] Local [N] Errors [Y] descriptive History [N]

SCN Plan Mode Events

J05111 001 CY096 A 0, B 34, C 48, CD 50, D 62 <BAD>

J11151 001 CY076 C 0, D 18, AD 20, A 36, B 59 <BAD>

J13131 005 CY102 C 2, AC 4, A 10, B 78 <BAD>

Error (PF1-R)-----

Minimum time violation: stage D should have been forced for 18 seconds

by end of event 2 (stage D min is 8 sec, i/g is 10 sec.)

Edit (PF1-E)-----

CY076 D 18, AD 20, A 36, B 59, C 75

SCN : J11151

Stages : ABCD

Mode : CY 76

Fixed Time 1

<no name>

Keys PF2/Help: Help A-H:stage A-H X:Demand V:Vehicles P:Pedestrian

Y:Gap Out M:Mode T:Time Z:Cycle Time O:Offset

<- ->:move to event Insert,Remove:insert,remove event F10:Cancel RET:Accept

## 4.8 Creating a New SCOOT Plan

The following notes describe how to create a new SCOOT plan.

Assuming that the user wishes to create the plan line:

N01111 {A 0}1, {B 0, AB 2}2, {C 0}3

The starting point for a new SCOOT plan line will be:

N01111 {A 0}1

Press the comma key, to add a new event; the plan line will become:

N01111 {A 0, 1}1

Press the key "2" to convert the new event to a new stage:

N01111 {A 0}1, { 0}2

Press the "B" key to make the first event of stage 2 B0

N01111 {A 0}1, {B 0}2

Press the comma key to add a new event in stage 2

N01111 {A 0}1, {B 0, 1}2

Press the "A" and "B" keys followed by the up-arrow key to make the second event in stage 2 AB 2:

N01111 {A 0}1, {B 0, AB 2}2

Press the comma key to add a new event in stage 2

N01111 {A 0}1, {B 0, AB 2, 3}2

Press the key "3" to convert the new event to a new stage:

N01111 {A 0}1, {B 0, AB 2}2, { 0}3

Press the "C" key to make the event of stage 3 C0

N01111 {A 0}1, {B 0, AB 2}2, {C 0}3

#### 4.9 Copying a Plan

Plans which are for the same controller SCN and of the same type may be copied from the view window into the edit window. The notes below describe how to do this:

Make the plan which is to be the destination for the copy the currently edited plan.

Press PF1-V to move to the view window.

Use the up and down arrow keys to select the plan for the same controller which is to be copied.

Press C.

The message "Changes to plan data will be lost. Continue (Y/N):" will appear.

Press Y to proceed with the copy or press N to abort the copy.

If the copy has been performed, the copied plan will appear in the edit window.

Press PF1-E to return to the edit window and edit the copied plan as required.



## 5. PLAN LINE DESCRIPTIONS

### 5.1 Intersection Fixed time plans

Each line describes one plan for a single controller. The line starts with the SCN of the controller and is followed by the plan number, cycle time and stage action times.

For example :

```
J03131 001 CY090 A 12, B 40, C 56, D 78
```

The letters following the cycle time represent the stages on the controller, A for stage 1, B for stage 2, etc. In the above example all the stages are normal, i.e. not demand dependent, so the stage letter only is used with its action time.

The above example plan line means:

- The plan is number 1 for the intersection J03131
- The cycle time is 90 seconds. i.e. all the stage action sequences in the plan are repeated every 90 seconds. The start of the cycle is calculated from the Master Cycle Counter, which is a counter incremented once per second, having a manufacturer designated zero value on a specified date and specified time.
- "A 12" signifies that the single stage A force bit is sent by the UTC System to the controller starting 12 seconds after the start of the cycle.
- "B 40" signifies that the previous action is terminated 40 seconds after the start of the cycle, i.e. the A stage bit is no longer sent, and the B force bit is to be sent until the next event.

#### 5.1.1 Demand dependent and alternative stages

In the following example, Stage B is a demand dependent stage:

```
J04111 001 CY060 A12, B 40, AB 42, C 56
```

If demand from the street for stage B is received at the controller before its action time, or within the "window" of 40 to 42 seconds, then this stage should be returned by the controller after passing through the intergreen period. Note that unless the controller is configured with stage demand confirmation, either stage A continuing on the controller or its changing to B is valid for the UTC System. The alternative stage, i.e. A in this example, should not be demand dependent.

#### 5.1.2 Demand dependent stages with demand bits

The following plan line contains a demand dependent stage with stage demand bit:

```
J12131 CY040 A 0, B 20
```

The controller in this example has B as a demand dependent stage and must be configured with a stage demand control bit (DB in this case). At the stage event time for B both the B stage and DB demand bit are transmitted to the controller.

The following example is of a controller with a common demand bit:

J02141 CY 060 A 10, B 40

In this case the demand dependent stage B has no specific demand bit and the common demand bit (DX) is sent simultaneously to force the stage to be implemented.

### 5.1.3 "Complex" events

A plan line may contain one or more complex events, which are defined by one of the following :

- more than one stage force bit is sent to the controller at any one time;
- the "wild" demand bit (DX) being sent;
- the GO (Gap Out bit) is sent.

In all these circumstances it is the controller that decides which stage should be implemented.

The simplest case of a complex event is the demand dependent sequence. An example of a plan line with complex events is the following:

J01111 001 CY090 A 10, B 30, AB 32, ABC! 60

AB is the second half of the demand dependent sequence, and ABC! means the controller can move to any of the three stages without raising a plan compliance fault.

### 5.1.4 Gap Out

The Gap Out (GO) bit, when configured for a controller, can be sent with a complex event. The sending of the GO bit is indicated by a ! next to the event in the plan line. The controller itself can then choose to alter stages to another of the defined stages within this event without causing a plan compliance fault to be raised.

### 5.1.5 Inhibit timings checks

In some circumstances it may be required to inhibit timings checks on a controller. This is made possible by entering the "@" parameter in the plan line. Note that this should be avoided where possible, as none of the minimum greens or intergreen timings on the controller are monitored and marked as faulty. The plan line must contain one or more complex events (see section 5.1.3) otherwise this parameter is not accepted. An example plan line is :

J11151 001 CY076@C 0, D 18, AD 20, A 36, B 59

### 5.1.6 Inhibit plan compliance checks

One or more events in a plan can be marked as inhibited for plan compliance checking. The plan must contain one or more complex events (see section 5.1.3). An example plan line is :

J11151 001 CY076 ABC\* 0, D 18, AD 20, A 36, B 59

The single event ABC is marked such that plan compliance faults will be ignored for this event only.

### 5.1.7 Suppress pedestrian phases

The PV bit is expected to have the following meaning for the controller: when PV is set, pedestrian phases shall be disabled; active pedestrian phases shall be terminated. The control

bit can be inserted into junction plans using "V" to toggle the state on or off for a particular event.

It is being added specifically for North American controllers but could have applicability elsewhere. The general problem in North American controllers is that pedestrian phases run in parallel with vehicle phases and often have very long clearance times because of the width of the roads. This creates problems with split optimisation, end lag and long intergreens (typically up to 25 seconds) as the pedestrian clearance doesn't start until the force bit for the next stage is received. The purpose of the PV bit is that it can be sent "clearance time" seconds before the end of the stage - so the clearance time has expired by the time the next stage starts. The split optimiser has the benefit of including information calculated during the "clearance period" timing. As PV is already used as for pedestrian terminate/disable it has been reused in this enhancement.

E.g. a SCOOT plan segment could look like this:

```
{A 0; AV 29}1 {B 0}2 .....
```

The events after the semi-colon are events that will be executed relative to expected end of SCOOT stage. So in this plan, force A + PV would be sent 29 seconds before the end of SCOOT stage 1.

This allows for a clearance time of 25 seconds in case the split optimiser reduces the stage by 4 seconds. So the pedestrian clearance will always have run by the time SCOOT stage 2 starts, but the pedestrian phase will extend as the SCOOT stage extends.

The PV control bit can be added to the word format in database preparation. The controller must have the appropriate capability to implement the PV bit functionality.

## 5.2

### Pelican Fixed Time Plans

Each line describes one plan for a single pelican. The line starts with the SCN of the pelican and is followed by the plan number, cycle time and stage action times.

For example :

```
P02333 001 CY040 P 0, V 2
```

The letters following the cycle time represent the pedestrian and vehicle stages on the pelican, P for pedestrians and V for vehicles. The above example plan line means :

- The plan is number 1 for the pelican P02333
- The cycle time is 40 seconds. i.e. all the stage action sequences in the plan are repeated every 40 seconds.
- "P 0" signifies that the pedestrian stage bit is sent by the UTC System to the controller starting 0 seconds after the start of the cycle.
- "V 2" signifies that the previous action is terminated, i.e. the pedestrian stage bit is no longer sent, and the vehicle force bit is to be sent until the next event.

### 5.3 Intersection SCOOT Stage Translation Plans

SCOOT plan lines define the relation between UTC stages and SCOOT stages. The following example shows the normal one-to-one relationship where UTC stage A is defined as SCOOT stage 1, etc. :

```
J02221 001 N02221 {A 0}1, {B 0}2, {C 0}3
```

In a similar fashion as for UTC fixed-time plans, the plan line is made up of the following items: the UTC equipment, the SCOOT plan number, the node number, and the SCOOT stages. The example is of a single-node 3-stage controller with no demand dependent stages. The following example is of a single-node 3-stage controller with B and C being demand dependent :

```
J01111 001 N01111 {A 0}1, {B 0, AB 2}2, {C 0, AC 2}3
```

In this case the controller will change if there is on-street demand.

The example below is similar to the previous, except that demand dependent stages B and C are forced with their respective stage demand bits (DB and DC, respectively) :

```
J03121 001 N03121 {A 0}1, {B 0}2, {C 0}3
```

### 5.4 Pelican SCOOT Stage Translation Plans

The Pelican translation plan is as shown in the following example :

```
P01123 001 N01123 {P 0, V 2}1, {V 0}2
```

The plan line consists of the Pelican SCN, the SCOOT plan number, the node SCN, and two events: P for the pedestrian stage and V for the vehicle stage. In this case the pedestrian stage is the same as SCOOT stage 1 and the vehicle stage is SCOOT stage 2. The vehicle event in the first stage gives a two second window to pedestrian demand.

### 5.5 Green Wave Plans

The following is an example of a green wave screen, having selected to edit green wave number 2 :

## Plan Preparation

View (PF1-V)-----

SCN [A00000] Plan [G][002] Local [Y] Errors [N] descriptive History [N]

SCN Plan Mode Events

J02221 002 OFFSET 47 b 40

J02231 002 OFFSET 59 a 49

P02243 002 OFFSET 59 v 40

P02213 002 OFFSET 82 v 30

P02313 002 OFFSET 94 v 30

J02321 002 OFFSET 100 a 50

J02111 002 OFFSET 112 a 30

P02333 002 OFFSET 134 v 30

J01221 002 OFFSET 137 a 40

J01231 002 OFFSET 163 a 40

P01123 002 OFFSET 223 v 30

J01111 002 OFFSET 233 a 40

Keys PF2/Help: Help Up, down, Prev, Next: Move selection

SPACE: Change view RETURN: Edit highlighted plan C: Copy to edit window

R: Copy Range Q:Quit F10: Exit Insert,Remove: Green wave controller

The green wave events are listed in start (OFFSET) order, irrespective of the type of equipment. The offset is the time from the start of the green wave to the point where the required controller stage starts. Each line defines the equipment SCN, green wave plan number, offset, stage (underlined for forcing a demand dependent stage) and its duration. For pelicans the "v" signifies vehicle stage.

## 5.6 Improved Gap Out

The improved gap out facility allows the user to specify a stage in a plan line which has no events. An example of such a plan line is

```
{A 0}1, {}2, {}3
```

This would mean that for most of the cycle the controller would operate under VA and once per cycle would come under control with only the offset being effective.

A stage without any events is known as a 'Gap Any Event'.

Users should be aware that stage A may not run when requested. For instance, if the controller under VA starts moving into stage B one second before SCOOT stage 1 starts the stage A will not start its preceding intergreen for  $\text{MIN}(B)+\text{IG}(?->B)$  seconds which may involve a substantial delay. (The ? represents the stage letter of the preceding stage).

The UTC software uses the SCOOT plan to work out the UTC stage number for each SCOOT stage. However, if the SCOOT plan line has empty events it cannot do this. The software has been modified so that it uses SCOOT translation plan 1 to calculate the UTC stages associated with each SCOOT stage. For this reason, **Gap Any Events should not be used in translation plan 1.**

Gap Any events are not specifically excluded from multi-controller nodes but the number of pseudo-stages which may result from their use on a multi-controller node could cause a 'Max pseudo stage' fault to be generated. Should this happen the number of Gap-Any events should be reduced.

## 5.7 Manual Waves

### 5.7.1 Introduction

Manual waves are a special case of green waves and are set up in exactly the same manner as described in section 5.5. The numerical values have no significance, but can be used to order the SCNs in numerical order or as required.

Manual waves are used to force one or more junction or pelican controllers to follow a specific stage as defined in the relevant green wave. An example manual wave screen is shown below:

```

-----
| MWAV 003 | | 26-NOV-93 12:22:22 |
| J03121 B B 180 | J03341 A 180 |
| J04131 D A 180 | J04121 A 180 |
| J03122 A A 180 | P03112 P V 180 |
| J02121 A A 180 G | J04142 A A 180 |
| J02311 A A 180 | |
| J02222 A A 180 | |
| P01111 V V 180 | |
| J03111 A A 180 | |
| J04111 A A 180 | |
| J02131 B B 153 | |
| J02331 A 180 | |
| J04141 A A 180 | |
| J02111 A A 180 | |
| J03351 C A 180 | |
| P02212 V V 180 | |
| J02211 A A 180 | |
| P01112 P V 180 | |
| J04211 C A 180 | |
| P01311 V V 180 | |
| * J02151 A 180 | |
| J03311 A B 180 | |
| P01222 V V 180 | |
| | |
| CURSOR UP/DOWN/LEFT/RIGHT PF1-Start/Reset PF2-Help PF3-Stop |

```

### 5.7.2 Operation

Start the manual wave screen by entering the command :

```
MWAV <green_wave_number>
```

For example :

```
MWAV 3
```

The equipment on the manual wave is displayed as :-

```
<*><SCN> <current stage> <green stage> <timer><G>
```

where :

<*>	Normally this will be blank but if the equipment is faulty then an asterisk is displayed. If the equipment is isolated then the asterisk will flash
<SCN>	The junction or pelican SCN
<current stage>	The current stage on the junction, or P/V for pelicans
<green stage>	The stage to be held (from the green wave plan)
<timer>	The maximum time for manual control. While under manual control the timer will count down each second.
<G>	Normally blank but if the equipment is under green wave control then a 'G' will be shown.

Select a junction or pelican using the cursor keys. The currently selected equipment is shown in reverse video.

To start or extend manual control on the currently selected equipment press the PF1 key. Press PF3 to stop manual control on the current equipment. Manual control may be active on more than one equipment at any time.



## Appendix A - Error Messages

If errors are found in the data when it is being processed, error messages will be output to the screen and written to a file as well. The file of error messages may be printed after the particular data processing phase has finished.

### Error and Warning Messages

UTC/SCOOT changes log file.

SCN x not found - plan data deleted.

SCN x - equipment removed from green wave plan y on TCC z.

SCN x - too many equipments on route y - plan has been deleted.

No plan data found for TCC x.

Controller is in local mode.

The event offset of the first event in a SCOOT Stage must be 0.

The event offset should not be between x and y seconds.

The event offset should be between x and y seconds.

The duration of a green wave event should be between x and y seconds.

The alternative stage sequence must not cross time  $t=0$ .

This plan already contains the maximum number of events.

There must be at least 1 second between event offsets.

Not valid for this type of plan.

Invalid event at which to start alternative stage sequence.

Invalid event at which to end alternative stage sequence.

No alternative stage sequence is defined.

Only valid for intersection plans.

Only valid for pelican plans.

SCOOT stage order not valid.

This mode of control is not valid for this type of plan.

Cycle time is too large - maximum is x seconds.

Cycle time is too small - minimum is x seconds.

Offset is too large - maximum is x seconds.

Offset is too small - minimum is x seconds.

No events with GO bit, multiple DD stages or wild 'Dn' bits.

Timings checks are not inhibited.

Too many equipments in green wave route.

Unable to allocate memory to check plan data.

No demand dependent stages with 'Dn' bits

### Appendix B - PC Keyboard Mapping

The partial keyboard map shown below is applicable when Plan Preparation is being run from a PC running Exceed. The key functions needed for Plan Preparation are shown in red.

<b>Insert</b> Insert	Home	<b>Prev</b> Page Up
<b>Delete</b> Delete	End	<b>Next</b> Page Down

<b>PF1</b> Num Lock	<b>PF2</b> /	<b>PF3</b> *	<b>PF4</b> -
7 Home	8 ↑	9 Pg Up	+
4 ←		6 →	
1 End		3 Pg Dn	Enter
0 Ins	2 ↓	. Del	

**INDEX**

Alternative stage sequences: .....	16	Manual Waves .....	25
Bad Plan Lines.....	18	off-line plan preparation.....	8
Complex Events.....	22	Pelican Fixed Time Plans .....	23
Copying a Plan .....	19	Pelican SCOOT Stage Translation Plans.....	24
Creating a New SCOOT Plan.....	19	Plan History.....	13
Data Preparation.....	8	Plan Line Descriptions.....	21
DBAS.....	11, 18	Plan Preparation process .....	7
Descriptive History .....	12	Range .....	13
Edit Window.....	9, 11	SCOOT .....	5
Error Window.....	9, 17	SCOOT stage translation plans .....	9
Errors.....	12	Starting the Plan Preparation Program.....	8
Fixed time plans.....	9	Suppress pedestrian phases .....	22
Gap Out.....	15, 22, 25	Test Plan.....	9
Green Wave .....	9, 13	Timetable Preparation .....	8
Green Wave Plans.....	24	TTBP.....	11
Inhibit plan compliance checks.....	22	VARY .....	15
Inhibit timings checks.....	22	View Criteria.....	12
inhibited for timings checks .....	18	View Window.....	9, 12
Intersection SCOOT Stage Translation Plans.	23	Window Management.....	10
Key Functions.....	10		