PC MILER® 31
Multi-Version Switch

User Guide

for AS400

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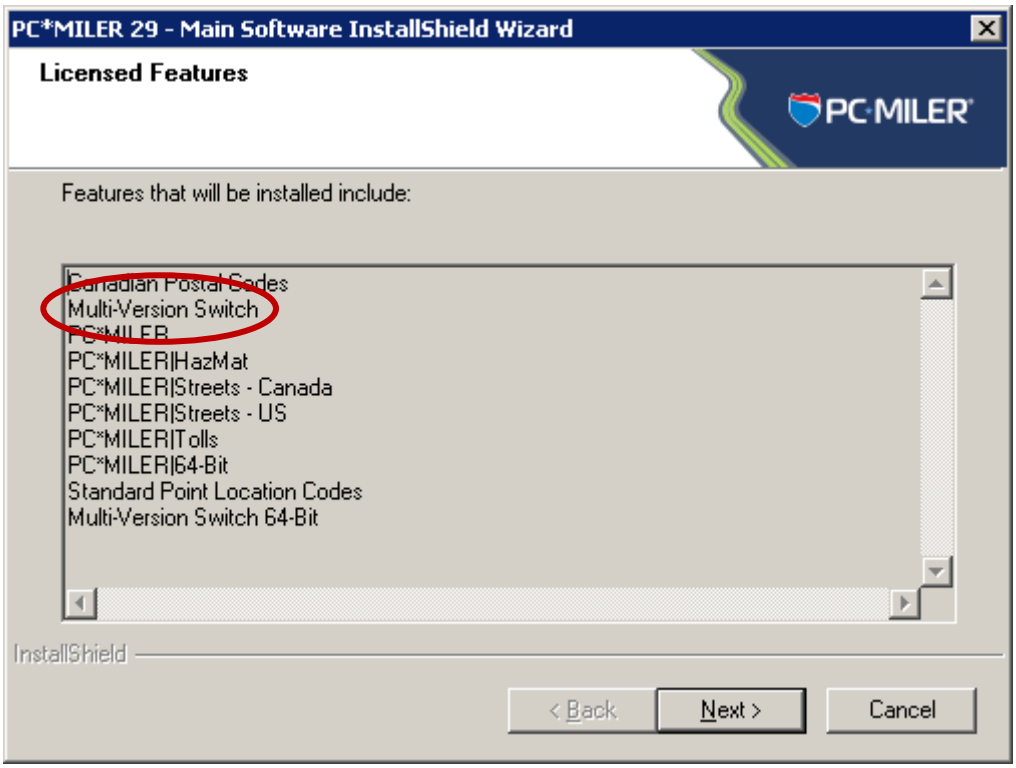
Notes and Updates – Please Read

NOTE: RouteMatrix, RouteSync, Time-Based Routing, Traffic, and Weather features are not supported in Multi-Version Switch products. Also, the API PCMSGetFmtMatch4 is currently not available for MVS (as of Version 31).

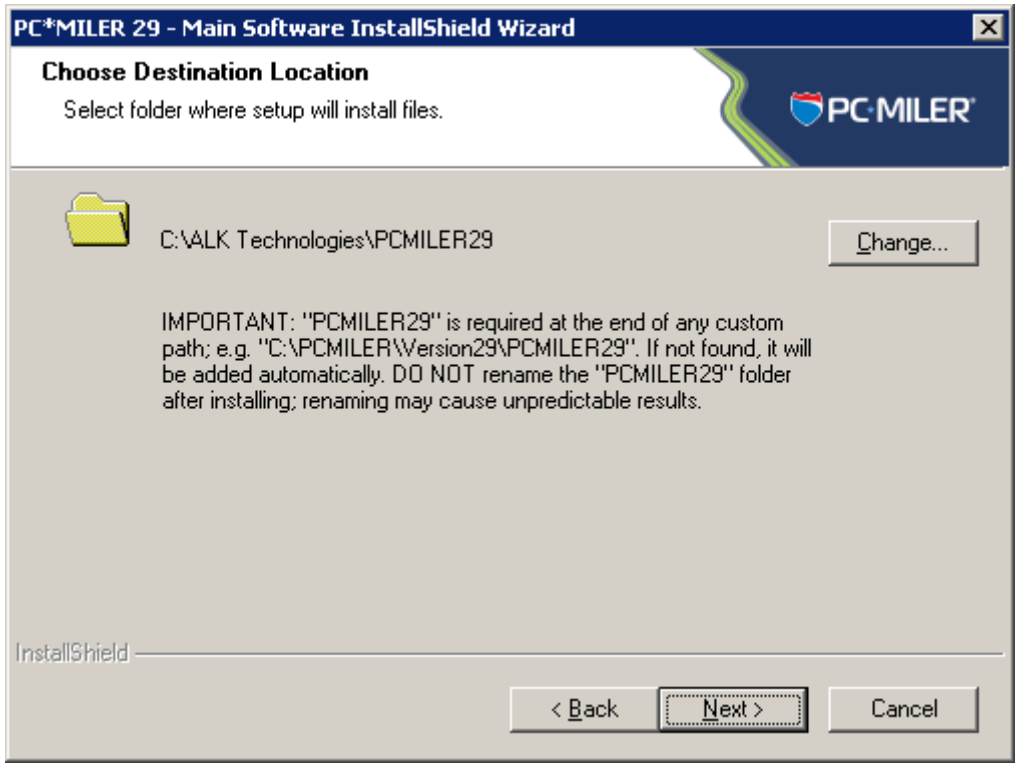
Starting with Version 27, socket software is now automatically installed. Instead of running a self-extracting zip file like V27MVS.exe to install the socket layer for your MVS, usage will be installed automatically. Be sure that your 25-digit product key code includes the MVS|Connect component as in the following example:

== PC*MILER 29 (=MVS=), Canadian Postal Codes, Tolls, Streets Canada, Streets US, Hazmat, SPLCs, MVS|Connect
39322-62349-W27QW-F24MJ-7874N

When unlocked during the installation it displays as follows:



Do not rename the PCMILERXX folder that gets created! Having 'PCMILERXX' as the parent is required (where 'XX' is the version number you are installing – '29' in the example below).



Be sure to activate your installation as prompted at the end of the install.

Notes and Updates for Version 22-31

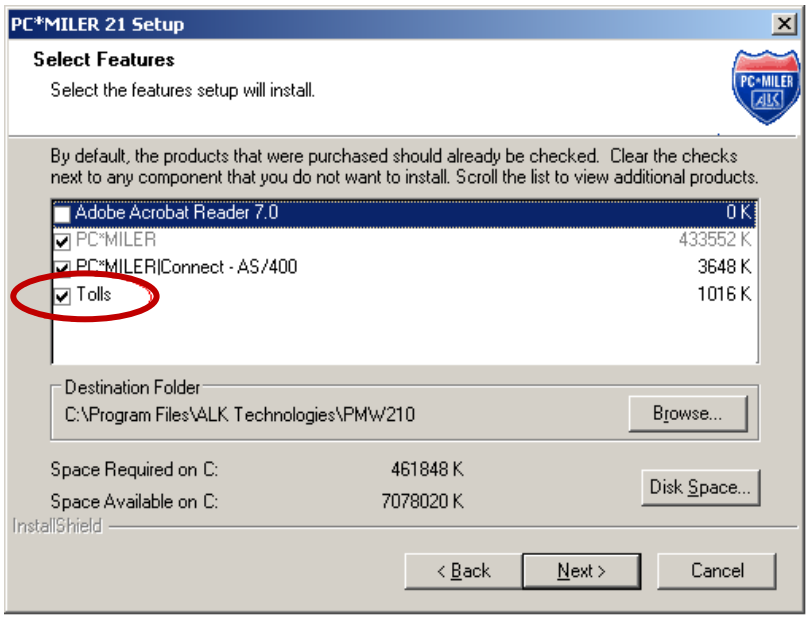
Beginning in Version 22, support has been added for PC*MILER|Worldwide versions. The PC*MILER code convention will be for the Worldwide versions to end in a capital "W".

Version 22 – 31 also include demonstration external data structures with field mappings for Borders Open/Closed and Use Ferry Distance flags. (MVSEND2 or MTSEND2). These external data structures are not used by ALK.

Notes and Updates for Version 21:

ALK has merged what was formerly the ALK|FleetSuite Tolls product into the standard PC*MILER and PC*MILER|Streets product lines. Now known as "PC*MILER|Tolls" and "PC*MILER|Streets-Tolls", each one is installed as an add-on data module and there is no longer a stand-alone product.

The PC*MILER|Tolls component is circled below as it appears during the PC Side installation of PC*MILER-AS/400.



New Naming Convention for PC*MILER|Tolls Codes:

Up until Version 20.1, there was only a .0 release of the Tolls products and the convention for the PC*MILER version code was to end Tolls product versions with a capital "T"; for example, "18T".

Then a new PC*MILER code convention was introduced: for the .0 version to end in "T" and the .1 version to end in capital "U". For example, "22T" for Tolls 22.0 and "22U" for Tolls 22.1.

Support for up to 57 versions of PC*MILER was added to the updated ALKMVS and ALKMTL libraries.

Fuel Optimization and Time-Based Routing are not supported in Multi-Version Switch products.

Version 20 Changes – Spring 2006:

On 06/10/2005 the number of Route Information segments per response packet (HR Returns) was increased from three sets to nine sets to improve performance. See section 8.2.5 for more information. ALK will provide backward compatible "Three HR Set" mileage server executables upon request. If your mileage server executable (as400.exe) is dated 01/07/2005 or older you will have to modify any third-party software packages before upgrading the as400.exe. You can add Version 20 to a Three HR Set version of as400.exe but you will not have access to the new **Borders** and **Use Ferry** options.

Version 20 offers the ability to change the Borders and Use Ferry Distance settings on a trip-by-trip basis. For packages that include the optional PC*MILER|HazMat routing add-on module, two new routing types have been added: **Caustic** and **Flammable**.

These new options are available to users of the Interactive PC*MILER and PC*MILER|Tolls programs. Third-party or in-house software packages will need to be modified to take advantage of this new functionality. See Chapter 8, *Using MVS with Other Transportation Software*, for more information.

Important Changes for Version 17 and Higher:

For Version 17 and higher, PC*MILER and PC*MILER|Tolls now offer two basic route types, **Practical** and **Shortest**, that may be combined with one or more of the other three route types that PC*MILER users are familiar with (**Toll Discouraged** and **National Network** or **53'/102" Trailer Routing**). Users of the PC*MILER or PC*MILER|Tolls interactive program who want to obtain Toll Discouraged, National Network, or 53' Trailer routing will have to specify either the Practical or Shortest route type. (Previous to Version 17, all Toll Discouraged, National Network, or 53' Trailer routes were based on the Practical route type.)

This functionality gives you the option to run 12 different route types:

- Practical
- Shortest
- Practical/Toll Discouraged
- Shortest/Toll Discouraged
- Practical//National Network
- Shortest /National Network
- Practical /53 Foot Trailer
- Shortest /53 Foot Trailer
- Practical/Toll Discouraged/National Network
- Shortest/Toll Discouraged/National Network
- Practical/Toll Discouraged/53' Trailer
- Shortest/Toll Discouraged/53' Trailer

Note that National Network and 53' Trailer Routing cannot be combined, they are mutually exclusive.

Third-Party or In-House Transportation Software Must Be Modified to Utilize PC*MILER Version 17 and Higher:

If you are using PC*MILER or PC*MILER|Tolls with other transportation software, that software will have to be modified to utilize the new functionality. Without modifications to your third-party or in-house software, you will have only the following routing types available:

- Shortest
- Practical
- Practical/Toll Discouraged
- Practical//National Network
- Practical/53' Trailer

See Chapter 8, *Using MVS with Other Transportation Software*, for more information.

Note for Users Upgrading from PC*MILER|Streets:

If you are upgrading from PC*MILER|Streets, note that the Light/Heavy vehicle option has been renamed to 'Override Restrictions'. The parameter codes have changed from L (Light) to Y (Override Restrictions) and H (Heavy) to N (Obey Restrictions). Use of L and H is still supported.

1.0 Introduction

PLEASE NOTE: In this *User's Guide*, any reference to "PC*MILER" also applies to PC*MILER|Tolls unless otherwise specified. Instructions specific to Tolls products are included.

A high-end function of PC*MILER®|Connect and PC*MILER®|Tolls-Connect, the Multi-Version Switch (MVS) serves as an integration tool designed to simultaneously support multiple versions of the product that are installed on one server or on several different servers. Replacing the need to manually query data from each individual version, the MVS functions as the main connection point to programmatically gain access to the version of choice.

MVS eliminates the need to purchase and maintain multiple PCs or servers to generate mileage calculations. It supports your bid preparation, accounting functions and customer contracts that may specify a different version of PC*MILER mileage or toll amounts generated by PC*MILER|Tolls. MVS allows you to easily price each customer's rates accurately based on their negotiated, contracted and requested version.

Product features and benefits include:

- Simultaneously support multiple versions of PC*MILER|Connect and/or PC*MILER|Tolls-Connect on a single server or desktop computer.
- Reduce the number of dedicated network servers to support along with their maintenance costs and setup fees.
- Cut labor costs by eliminating manual route entry processes.
- Ensure customers that contracts can be made and kept using their version of choice.

IMPORTANT NOTE: MVS provides connections to the most current version release and to past releases. If the intended use of the product includes generating driving directions, we strongly recommend that the newest version release is not only integrated but is the version that's accessed when requesting routing results.

The newest version release is the most up to date reflection of the current highway and street-level networks. New version releases include significant database updates that enhance the routing network with updated truck restrictions and allowances, new highways and streets, updated exit ramp structures, road alignment enhancements, and more.

The Advantage of Using Multi-Version Switch

ALK's PC*MILER products are the de-facto industry standard software solutions for determining mileage and toll costs between locations. Thousands of over-the-road carriers as well as shippers use our products as a means to determine mileage that can be agreed upon for billing purposes.

During negotiations between shipper and carrier, a particular version of PC*MILER is identified that will serve as the standard by which mileage is to be determined. Sometimes, the carrier has a certain release but the shipper wants to standardize on an older version of the product, despite the fact that ALK's support may be limited to the latest major release of the product plus one major version back. This can create an issue for the carrier because in order to support their many customers, they must support multiple versions, even some versions that are no longer supported by ALK.

To add to the issues, ALK's products are designed to replace certain access files (the DLLs) when they are installed. This means that if, for example, you have Version 26.0 on a server and then install Version 27.0 on the same server, you would overwrite the access files for v. 26.0 and would then be unable to access that version. This is a large issue for the carriers who want to integrate all versions of PC*MILER into their current Transportation Management System (TMS) for billing with one call to one server, not multiple servers.

An example of how some of our customers are currently utilizing PC*MILER|Connect is depicted below in Figure 1.1.

Figure 1.1

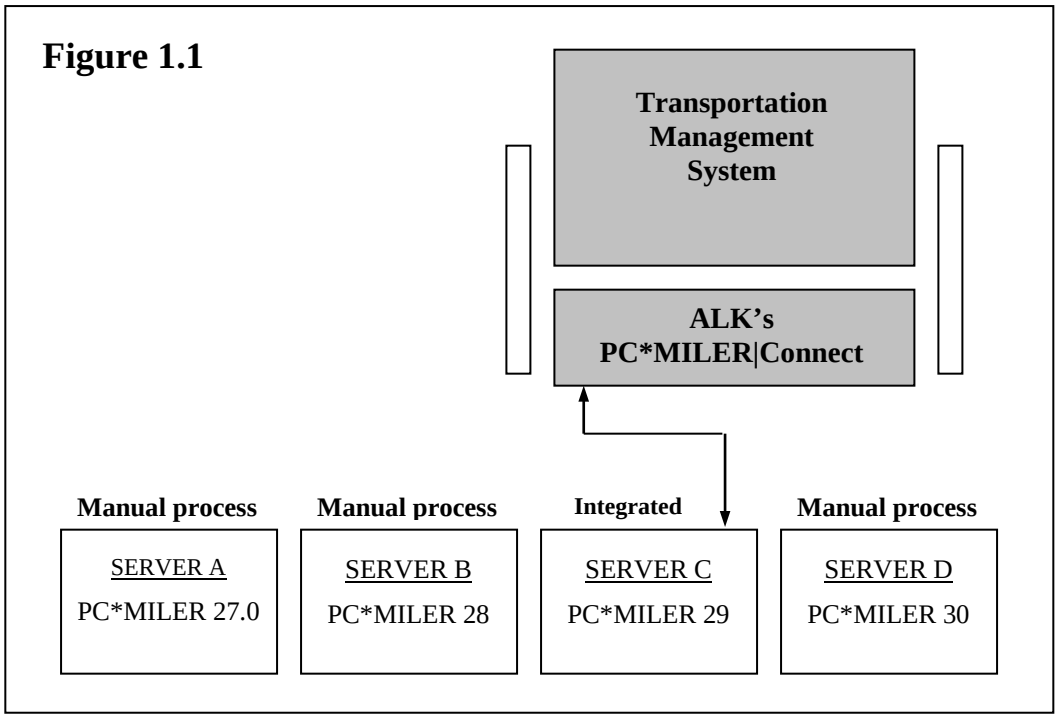


Figure 1.1 illustrates a typical PC*MILER application stack at a customer site, before installation of the MVS. There are three versions of PC*MILER which are accessed manually (through PC*MILER's Graphical User Interface) and one version integrated via PC*MILER|Connect.

To improve the business scenario above, ALK developed the MVS to allow customers to run all of the associated versions on one server, as well as have one connection point into their Transportation Management System (see Figure 1.2 below). Customers benefit operationally from the fact that all of the versions run on the same server, with the associated cost benefits of reduced hardware purchasing and decreased cost in hardware maintenance.

In addition, there is a reduction in manual PC*MILER or PC*MILER|Tolls interventions which can be excessive due to customer requirements for multiple versions. The only thing that changes in the MVS scenario is that the TMS needs to pass a parameter identifying the version the customer is utilizing. This parameter can be carried on the customer record in the database. The parameter is passed to the MVS, which then returns the data associated with that version.

Figure 1.2

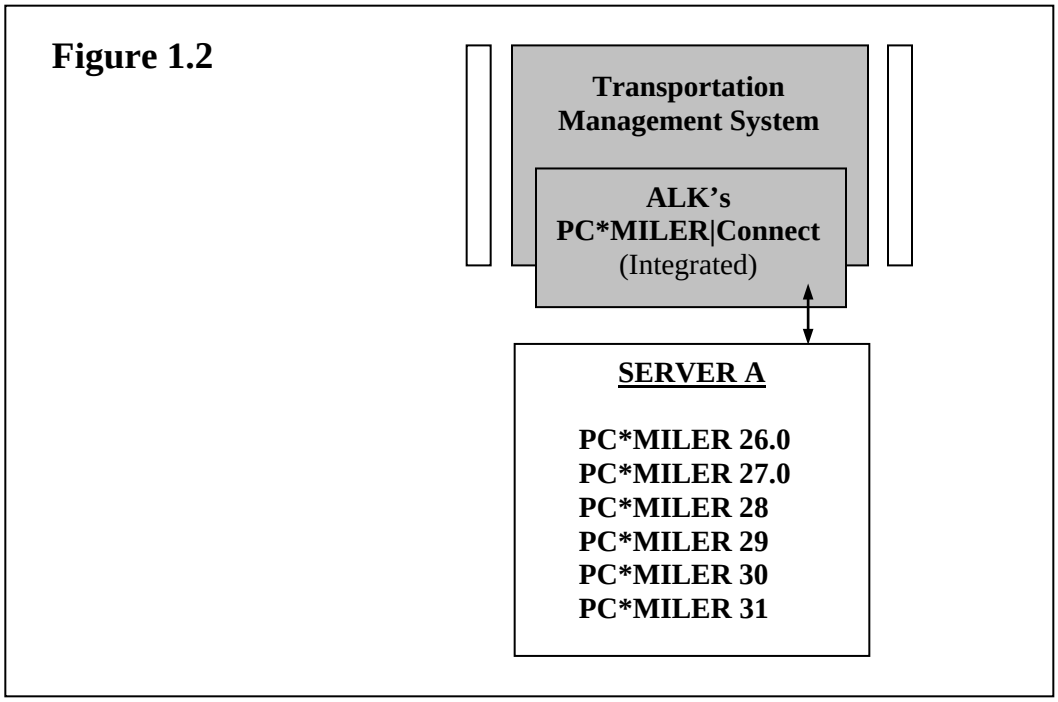


Figure 1.2 illustrates a PC*MILER application stack at a customer site, with MVS installed. There are six versions of PC*MILER, all loaded on one server and accessed by the TMS through one integration point.

The PC*MILER Multi-Version Switch currently provides connections to any version of PC*MILER|Connect, or combination of versions, listed below:

- PC*MILER|Connect 14.0 or 14.1
- PC*MILER|Connect 15.0 or 15.1
- PC*MILER|Connect 16.0 or 16.1
- PC*MILER|Connect 17.0 or 17.1
- PC*MILER|Connect 18.0 or 18.1
- PC*MILER|Connect 19.0 or 19.1
- PC*MILER|Connect 20.0 or 20.1
- PC*MILER|Connect 21.0 or 21.1
- PC*MILER|Connect 22.0 or 22.1
- PC*MILER|Connect 23.0 or 23.1
- PC*MILER|Connect 24.0 or 24.1
- PC*MILER|Connect 25.0 or 25.1
- PC*MILER|Connect 26.0 or 26.1
- PC*MILER|Connect 27.0 or 27.1
- PC*MILER|Connect 28*
- PC*MILER|Connect 29*
- PC*MILER|Connect 30*
- PC*MILER|Connect 31*

* .1 versions replaced with a DTOD Map Data update beginning with v28.

2.0 System Requirements

Because PC*MILER-AS/400 employs a Client Server solution, the following hardware and software is required. The AS/400 server uses SNA APPC data queues to communicate.

Platforms

- Windows® 7, 8 and 10* running in 32-bit compatibility mode as well as support for 64-bit native applications on Windows 7 and 8 – please see *IMPORTANT Installation Notes* below if installing connectivity products on a 64-bit machine.
  * **IMPORTANT:** Windows 10 recommended. Windows 7 requires the Convenience Rollup update.
- AS/400

NOTE: Platforms not supported include Windows Vista and XP.

Windows Requirements

Environment:

- PC with a 1.5-2 GHz processor
- 512 MB RAM (minimum), 1 GB strongly recommended

PC*MILER:

- In Version 31, automatic installation of Microsoft® .NET Framework 4.6.1 requires 4.5 GB, which reduces in size down to 39 MB once it is installed. See note in section 2.4 for exceptions.

- PC*MILER – 3.1 GB hard disk space for full install (including all Add-Ons listed below except PC*MILER|Energy, and all Connectivity products)
  - PC*MILER|Tolls – 50 MB
  - PC*MILER|Hazmat – 50 MB
  - PC*MILER|Streets (U.S. Data) – 1.3 GB
  - PC*MILER|Streets (Canadian Data) – 60 MB
  - Canadian Postal Codes – 50 MB
  - Standard Point Location Codes (SPLC) – 2 MB
  - PC*MILER|Energy – Additional 2.6 GB hard disk space

- Minimum screen resolution 800 X 600

These additional components will also be installed:

- Microsoft Visual C++ 2005 Redistributable Package (x86) – 6 MB disk space
- WindowsInstaller-KB884016-v2-x86.exe (x86) – 2 MB disk space
- .NET dotnetfx.exe (x86) – 280 MB disk space
- Microsoft® .NET Framework 4.6.1 (automatically installed with PC*MILER)

AS/400 Requirements

PC to AS/400 Connectivity Options (Not Provided by ALK)

- Netsoft's NS/Router 3.0 or higher. NS/Router 3.0 comes bundled in Client Access V3R2. *(No longer supported by ALK or Netmanage)*
- Client Access Express V4R4MO or higher, also known as iSeries Access *(recommended)*
- Supports OS/400, i5/OS and IBMi operating systems; Version 4.2 (V4R2) and higher on IBM AS/400, systemi and power Systems hardware.

IMPORTANT Installation Notes (PC*MILER Windows) – PLEASE READ

Microsoft® Windows® 10 Upgrade Recommendation: If you are on an older version of the Windows operating system, it is strongly recommended that if possible you upgrade to Windows 10 for the desktop. For users who do not regularly install the available Windows updates, upgrading to Windows 10 may save many hours or even days of installing back-logged Windows updates to allow the current version of Microsoft® .NET Framework 4.6.1 to install properly. When .NET 4.6.1 is not installed properly, PC*MILER won't open. For more on the .NET installation, please see the last note in this section.

Who Should Run PC*MILER in Administration Mode: If you're on an operating system that is stricter about permissions, such as Windows Server, please consider running PC*MILER in Administration Mode to avoid possible problems when using the application. Also, users of Microsoft® Windows® 7, 8, 10; Windows Server 2016 and Windows Server 2012 should refer to the note below.

Microsoft Windows 8 and Above: It is strongly recommended that you avoid installing to the Program Files or Program Files (x86) folder. If you need to do so, you'll have to *Run as Administrator* when you open PC*MILER.

IMPORTANT for Microsoft Windows 7 Users: You must install the Microsoft Convenience Rollup update.

Automatic Installation of Microsoft® .NET Framework 4.6.1: The PC*MILER Version 31 installation will automatically install Microsoft .NET Framework 4.6.1 if it is

not already installed. This upgrade resolves some feature display issues that occurred previously in PC*MILER for users of Windows 8.1, 10 and Server 2012 operating systems. Note that if PC*MILER is being installed from a network, the .NET installation may fail on some machines due to attributes of the installation that ALK cannot control. If this occurs, you can copy the PC*MILER installation to the local machine and install from there.

To ensure correct .NET functionality, ALK strongly encourages users to apply all available Windows Updates. Without the most recent updates, PC*MILER could fail to launch.

IMPORTANT: If the .NET Framework installation described above is performed, you must reboot when prompted to! PC*MILER won't open properly without a reboot first.

2.1 PC*MILER Graphics

PC*MILER map graphics are not supported in PC*MILER-AS/400 Multi-Version Switch.

3.0 Installation

PC*MILER for the AS/400* works by connecting a 32-bit Windows PC to your AS/400. The PC provides mileage lookups to the AS/400 via data queues. Generally, there is one common input or request queue that all users write to, with each user having their own output queue. The PC listens to the input queue for mileage request packets. Within each mileage request packet is the name of the user's output queue. The PC does a destructive read of the request packet, processes the request, and writes to the specified user's output queue.

Multiple PC*MILER versions are made available via a bundling of one or more instances of PC*MILER|TCP/IP (pcmsock.exe). AS/400 users communicate only with the PC mileage server (as400.exe). The PC mileage server handles the communication with the various instances of PC*MILER|TCP/IP. These instances can be run on a single PC or a group of PCs.

PC*MILER for the AS/400 was developed using the data queue facilities of IBM's Client Access Express. You must have this connectivity product installed and properly configured on the mileage server PC. **ALK Technologies is no longer supporting the use of the NS router as a connectivity option.**

If you have to use the NS Router, it is bundled in many releases of Client Access. For your PC*MILER for the AS/400 installation, you need only the NS Router. The NS Router must be configured to use the Anynet or Twinax protocols. Connecting via Anynet requires the creation of an Anynet Controller on the AS/400.

If you are using NS Router, you need the NS Router 3.0 or higher for PC*MILER AS/400 Version 17. Client Access 3.2 has the 3.0 Router bundled with it. **Do not patch your router without talking to ALK first. The PC*MILER for the AS/400 system was developed on a non-patched Router, and installing any patch may cause unpredictable behavior.**

*** PLEASE NOTE:** In this manual, any reference to PC*MILER also applies to PC*MILER|Tolls unless otherwise specified. Instructions specific to Tolls products are included.

3.1 Installation Overview

On the AS/400 side you will be performing a RSTLIB on your ALKMVS or ALKMTL (for Tolls) Library CD.

On the PC side, you can either install using the automated installation or the manual process. Both are covered in section 3.3, *PC Side Installation,* below. For a manual installation there is a two-step process for each version of PC*MILER that you will be installing:

- Installation of the base PC*MILER product. This installation serves as the highway network "database" for your MVS server.
- Addition of the MVS components by unzipping self-extracting Zip files.

After installing the MVS Server software via a self-extracting Zip file, you will then configure two INI files and a batch file.

NOTE: Required PC to AS/400 Connectivity Software is not provided by ALK. You need to have IBM's Client Access Express installed.

NOTE: For upgrade users adding V27, 28 or 29 to an existing MVS server, there were no updates to the ALKMVS or ALKMTL libraries so your shipment will only include the PC-side installation DVD. For V30 and higher, a fully upgraded version is needed.

3.2 AS/400 Side Installation

First install the resident AS/400 software on your AS/400. Sign on to QSECOFR or an account with equivalent authorities. Place the CD in the optical drive and follow the instructions below.

NOTE For ALKMVS Upgrades:
If your current AS400.exe is dated 1/7/2005 or older you must update your ALKMVS library. On 6/10/2005 ALK increased the number of Highway Segments per response (HS – Turn By Turn Driving Instructions) from three to nine. Failure to upgrade your current ALKMVS Library will cause the program to crash if HS requests are used.

NOTE for Updates Only: Type "mvsfig" or "mtlfig" from the AS/400 command line and Print Screen your current mileage settings. These settings will be overwritten during the library restore. After the restore of the library, re-enter these settings by running the ALKMVS/MVSFIG or ALKMTL/MTLFIG (for Tolls) command. **Make sure there are no users working in PC*MILER or PC*MILER|Streets.**

NOTE Also: If you are upgrading your ALKMVS or ALKMTL Library from an earlier version, it is recommended that you rename or clear your current ALKMVS or ALKMTL Library with the CLRLIB command.

1. Create a library with the CRTLIB command. Type **CRTLIB ALKMVS** or **ALKMTL** for Tolls.

2. Add the library to the current library list. Type **ADDLIBLE ALKMVS** or **ALKMTL** for Tolls.

For Innovative Computing Corporation installations, you will also need your ICC WORK and FILE libraries in your current library list. For Version R6, type **ADDLIBLE I93FILE** or **ITSR6FILE** and then **ADDLIBLE I93WORK** or **ITSR6WORK**. The ICC Version 7 libraries are **IESR7WORK** and **IESR7FILE**. (Call ICC if you don't know which version you are running.)

Command for restoring from CD:

rstlib savlib(ALKMVS) dev(opt01) vol(ALKMVS) Label(ALKMVS) mbropt(*all) alwobjdif(*all) rstlib(ALKMVS)

where **opt01** is your CD/DVD drive.
Make sure all objects were restored. You can ignore security warning messages. It is okay if MIDQUE does not restore because this file is created later on.

For Tolls:
rstlib savlib(ALKMTL) dev(opt01) vol(ALKMTL) Label(ALKMTL) mbropt(*all) alwobjdif(*all) rstlib(ALKMTL)

NOTE: The ALKMVS and ALKMTL Library CD were created using Kisco Information Systems' BlueCD, which allows you to create AS/400 readable SAVLIBs on a PC CD writer. A small percentage of users may have difficulty restoring the ALKMVS Library with the above command. If you experience problems:

Type **RSTLIB**, then:
Specify the library **ALKMVS** or **ALKMTL** and the appropriate optical device
b. Press **<F10>** for more options
c. Specify ***ALL** on database member options
d. Specify ***ALL** on allow object differences.

3. The system administrator should make the library **ALKMVS** or **ALKMTL** available to users at sign-on time. There are two ways to insert **ALKMVS** into the library list:

a. The WRKSYSVAL command can be used by typing **WRKSYSVAL**, and then searching for the QUSRLIBL entry. Insert ALKMVS.

b. If your users are using a job description in their user profiles, then use the CHGJOBD command (type **CHGJOBD**) and insert **ALKMVS** or **ALKMTL**.

For Innovative Computing installations, a command is available to help insert a library into the library list. ALKMVS should be the first library in the library list. (**NOTE: Run this command from a typical ICC user account or profile, not QSECOFR**.) Enter the following:

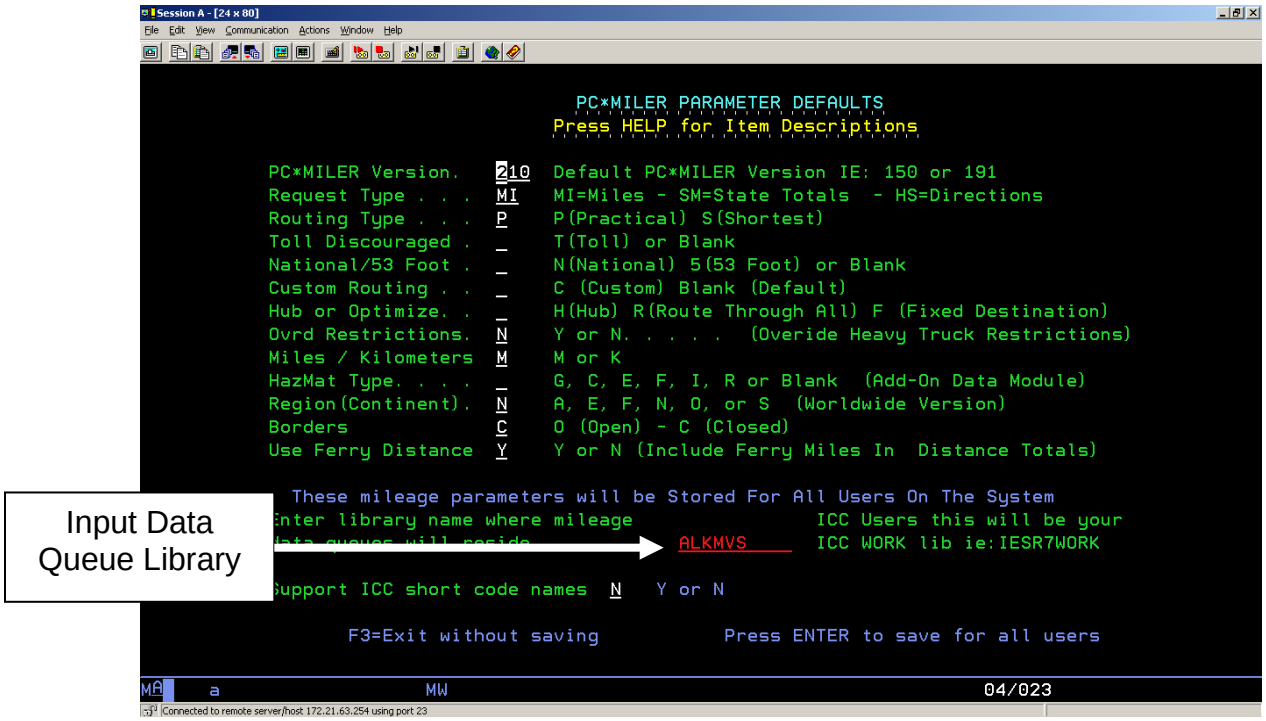
ADDLIBLE ILPGMR *LAST
CHGLIBLS
(insert) **ALKMVS** or **ALKMTL**

4. To grant object authority to library ALKMVS, enter the following:

GRTOBJAUT (press **<F4>**)
object = ***ALL**
library = **ALKMVS or ALKMTL**
objtype = ***ALL**
users = ***public**
authority = ***ALL**

NOTE: For ICC Users only (Be sure to do this!) Type the 'mvsfig' or 'mtlfig' command from the AS/400 command line after the restore of the library, then change the library for the location of mileage data queues from ALKMVS to your ICC Work library and change the ICC Support Short Code names flag from 'N' to 'Y'. Depending on the version of your ICC software, your library will be I93WORK, ITSR6WORK, or IESR7WORK. Check with ICC for this name.

NOTE Also: The AS/400 side and the PC Side must match which library the Mileage Request or input data queue resides in. You will be prompted during the PC Side Installation for your data queue location, or there is an option to change it in the mileage server window (File > AS/400 Control > Data Queue Library).



3.3 PC Side Installation

Instructions are below for 1) installing using the automated process, and 2) installing manually. When installing manually, the PC*MILER Multi-Version Switch installation is a multi-faceted process. The installation varies depending on the number of versions of PC*MILER and PC*MILER|Streets involved and the number of mileage server PCs that will be used.

Multiple PC*MILER versions are made available via a bundling of one or more instances of PC*MILER|TCP/IP (pcmsock.exe). PC*MILER Multi-Version Switch users communicate only with a special version of the PC*MILER|Connect DLL that handles the communication with the various instances of PC*MILER|TCP/IP. These instances can be run on a single PC or on a group of PCs.

The installation and operation of the product is made easier if you use one quality desktop PC dedicated to running only the Multi-Version Switch. Configuration time is minimized this way and the product can be launched automatically.

For multiple PC installations, the increase in network traffic is minimal for mileage requests: less than 0.3KB per request and generally no larger than 35KB for turn-by-turn Driving Directions.

Essentially the PC*MILER Multi-Version Switch installation can be broken down into two parts:

1) The Multi-Version Switch (pcmmv.dll) which is linked to the client software, and
2) At least one instance of PC*MILER|TCP/IP (pcmsock.exe) which provides the mileage and routing information for pcmmv.dll to return to the calling program.

Each instance of PC*MILER|TCP/IP needs its own copy of the PC*MILER desktop application. This installation provides the highway network database and a mechanism for editing custom routing features.

PC*MILER|TCP/IP is itself built on another PC*MILER product – PC*MILER|Connect – ALK's mileage and routing dynamic link library (DLL).

PC*MILER|Connect is a version-specific product. For example, Connect Version 22.x will not work with Version 23 PC*MILER. The normal installation of PC*MILER|Connect involves installation of our mileage and routing DLLs to a computer's \Windows folder. For the Multi-Version Switch, these DLLs are installed to the working directory for pcmsock.exe, underneath the top level of that version's PC*MILER for Windows installation.

For example, for a standard installation of PC*MILER|Connect Version 26 you will find pcmsrv32.dll in C:\Windows. For an MVS installation, pcmsrv32.dll will be in C:\ALK Technologies\Pmw260\Tcpip. Starting with V28 the folder naming convention changed from 'PmwXXX'\Tcpip' to PCMILER2X\MVS. Upon installing the optional DTOD Map Data Update (formerly the .1 release) you will get a second subfolder 'MVSDTOD'. This second folder allows you to run both the general and DTOD complaint releases easily on the same MVS Server PC.

3.3.1 PC Side Automated Installation Instructions

Below are the steps for installing PC*MILER MVS if you are using the automated installation process. It only needs to be done once. All versions for which the user is licensed will be installed. The automated process is currently available for versions 26 – 31 to new users of MVS and for those who are adding one or more versions to an existing MVS installation.

1. Download Multi-Version Switch using the link provided in the email you received from ALK when the product was purchased.

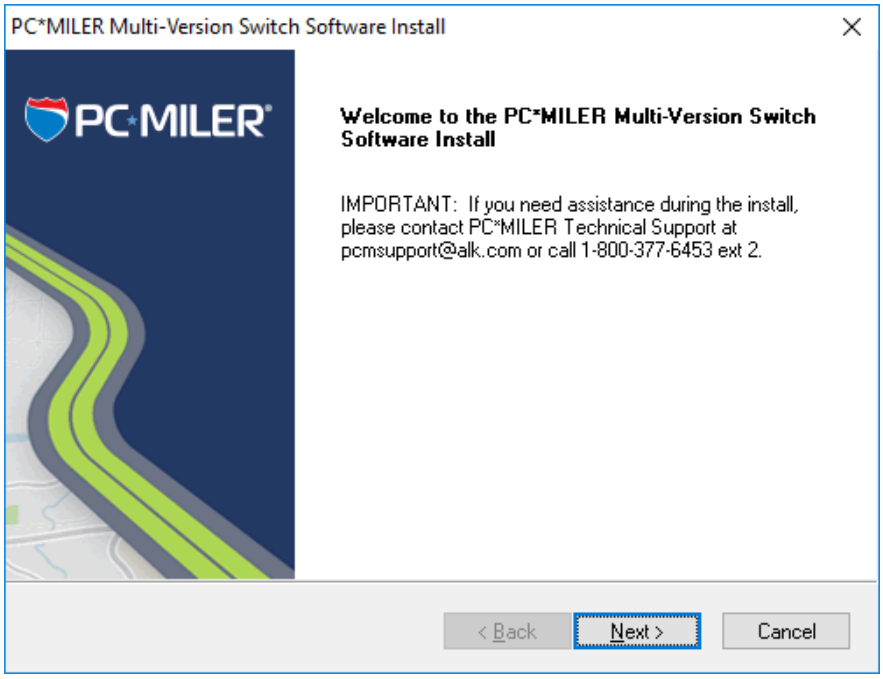
2. Run the setup.exe, which will create and install files to one of the following folders:

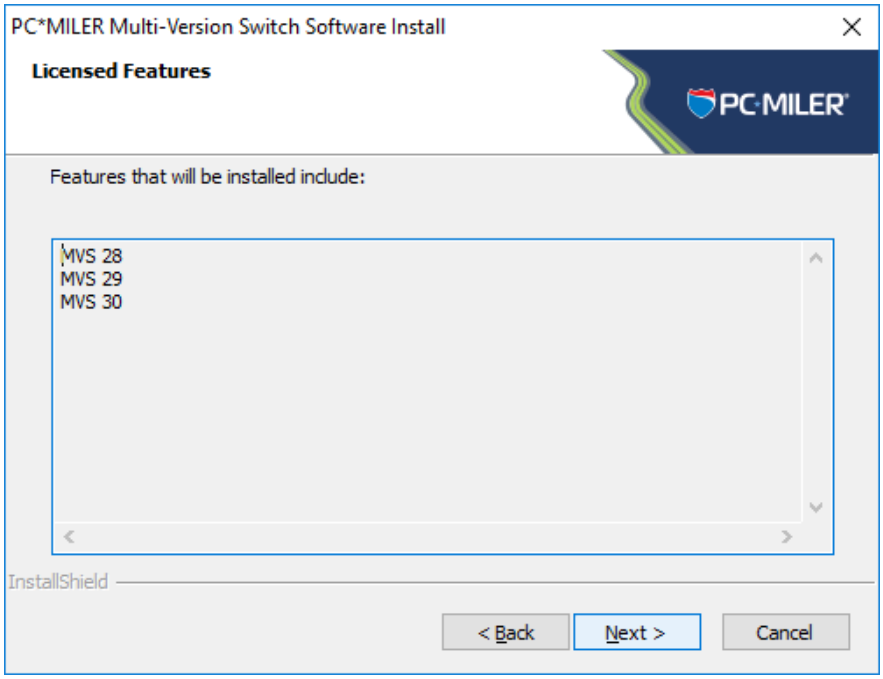
C:\ALK Technologies\ALKMVS

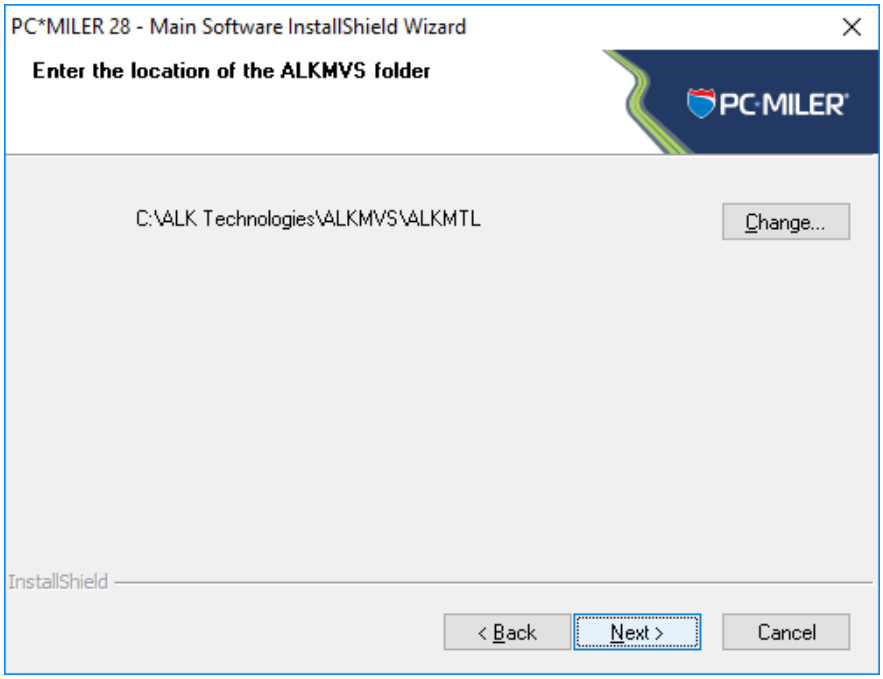
or

C:\ALK Technologies\ALKMVS\ALKMTL (for AS400 installs)

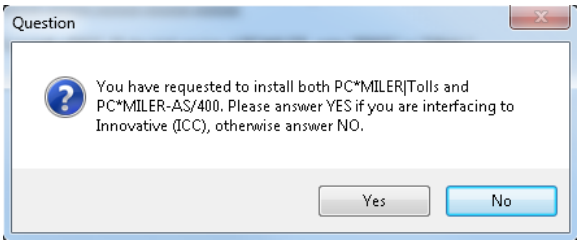
Following is a sampling of how the install screens might look (not a step-by-step illustration):







If you purchased the PC*MILER|Tolls component you will get this prompt:



Answering '**Yes**' will turn off the Tolls component and install an ICC-compatible version of PC*MILER.

Answering '**No**' will install the PC*MILER|Tolls version of PC*MILER. (ICC users and users of third-party or custom in-house transportation software should click 'Yes'.)

3.3.2 PC Side Manual Installation – Overview

Section 3.3.3 below provides step-by-step installation instructions for manually installing. There is a two-step process for each version of PC*MILER that you will be installing manually.

- Installation of the base PC*MILER product. This installation serves as the highway network "database" for your MVS server.
- Addition of the MVS components by unzipping self-extracting zip files.

After installing the MVS Server software via a self-extracting zip file, you will then configure an INI and a batch file.

NOTE: Before Version 16, SPLC's and CanPosts were mutually exclusive; you could install one or the other. In Version 16 and higher, both can be installed together.

IMPORTANT: You cannot have the ".0" and the ".1" release of version 14 or 15 on the same PC because they share a common Registry Key. For example, if you need access to versions 14.0 and 14.1 you will need to install 14.0 on one PC and 14.1 on a second PC. For Version 16 and higher it is possible to run both the .0 and .1 releases on the same PC. Doing so does complicate the installation. See *Appendix C* for more information.

For installing PC*MILER|Streets Versions 16.0 to Version 23.0, you will need to browse to the Street Level Data CD folders on your MVS DVDs. The naming convention is <MVS_DVD>\Vxxx_StreetsCD where xxx is the version number. If the setup.exe fails to find the StreetsCD you can share the Vxxx_StreetsCD

folder and map a drive to it or burn a CD of the contents of the <MVS_DVD>\VxxxStreetsCD. The files and folder have to be on the CDs root level

For Versions 26.1 and 27.1, optional WorldWide Streets data is available that ships on a second DVD. North American Streets Data does not ship on a separate DVD. Installation of North American Streets Data is controlled by your 25-digit product key code.

Starting with Version 28 links to download optional data set installers will be provided instead of DVDs. Optional data sets include:

DTOD Data
Worldwide Highway Data
Engery Data
Streets Africa
Streets Asia
Streets Europe
Streets Middle East
Streets Oceania
Streets South America

PC*MILER versions 22.0 and 22.1 have a separate Points of Interest CD located in <MVS_DVD>\V22_POI_CD. Note: It is not possible to skip the POI portion of the installation.

Install time Product Key Codes are provided on each MVS installation disk, <MVS_DVD>\MVSInst\install_codes.txt. for your initial MVS order and then in <MVS_DVD>\MVSInst\Directions.txt or VarsityDirections.txt for subsequent releases.

If prompted for an '**Installation Type**' always choose '**Single PC – Typical**'.

For Version 16.0 to 26.1, skip the prompts to 'Activate the License' that typically occur at the end of the installations unless you are directed to activate your installation in your install_codes.txt or directions.txt file. Starting with V27.0 you must activate your installation as prompted at the end of the install.

Once the various PC*MILER|TCP/IP installations are complete, install the Multi-Version Switch software.

You can install all versions of PC*MILER on one PC, or you can install each version on its own PC (the PCs must be networked). See note below.

3.3.3 Step-by-Step Manual Installation Instructions

1) A typical MVS Installation CD will be similar to the following:

<Dir> MVSInst
<Dir> V270
<Dir> V28
<Dir> V29
<Dir> V30
<Dir> V31

\MVSInst contains Install_Codes.txt. and ALKMVS.exe. ALKMVS.exe is a self-extracting zip file that holds the MVS portion of the install.

Sample with Streets CDs (older versions):
<Dir> MVSInst
<Dir> V220
<Dir> V230
<Dir> V240
<Dir> V220_StreetsCD
<Dir> V230_StreetsCD
<Dir> V22_POI_CD

NOTE: The name for 'ALKMVS.exe' can vary depending on the products ordered. The files will always include 'ALK' and be descriptively named.

The Vxxx folders contain the installations for the desktop PC*MILER programs that are required. You will be running the setup.exes in these folders and filling in the required product key codes from <MVS_DVD>\MVSInst\Install_Codes.txt or Directions.txt on Update Disks. \MVSInst contains Install_Codes.txt, each version's PC*MILER|TCP/IP software and ALKMVS.exe. ALKMVS.exe is a self-extracting zip file that holds the MVS portion of the install.

2) Install the correct version of PC*MILER|TCP/IP for each version of PC*MILER that you will be using. **Pay strict attention to which version you are installing.**

NOTE: When installing 16.0 and 16.1 or 17.0 and 17.1 on the same PC, running the incorrect self-extracting zip file will result in errors because they have the same 'Unzip to' location setting.

Sample MVSInst Folder:
alkmvs.exe <= MVS Software
Install_Codes.txt <= Install time key codes and order specific instructions
V161MVS.exe <=Version specific MVS socket layer software

V171MVS.exe
V18MVS.exe
V19MVS.exe
V20MVS.exe
V21MVS.exe
V22MVS.exe
V23MVS.exe
V23MVSx86.exe
V24MVS.exe
V24MVSx86.exe
<DIR> UserGuide <= User's Guides
<DIR> VCPatch <= Microsoft compatibility patches for V22 and V23
<DIR> InstallerScreenshots <= Screenshots of new for V28 installers

On 64 Bit PCs, V23 and V24 the default installation location will be below C:\Program Files (x86). V23MVSX86.exe, V24MVSx86.exe, and V241MVSx86.exe are intended for use when installing to C:\Program Files (x86).

NOTE: Starting with Version 28, you are required to have PCMILERXX as the parent directory for your base PC*MILER installation. Do not rename the PCMILERXX folder that gets created during the install. For example, V28 will install to a PCMILER28 folder, you cannot rename the folder or choose to have V28 installed to PMW280 by the setup.exe.

3) Install the PC*MILER Multi-Version Switch by following the steps below.

Step 1:

Insert the PC*MILER Multiple-Version Switch Windows Install CD. Here are the folders on a hypothetical CD:

MVSInst
V241
V251
V261
V271

Step 1.1

Open <MVS DVD>\MVSInst\Install_Codes.txt to obtain your installation codes:

- Run <MVS DVD>\Vxxx\setup.exe

NOTE: It is recommended that you always use the default locations for the PC*MILER installations. If you use non-default locations you will have to redirect self-extracting zip files later in the installations, in addition to adjusting your configuration files. If you have to install to a drive other than C:\, just changing the drive letter in the installation path greatly simplifies installation and maintenance. For example, install V29 to D:\ALK Technologies\PCMILER29 instead of the default C:\ALK Technologies\PCMILER29.

If prompted, choose 'Single PC Typical' for your installation type.

For Versions 16.0 to 26.1 ignore prompts to 'Activate' your license, unless you are directed to activate your license in your install_codes.txt file.

All installations of Version 27.0 and higher must be activated as prompted at the end of the installation.

Step 2:

Install the Multi-Version Switch Software:

On the Multi-Version Switch Install DVD is a folder called 'MVSInst'. Within the folder are the following self-extracting zip files (the MVSInst folders are identical across your set of installation discs). Alkmvs.exe (or similar) → Contains Multi-Version Switch Software and Support Files.

Each version of a PC*MILER product will have self-extracting zip files that contain version-specific MVS software:

Version 14
V14MVS.exe - Use with either V14.0 or V14.1

Version 15
V15MVS.exe - Use with either V15.0 or V15.1

Version 16
V160MVS.exe - Use only with V16.0
V161MVS.exe - Use only with V16.1
V161cMVS.exe - Use only with V16.1 installed to a 'PMW161' folder

Version 17
V170MVS.exe - Use only with V17.0
V171MVS.exe - Use only with V17.1
V171cMVS.exe - Use only with V17.1 installed to a 'PMW171' folder
WW17MVS.exe - Use only with V17 Worldwide Edition

Version 18
V18MVS.exe - Use with either V18.0 or V18.1
V181cMVS.exe - Use only with V18.1 installed to a 'PMW181' folder
Tolls18MVS.exe - Use only with ALK|FleetSuite Tolls V18
WW18MVS.exe - Use only with V18 Worldwide Edition

Version 19
V19MVS.exe - Use with either V19.0 or V19.1
V191cMVS.exe - Use only with V19.1 installed to a 'PMW191' folder
Tolls19MVS.exe - Use only with ALK|FleetSuite Tolls V19
WW19MVS.exe - Use only with V19 Worldwide Edition

Version 20
V20MVS.exe - Use with either V20.0 or V20.1
V201cMVS.exe - Use only with V20.1 installed to a 'PMW201' folder
Tolls20MVS.exe - Use only with ALK|FleetSuite Tolls V20
Tolls201cMVS.exe - Use only with ALK|FleetSuite Tolls V20.1 installed to a 'TOLLS201' folder
WW20MVS.exe - Use only with V20 Worldwide Edition

Version 21
V21MVS.exe - Use with either V21.0 or V21.1
V211cMVS.exe - Use only with V21.1 installed to a 'PMW211' folder
WW21MVS.exe - Use only with V21 Worldwide Edition

Version 22
V22MVS.exe - Use with either V22.0 or V22.1
V221cMVS.exe - Use only with V22.1 installed to a 'PMW221' folder
WW22MVS.exe - Use only with V22 Worldwide Edition

Version 23
V23MVS.exe - Use with either V23.0 or V23.1 on a 32 bit PC
V23MVSx86.exe - Use with either V23.0 or V23.1 on a 64 bit PC
V231cMVS.exe - Use only with V23.1 installed to a 'PMW231' folder
WW23MVS.exe - Use only with V23 Worldwide Edition

Version 24
V24MVS.exe - Use only with V24.0 on a 32 Bit PC
V24MVSx86.exe - Use only with V24.0 on a 64 Bit PC
V241MVS.exe - Use only with V24.1 on a 32 Bit PC
V241MVSx86.exe - Use only with V24.1 on a 64 Bit PC

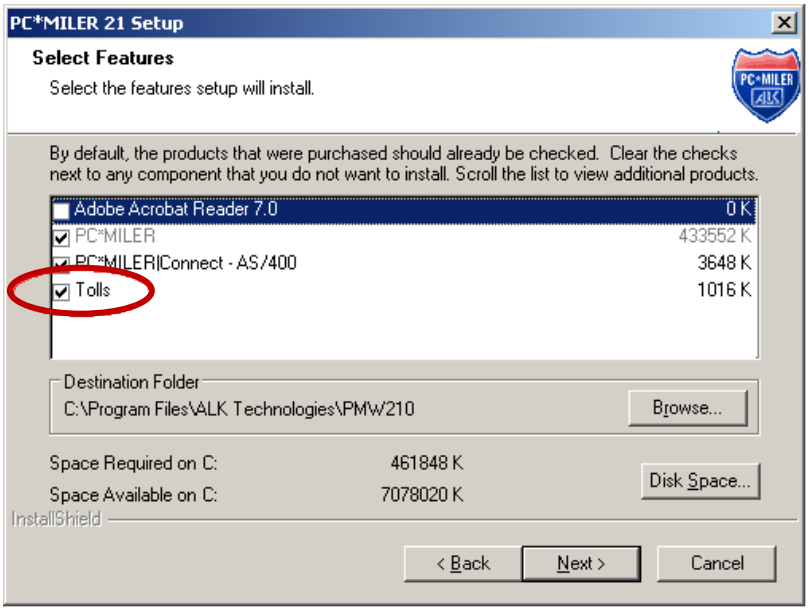
Version 25
V25MVS.exe - Use only with V25.0
V251MVS.exe - Use only with V25.1

Version 26
V26MVS.exe - Use only with V26.0
V261MVS.exe - Use only with V26.1

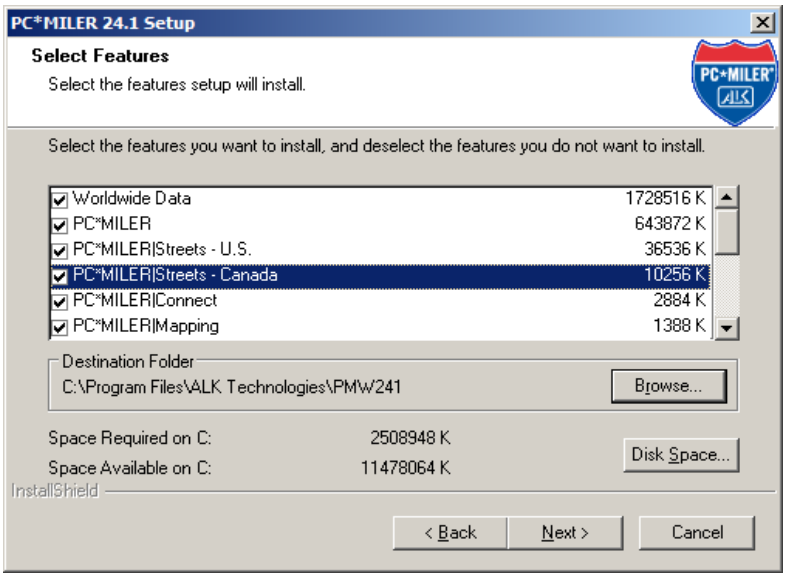
Version 27
V27MVS.exe - Use only with V27.0
V271MVS.exe - Use only with V27.1

Version 28 and higher
There is only one version of PC*MILER.

NOTE: Starting with Version 21 ALK|FleetSuite Tolls has been merged into the standard Highway product as "PC*MILER|Tolls" and is now installed as an optional data add-on component as pictured below.



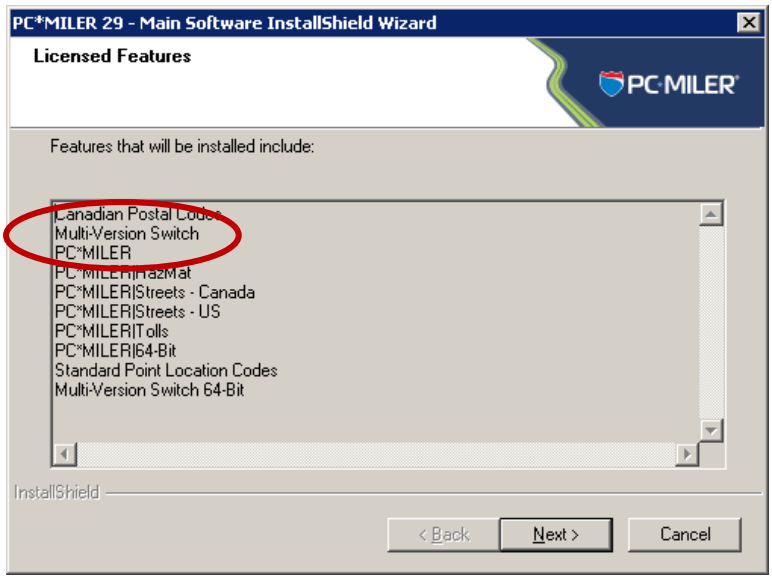
NOTE: Starting with Version 24.1 the Worldwide product was merged into the standard .1 release and is installed as a data add-on as pictured below. Beginning with Version 28, the .1 release of PC*MILER has been discontinued.



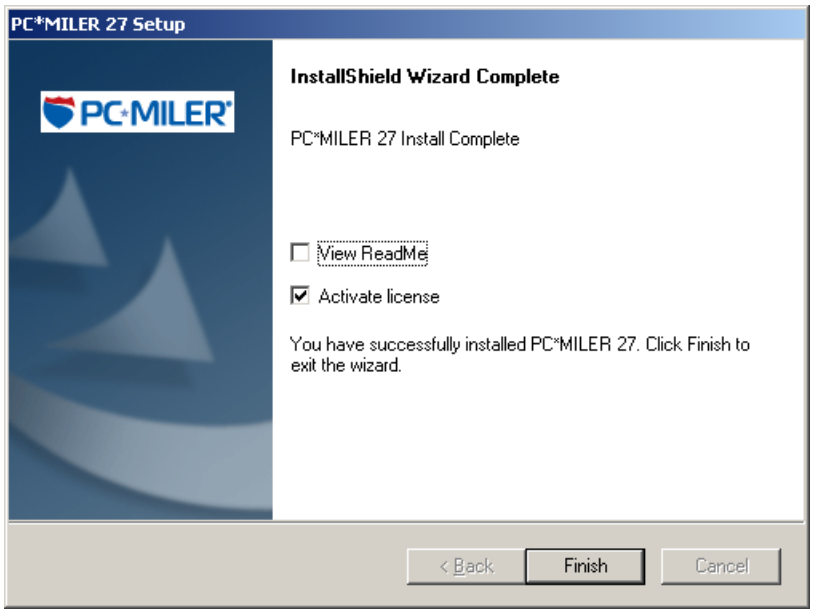
NOTE: Starting with Version 28, the software that had been installed via a self-extracting zip file is now installed automatically by the setup.exe. Be sure that your 25-digit product key code includes the new MVS|Connect component as below.

== PC*MILER 29, (=MVS=), Canadian Postal Codes, Tolls, Streets Canada, Streets US, Hazmat, SPLCs, MVS|Connect
39322-62349-W27QW-F24MJ-7874N

When unlocked during the v29 installation it displays as follows:



For Version 27 and higher, be sure to activate your installation as prompted at the end of the install. Some orders may include options in Versions 26 and less that also have to be activated. This requirement will be documented in your install_codes.txt file or directions.txt file.



Step 2.1

Run alkmvs.exe (or similar).

This is a self-extracting zip file that is set to unzip to C:\ALK Technologies\ALKMVS. Alkmvs.exe contains:

Pcmmv.dll
Pcmmv.ini
Startmvs.bat
Killmvs.bat
Delay.exe
Process.exe
Putty.exe
MVTest.exe (Usage: MVTest <space> all)

Delay.exe is a shareware utility for adding delay periods to Startmvs.bat. Delays between starting the various instances of pcmsock.exe are necessary on some systems.

Process.exe is a shareware process utility called from Killmvs.bat, useful in closing the instances of pcmsock.exe.

Putty.exe is a shareware Telnet client that can be used to test connectivity to the pcmsockxx.exe layer.

MVS is architected so that pcmmv.dll and pcmmv.ini must reside in the same directory with their calling application.

TMW users must copy pcmmv.ini, pcmmv.dll, and mvtest.exe to C:\Windows.

Each user may need their own copies of Pcmmv.dll and Pcmmv.ini. Typically you will only have one instance of Startmvs.bat.

NOTE: With multiple copies of Pcmmv.dll and Pcmmv.ini you will have to edit Pcmmv.dll to point to your MVS Server.

For example, change 127.0.0.1 to the IP address of your MVS Server.

Pcmmv.ini Before:

Key Names Must Match the calls being made from pcmmv.dll's PCMSOpenServer2() function (CaSE SEnsiTiVe).

```
[PCMiler 270]
address=127.0.0.1
port=8270

[PCMiler 280]
address=127.0.0.1
port=8280

[PCMiler 290]
address=127.0.0.1
port=8290

[default]
product=PCMiler 290
```

Pcmmv.ini After:

```
[PCMiler 270]
address=123.456.789.012
port=8270

[PCMiler 280]
address=123.456.789.012
port=8280
```

```
[PCMiler 290]
address=123.456.789.012
port=8290
```

Step 2.2

For Versions 16.0 to 27.1, unzip the correct version of the MVS self-extracting zip file for your version. The self-extracting zip files are set to unzip to the default locations.

If you installed your PC*MILER to non-default locations, you will have to redirect the extractions in the winzip windows. If you redirect the extractions, be sure that you are redirecting to the top level of the PC*MILER installation. The top level of the installation is marked by the presence of an 'NA' subfolder or a 'World' subfolder for WorldWide versions and releases starting with V24.1. For non-default installations of Version 16.0 and higher you will also have to adjust the DllPath=Value in ..\Pmw1xx\TcpIp\pcmserve.ini. For example:

The default setting for DLLPath is:
DLLPath=C:\Program Files\ALK Technologies\PMW290\app

With the value adjusted for a non-default installation to D:\ drive, this line reads:
DLLPath=D:\Program Files\ALK Technologies\PMW290\app

Be sure to run the correct self-extracting zip file for your specific .0, .1, Tolls or Worldwide release:

Version 14
V14MVS.exe - Use with either V14.0 or V14.1

Version 15
V15MVS.exe - Use with either V15.0 or V15.1

Version 16
V160MVS.exe - Use only with V16.0
V161MVS.exe - Use only with V16.1
V161cMVS.exe - Use only with V16.1 installed to a 'PMW161' folder

Version 17
V170MVS.exe - Use only with V17.0
V171MVS.exe - Use only with V17.1
V171cMVS.exe - Use only with V17.1 installed to a 'PMW171' folder
WW17MVS.exe - Use only with V17 Worldwide Edition

Version 18
V18MVS.exe - Use with either V18.0 or V18.1
V181cMVS.exe - Use only with V18.1 installed to a 'PMW181' folder

Tolls18MVS.exe - Use only with ALK|FleetSuite Tolls V18
WW18MVS.exe - Use only with V18 Worldwide Edition

Version 19
V19MVS.exe - Use with either V19.0 or V19.1
V191cMVS.exe - Use only with V19.1 installed to a 'PMW191' folder
Tolls19MVS.exe - Use only with ALK|FleetSuite Tolls V19
WW19MVS.exe - Use only with V19 Worldwide Edition

Version 20
V20MVS.exe - Use with either V20.0 or V20.1
V201cMVS.exe - Use only with V20.1 installed to a 'PMW201' folder
Tolls20MVS.exe - Use only with ALK|FleetSuite Tolls V20
Tolls201cMVS.exe - Use only with ALK|FleetSuite Tolls V20.1 installed to a 'TOLLS201' folder
WW20MVS.exe - Use only with V20 Worldwide Edition

Version 21
V21MVS.exe - Use with either V21.0 or V21.1
V211cMVS.exe - Use only with V21.1 installed to a 'PMW211' folder
WW21MVS.exe - Use only with V21 Worldwide Edition

Version 22
V22MVS.exe - Use with either V22.0 or V22.1
V221cMVS.exe - Use only with V22.1 installed to a 'PMW221' folder
WW22MVS.exe - Use only with V22 Worldwide Edition

Version 23
V23MVS.exe - Use with either V23.0 or V23.1 on a 32 bit PC
V23MVSx86.exe - Use with either V23.0 or V23.1 on a 64 bit PC
V231cMVS.exe - Use only with V23.1 installed to a 'PMW231' folder
WW23MVS.exe - Use only with V23 Worldwide Edition

Version 24
V24MVS.exe - Use only with V24.0 on a 32 Bit PC
V24MVSx86.exe - Use only with V24.0 on a 64 Bit PC
V241MVS.exe - Use only with V24.1 on a 32 Bit PC
V241MVSx86.exe - Use only with V24.1 on a 64 Bit PC

Version 25
V25MVS.exe - Use only with V25.0
V251MVS.exe - Use only with V25.1

Version 26
V26MVS.exe - Use only with V26.0
V261MVS.exe - Use only with V26.1

Version 27
V27MVS.exe - Use only with V27.0
V271MVS.exe - Use only with V27.1

Version 28 and higher
There is only one version of PC*MILER.

Step 3: Configuring PC*MILER|Connect MVS

Step 3.1: Edit pcmmv.ini to set default PC*MILER Version

Set the default version of PC*MILER under the Default Key. Mileage will only be returned if the PC*MILER version trip parameter is valid. The default name must match one of the key names. You must maintain case sensitivity when editing pcmmv.ini.

The format for the Section values is PCMiler<space>XXX where XXX is the version number.

For example, a **correct entry** for V24.1 from a pcmmv.ini:

[PCMiler 241]
address=127.0.0.1
port=8241

Incorrect entries that could lead to failures:

[PCMiler24] or [pcmiler 241]

Step 3.2: Edit Pcmmv.ini to point to your various instances of PC*MILER|TC/PIP Connect

If you are going to run each instance of PC*MILER|TCP/IP on a single PC, you can skip this step.

Pcmmv.ini is used to locate the various instances of PC*MILER|TCP/IP. By default, Pcmmv.ini is pointing to local copies via the loop back address. If you are using multiple PCs you will have to change the loop back (127.0.0.1) to the IP address or the computer name of the remote PC. If you are having trouble connecting on a computer name, you will have to map that computer's name to its IP address in:

C:\windows\system32\drivers\etc\hosts.

If your system has a conflict with the default port number, you will have to change the port number in pcmmv.ini and in the batch file that is used to start up PC*MILER|TCP/IP. Port conflicts are indicated by 'Bind Failed' errors when starting an instance of pcmsock.exe.

The convention for Port Number Assignment is for PC*MILER and PC*MILER|Streets versions to use the 8000 range with the last three digits being the version number. For example: For V21.0 the default port is 8210. With both V21.0 and V21.1 installed, the default Ports would be 8210 for V21.0 and 8211 for V21.1.

If you are installing the same version of both ALK FleetSuite|Tolls and PC*MILER, use the 9000 range for the Tolls installs.

NOTE: Use of an easy-to-remember convention makes troubleshooting and maintaining installations easier.

For client server installations you will need to replace the loopback addresses with the IP address of the server. You can determine the IP address with the DOS 'IPCONFIG' command. To 'install' MVS on your client PC you will be copying an edited pcmmv.ini plus pcmmv.dll and mvtest.exe to your workstations. These copies will be in made in C:\Windows or the working directory of the calling application.

Step 3.3.

The various instances of PC*MILER|TC/PIP Connect need to be started before starting the Multi-Version Switch executable. The best way to do this is via a batch file. A working copy of one is included, called StartMvs.bat, that is in the self-extracting zip file (see Step 2.1 above).

Creating a desktop icon for Startmvs.bat can be very helpful. For automatic startups, create a shortcut in the Startup Folder.

NOTES:

- Each version of pcmsock.exe has been renamed with its version number appended so that the versions are distinguishable in the Windows Task Manager.
- The second parameter passed to pcmsockxx.exe is the Port Number. If you change these values you must change the values in pcmmv.ini.
- If you have non-default location installations of PC*MILER, you will have to adjust startmvs.bat accordingly.
- If you have non-default location installations of PC*MILER 16 to 31, you will have to adjust the DLLPath= values in the ..\TcpIp\pcmserve.ini.

4.0 Starting an Instance of PC*MILER|TCP/IP

PC*MILER|TCP/IP can be started from a command or from a batch file. Within the PC*MILER-AS/400 Multi-Version Switch installation, each copy of PC*MILER|TCP/IP (pcmsock.exe) has been renamed to reflect the PC*MILER version it is returning mileage and routing information for. The format is pcmsockxx.exe where xx is the PC*MILER version. This enables identification of a particular version within the Windows Task Manager.

Pcmsock.exe takes two parameters, the PC*MILER package, and the port number.

The PC*MILER package is **PC_MILER.** You should use Ports in the 8000 range, with the last three digits corresponding to the version of PC*MILER that is being used. So for V21.0, for example, the default port is 8210. With both V21.0 and V21.1 installed, the default Ports would be 8210 for V21.0 and 8211 for V21.1.

If you are installing the same version of both ALK FleetSuite|Tolls and PC*MILER, use the 9000 range for the Tolls installs.

Use of easy-to-remember conventions makes troubleshooting and maintaining installations easier.

There are no hard rules for port assignments. You do need strict agreement between the port number in Pcmmv.ini and the port number that the particular version of pcmsock.exe was started with.

For example:

Pcmsock20.exe<space>**PC_MILER**<space>**8200**

would be the command to start Version 20 PC*MILER|TCP/IP.

It is best to use a batch file to start the various services. Within the batch file you must change directories to the installation directory of PC*MILER|TCP/IP before launching the start command.

NOTE: If you are using a multiple PC setup, you will need to have a batch file on each PC.

5.0 Troubleshooting

After starting the various instances of pcmsock.exe, you can test them from a Command prompt. Type:

C: <Enter>
CD \"ALK Technologies"\ALKMVS <Enter>
Mvtest<space>all <Enter>

If a particular version is failing, each PC*MILER version Tcpip subdirectory contains pcmstest.exe, which will test the PC*MILER|Connect (pcmsrv32.dll) level of the installation.

If you get an error running pcmstest.exe, it is commonly a configuration issue with the DLLPath value in that version's pcmserve.ini file.

If the DLLPath value is valid you should then run the desktop program (pcmwin32.exe or alk.pcmiler.exe for V27 or higher) for that version to rule out a problem with the PC*MILER Highway/Street Level databases. If pcmwin32.exe or alk.pcmiler.exe errors occur, you will have to uninstall and reinstall that version of PC*MILER.
You can also use Telnet or putty.exe to test an instance of pcmsock.exe to rule out a problem at the pcmmv.dll level:

Start=>Run=>Telnet
O<space>loopback<space>port#

You should get 'ALK Server Ready' back.

Enter:

Pcmscalcdistance(10001,90009)

You should get roughly 2800 miles back.

There is no kill command, you must exit the Telnet session.

If mvtest.exe is failing and the Telnet test is working, it could be that you need a delay in the Startmvs.bat file between the launching of the various pcmsock.exe's.

For example:

After copying the **delay.exe** (included in the ALKMVS.exe) to C:\Windows, edit the Startmvs.bat as follows:

cd \pmw190\tcpip
start pcmsock19 PC_MILER 8190
delay 2

cd \pmw200\tcpip
start pcmsock20 PC_MILER 8200
delay 2

cd \ "Program Files"\ "Alk Technologies"\pmw210\tcpip
start pcmsock210 PC_MILER 8210
delay 2

et cetera

'**Bind Failed**' errors are indicative of port conflicts. If you get a Bind Fail error on initial launch, you will need to change the port number for that version in pcmmv.ini and startmvs.bat.

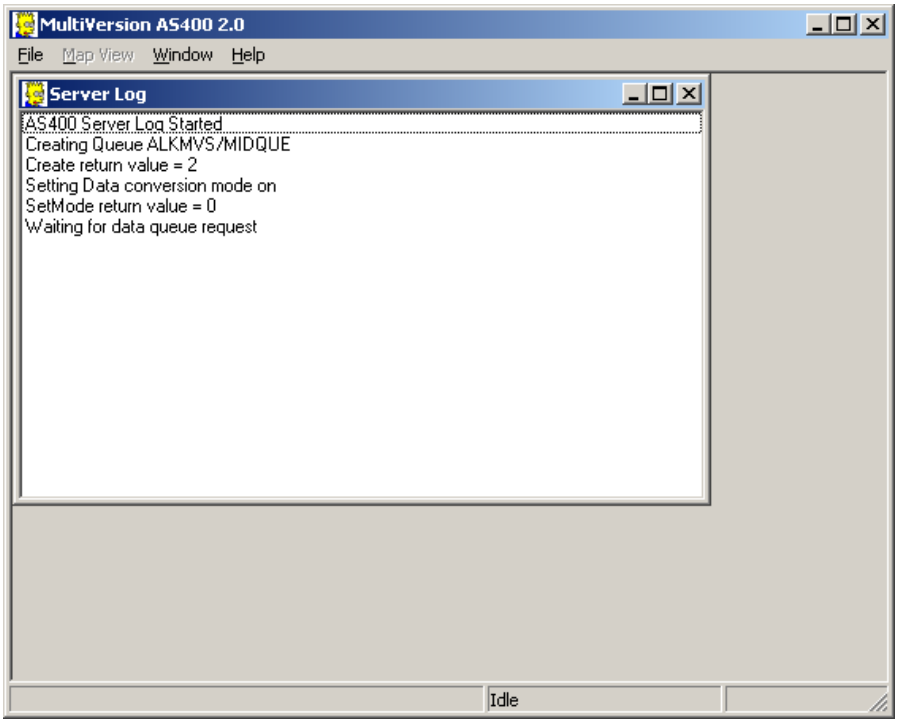
If you are getting a Bind Failed error on a subsequent launching of a version of pcmsock.exe, it is caused by the previous instance not closing properly and it will need to be killed in Task Manager (right-click on the Windows tool bar and select Task Manager > Processes tab > [right-click on pcmsock.exe] > End Process) or by running killmvs.bat.

6.0 Starting and Stopping the Mileage Server

At least one instance of PC*MILER|TCP/IP must be running before you can start PC*MILER-AS/400 Multi-Version Switch (as400.exe). AS400.exe while running maintains a list of available PC*MILER versions. It will find a newly started instance of PC*MILER|TCP/IP and will remove a version which has stopped responding.

If you edit StartMvs.bat and create a shortcut for it in your startup folder as described in installation Step 4.4, the software you installed on your dedicated PC will cause the interface to start automatically when the PC is turned on. If Client Access Express is running on the PC, then click on the PC*MILER AS/400 icon or reboot the PC. Client Access Express must automatically sign on with a user ID and password, if unattended startups of the mileage server PC are desired. (To automate the sign-on process by supplying a user ID and password, see *Appendix D* for Client Access Express.)

When the mileage server (**as400.exe**) starts, it displays the connection status in the mileage server's log window. You can bring up this window by clicking on the mileage server's **Window** menu and choosing *Display Server Log*.



The Name of Mileage Request or Input data queue, and the library in which the queue resides, are logged. The number underneath the data queue name and library is the connection status return code. Good returns are:

0 Connection Good Created Data Queue
2 Connection Good Found Data Queue

Return codes of 1 or 3 are generic error codes that indicate problems with your Client Access Express connections.

NOTE: Both the PC and the AS/400 must agree on the location of the Input or Request data queue. To change the location on the PC, click on the mileage server's **File** menu. Choose *AS/400 Control*, then *Change Library/Queue*. The change is made on the AS/400 by running the **ALKMVS/mvsfig** or ALKMTL/mtlfig command and filling out the library field.

The server log only notes incoming requests. If you need to see the mileage server's outputs, turn on the Log to File feature by selecting the mileage server's **File** menu and choosing *AS400 Control > Highlight Log to File* and choose Append, Overwrite, or Verbose. This will create a file called **c:\ALKMVS\as400.log** or **C:\Alktoll\as400.log**. It is recommended to only use logging for diagnostic purposes, otherwise the log files tend to grow large. **Append** will add to the existing log file, **Overwrite** will delete the current log file, and **Verbose** will append to the existing log file and contains PC-to-AS/400 communication messaging.

6.1 Stopping the Interface

To close PC*MILER|TCP/IP, click *Exit* in the File menu. From the PC*MILER-AS/400 Multi-Version Switch window, choose *Exit* from the File menu.

Included in the Alkmvs and Alktoll directories are Killmvs.bat and process.exe. **Process.exe** is a command line process utility that can exit programs.

After copying Process.exe to C:\Windows the following sample section of **Killmvs.bat** would end all of the pcmsock.exe processes:

process -k pcmsock19.exe
process -k pcmsock19t.exe
process -k pcmsock20.exe
process -k pcmsock20t.exe
process -k as400.exe

The syntax is: process<space>-k<space>[Executable Name]

It can be useful to create a shortcut to killmvs.bat on your desktop.

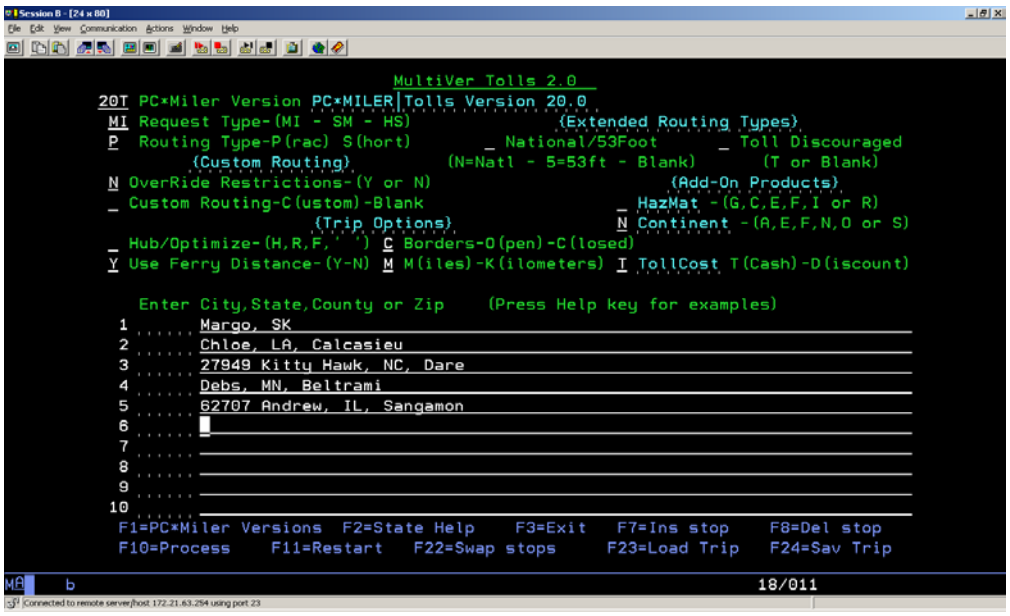
NOTE: If you are closing your router, remember to disconnect the AS/400 beforehand. Please be patient, the PC*MILER mileage server can take a minute

or two to exit. Be sure to disconnect the Netsoft Router from the AS/400 before closing the router. Failure to do so may result in having to reboot the PC before you can reconnect to the AS/400. It is not necessary to manually disconnect a Client Access Express connection.

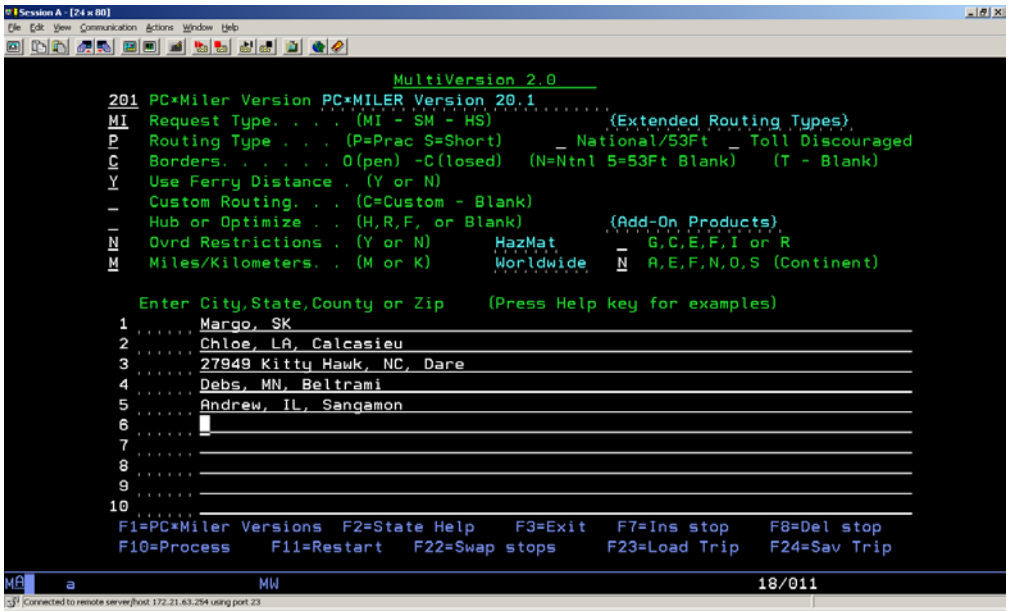
7.0 Using PC*MILER for the AS/400

To use PC*MILER for the AS/400, issue the command **PCMVS** or **PCMTL** for Tolls from the command line. One of the following screens will appear.

PCMVS:



PCMTL:



NOTE: The **PCMVS** or the **PCMTL** command contacts the mileage server to read the data that the mileage server is using. If the **PCMVS** or the **PCMTL** command doesn't respond or the PC*MILER screen comes up with "PC DOWN" in the screen title, there is a problem with the connection to the mileage server PC.

At the top of the main entry screen are several control settings. These include:

PC*MILER Version: The Initial Version will be read from the startup parameters (mvsfig or mtlfig to set). To change versions, type in the 3- character code for that version or press F1 to get a list of available versions. Every time F1 is pressed, the list of available versions is refreshed.

NOTE: The requirements for commas between the city name and the jurisdiction code vary with the requested PC*MILER Version. For Version 14.x and 15.x a comma is required, e.g. Princeton,NJ. For Versions 16.x and higher you can use a comma or a space, e.g. Princeton, NJ or Princeton<space>NJ.

Request Type: "MI", the default entry, will cause PC*MILER (or PC*MILER|Streets) to generate only point-to-point mileage look-ups. "SM" will cause PC*MILER to generate a summary of miles traveled through each state, broken down by toll roads and free roads, in addition to the point-to-point mileage. "HS" will cause PC*MILER to generate detailed driving instructions, in addition to the state mileage summary and point-to-point mileage look-up. It is recommended that HS not be the default routing type unless Users need to have turn by turn driving instructions generated for every distance request.

Toll Cost: (With PC*MILER|Tolls only) 'T' for the Cash price and 'D' for the Discount price. Configuration of Discount program membership is done by running the desktop PC*MILER|Tolls program (pcmwin32.exe), clicking the Route pull-down menu and selecting Default Options > Tolls tab. You must restart your PC mileage server (as400.exe) after making these changes because options are only read by the server at startup.

Graphics requests: Not supported in PC*MILER-AS/400 Multi-Version Switch.

Routing Type: Varies with the version requested.

For Versions 14.x & 15.x the options are:

P (Practical) S (Shortest) N (National Network) T (Toll Discouraged)

For Version 16.x:

P (Practical) S (Shortest) N (National Network) T (Toll Discouraged)
5 (Fifty-three Foot Trailer)

For Version 17.x and Up:

Either Practical or Shortest routing can now be combined with other available PC*MILER routing options (Toll Discouraged, National Network, or 53 Foot Trailer). You must specify either P (Practical) or S (Shortest) for all routes. (Refer to the main PC*MILER *User's Guide* for more detailed descriptions of these routing options.) See Chapter 8, *Using MVS with Other Transportation Software* for details on using this new functionality with other software packages.

NOTE: Beginning in Version 30, the National Network and 53 Foot Trailer route types were combined into one "State + National Network" route.

Route options are described below:

- **Toll Discouraged:** (Version 17 and higher only) "T" will generate miles which avoid long stretches of toll roads. You will receive either a Practical/Toll Discouraged route, or a Shortest/Toll Discouraged route depending on how you have your "Routing Type" set.

- **National/53 Foot:** In Version 17 and higher, "N" will cause PC*MILER to generate miles calculated using the National Network, which is designed for larger trucks. "5" will generate miles suitable for 53'/102" trailer routing. Beginning in Version 30, these two route types are combined and invoking either one will generate the route using the new combined route type. National Network or 53 Foot Trailer will be generated using either the Practical or Shortest routing type. You can also combine National Network or 53 Foot Trailer routing with the Toll Discouraged option. For example you can generate a Practical/Toll Discouraged/National Network route. See Chapter 8, *Using MVS With Other Transportation Software* for details on using this new functionality with other software packages.

- **Borders:** "O" (open borders) lets routes cross international borders to obtain the most efficient trip. "C" will close the borders and routes will only cross international borders if the trip has a stop in that country.

- **Use Ferry Distance:** If set to "Y", distance traveled on ferries will be included in all distance totals. If set to "N" ferry distances are not included in totals. Note: Routes will still include ferry travel but this travel is not included in distance totals.

- **Custom Routing:** "C" will use custom routing preferences (avoids and favors) set in PC*MILER or PC*MILER|Streets. When this position is blank, routing preferences will be disabled.

- **Hub or Optimize:** A blank space is the default entry and is used for the standard PC*MILER operation. "H" is used to initiate the hub distance

generator. "R" is used to initiate route sequencing with the origin fixed and the remaining stops reordered. "F" is used to initiate route sequencing with both the origin and destination fixed and the remaining stops reordered. These options are described in more detail in the main PC*MILER *User's Guide*.

- **Ovrd (Override) Restrictions:**
  Versions 14.x and 15.x not available.
  Versions 16.0 and 16.1 with optional Street Level Add-on Only).
  All versions of 17.0 and higher.

  In addition to the five basic PC*MILER route types, a Heavy and Light Vehicle routing option is now offered. When Ovrd Restrictions is set to "Y", the **Light Vehicle** option is activated. With Light Vehicle routing active, truck-prohibited roads will always be avoided, but truck-restricted roads are considered for a route. (PC*MILER normally gives preference to Interstates, major highways, and major thru-roads where possible.)

  With Ovrd Restrictions set to "N", **Heavy Vehicle** routing is in effect, so both **truck-prohibited and truck-restricted roads will always be avoided**. In addition, Heavy Vehicle routing takes nationwide **13' 6" height restrictions** into account. A heavy vehicle is one weighing at least **80,000 pounds**; a light vehicle weighs less than **80,000 pounds**.

- **Miles/Kilometers:** "M" will cause PC*MILER to generate distances in miles. "K" will cause PC*MILER to generate distances in kilometers.

- **HazMat (Hazardous Material Type):** (optional add-on data module) Types of hazardous material routing that can be generated are: "G" for General, "C" for Caustic, "E" for explosive, "F" for Flammable, "I" for Inhalant, and "R" for Radioactive

- **Region (Continent):** Regions in which mileage can be generated are: "A" for Asia; "E" for Europe; "F" for Africa; "N" for North America; "O" for Oceania; or "S" for South America. (Regions outside North America require PC*MILER|Worldwide.) Toll Cost data is only available for the Continental U.S. in Version 20.1 or higher, and with additional Canadian data in Version 21 or higher.

FOR AN ON-SCREEN DISPLAY OF THESE DEFINITIONS, press the Help key on your keyboard. For Terminal Emulation sessions on PCs, this is typically the **Scroll Lock key or Right Mouse Click > Help**.

In the middle of the screen are the stop entry fields. Enter the city names and state abbreviations for the stop-off locations desired, their ZIP codes, or their latitude/longitude positions. Both the Spelling Helper and ZIP Code Helper

described in the main PC*MILER *User's Guide* are available for use with PC*MILER-AS/400. You may enter up to 30 stop-offs.

NOTE: PC*MILER-AS/400 only supports **Degree-Minute-Second** lat/long format; e.g. **0333716N,1142709W**.

NOTE For PC*MILER|Streets Users: An address should directly follow the city/state or ZIP code entry, separated by a semicolon (e.g. "Princeton, NJ; 1000 Herrontown Road").

You can also purchase separate add-on data modules for Canadian postal codes or SPLC codes. A **Canadian postal code** is entered in the same manner as a ZIP code, but in the following format: **L#L<space> #L#**. (e.g. "K7L 4E7"). A **SPLC** is a six- or nine-digit number, preceded by the letters 'SPLC' (e.g. "SPLC908601").

At the bottom of the screen, the function keys used with PC*MILER for the AS/400 are described. These include:

F1 **PC*MILER Versions**. Displays a pick list of available PC*MILER versions returned from the PC.

F2 **State help**. Displays a list of all state and province abbreviations.

F3 **Exit**. Exits the program and returns to the main AS/400 screen.

F7 **Ins stop**. Allows you to insert a new stop-off where the cursor is positioned.

F8 **Del stop**. Allows you to delete a stop-off where the cursor is positioned.

F10 **Process request**. Sends the request to PC*MILER on the dedicated PC.

F11 **Restart**. Clears the screen, and lets you start making data entries on the screen again.

F12 **Main Screen**. Returns to the main stop entry screen from the mileage report screens.

F22 **Reverse**. Reverses the order of stops entered.

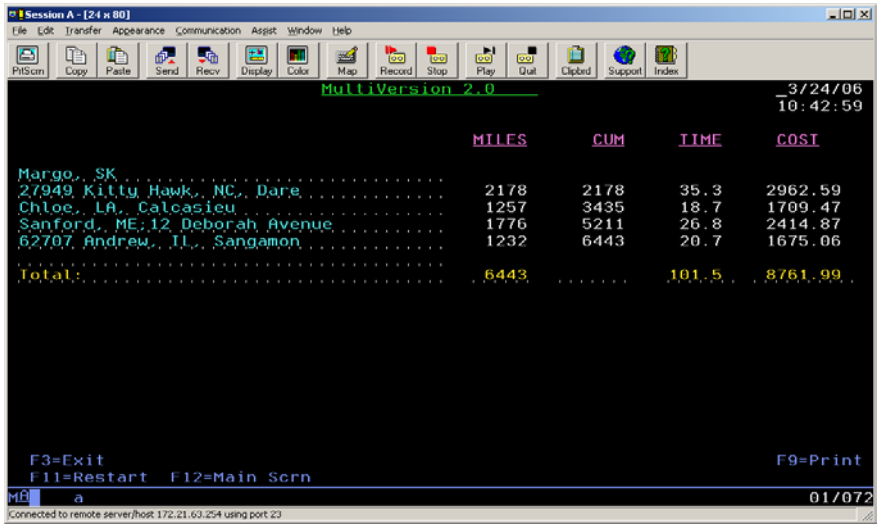
F23 **Load a saved trip**. In the screen that comes up, typing "**X**" (with the cursor on a trip identifier in the pick list) will load that trip; typing "**D**" will delete the trip.

F24 **Save a trip**. Enter a trip identifier of up to 10 characters in the entry field that appears.

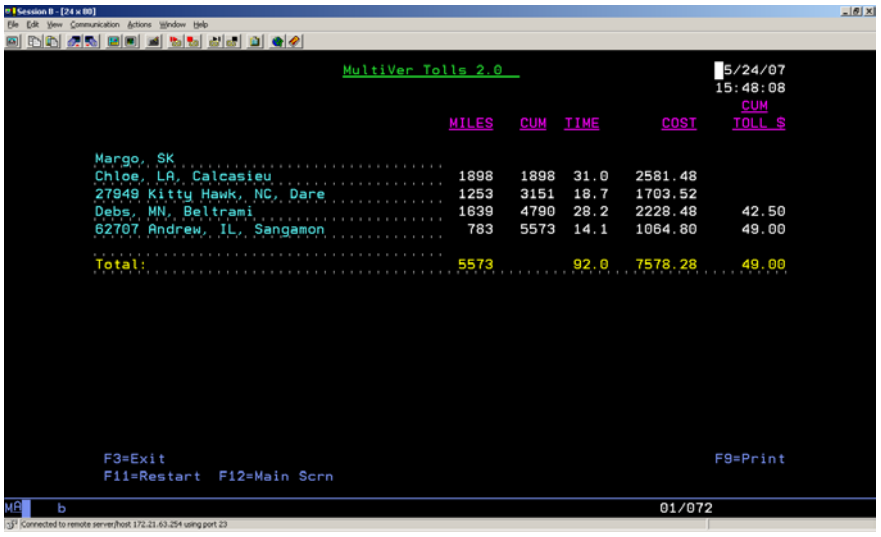
Help Pressing the key labeled "**Help**" on your keyboard will bring up detailed instructions for using various features of PC*MILER for the AS/400. If you are using an emulator, the Help key on your keyboard will usually be the **Scroll Lock** key or **Right Mouse Click > Help**.

Once you have entered stops on the main screen and initiated a mileage inquiry by pressing **<F10>**, the following screen will appear:

PCMVS:



PCMTL:

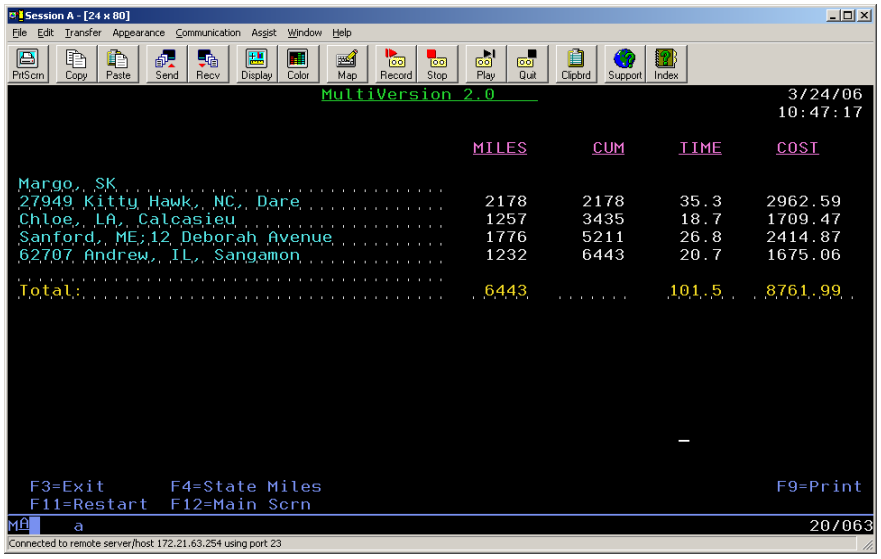


This report contains leg and cumulative miles for each segment of your trip. The time and cost estimates are based on the values contained in the copy of PC*MILER (or PC*MILER|Streets) installed on your dedicated PC. (Refer to the main PC*MILER *User's Guide* installed with PC*MILER for instructions on how to alter these values.) **<F3>** will exit the program. **<F9>** will print the screen. **<F11>** will return you to the previous screen and will clear it. **<F12>** will return you to the previous screen, without clearing it.

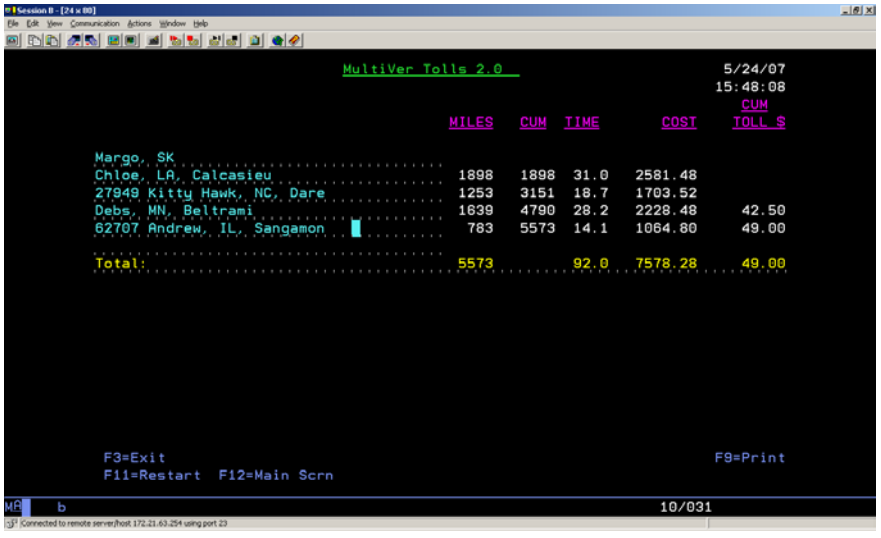
7.1 State Mileage Report

Once you have entered stops on the main screen and initiated a state mileage request (**SM**) by pressing **<F10>**, the following screen will appear:

PCMVS:

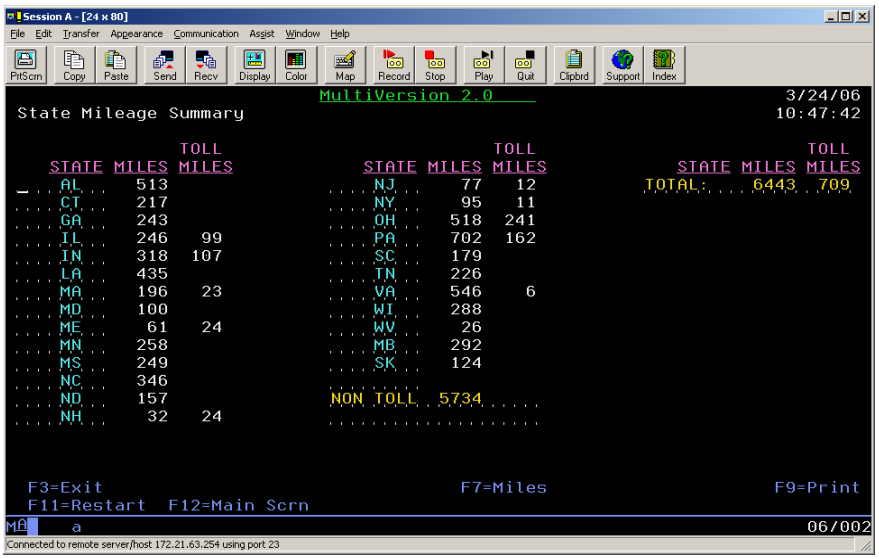


PCMTL:

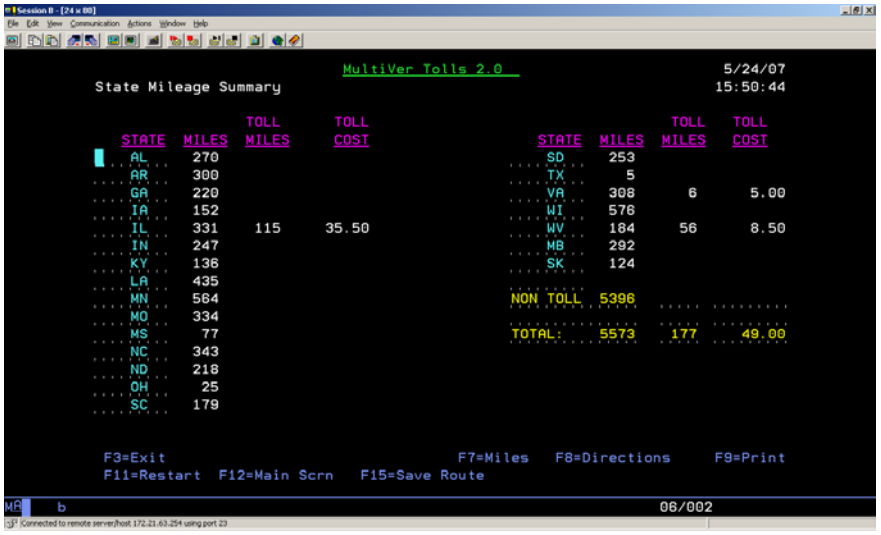


Press **<F4>** for Jurisdiction-by-Jurisdiction distance breakdowns.

PCMVS:



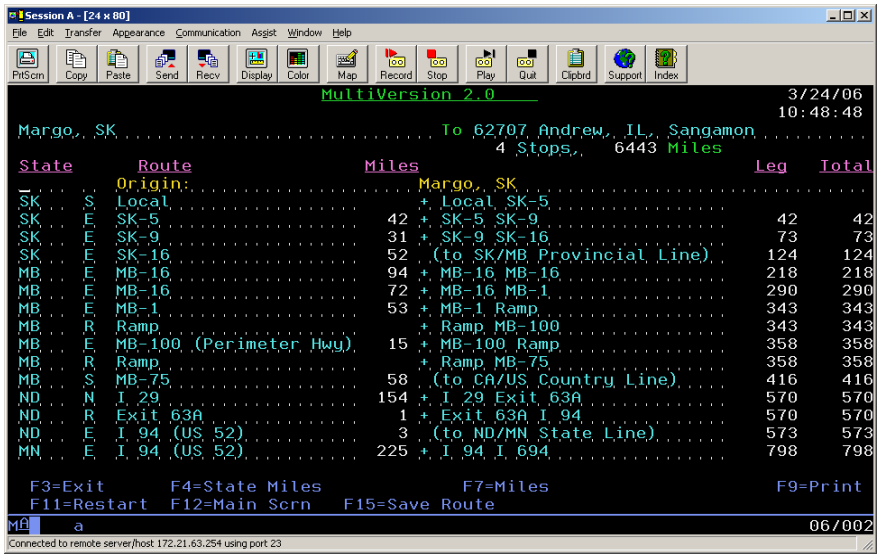
PCMTL:



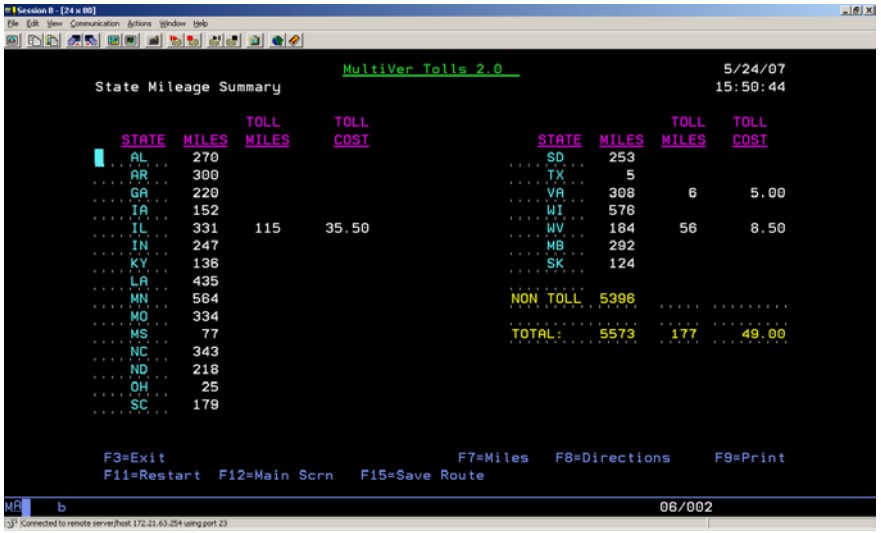
7.2 Detailed Driving Directions Report

After entering stops on the main screen and pressing **<F10>** to initiate a Detailed Driving Directions (**HS**) request, press **<F8>** in the mileage report screen to generate driving directions. When processing is complete, the screen shown below will appear. Note that driving directions take significantly longer to process than miles or state miles because more information is requested and returned.

PCMVS:



PCMTL:



8.0 Using PC*MILER-AS/400 Multi-Version Switch with Other Transportation Software

New for Version 20 - 27:

New Naming Convention for PC*MILER|Tolls Codes.
Up until Version 20.1, there was only a .0 release of the Tolls products and the convention for the PC*MILER version code was to end Tolls versions with a capital "T", for example, "18T".

The new PC*MILER|Tolls code convention is for the .0 version to end in "T" and the .1 version to end in capital "U". For example, "22T" for Tolls 22.0 and "22U" for Tolls 22.1. Use a capital 'W' for Worldwide versions. For example, 21W for PC*MILER|Worldwide Version 21.1.

NOTE: For versions above 27, there is no longer a ".1" version.

Borders Open/Closed and Use Ferry Distance Options.
The first two characters of the four character "Request Sequence" have been remapped to hold the Borders and Ferry flags. Historically the Request Sequence values have been ignored by the PC Distance Server. Unlike other trip options, Border and Ferry settings are not echoed back in the responses from the PC.

For the Optional HazMat Routing package, two new routing types have been added: **Caustic** and **Flammable.**

Note For Existing MVS Users:

Several years ago the number of Route Information segments per response packet (HR Return) was increased from three sets to nine sets to improve performance. See Section 8.2.5 for more information. ALK will provide backward compatible "Three HR Set" PC Mileage Servers upon request. Three HR Set PC Mileage Servers are not available with Border and Use Ferry Options.

PC*MILER-AS/400 Multi-Version Switch is a modified version of PC*MILER|Connect-AS/400. PC*MILER-AS/400 Multi-Version Switch has an additional trip parameter available that enables the user to specify or "Switch" between various versions of PC*MILER. Currently PC*MILER versions 14.x through 29.x, Tolls versions 18 through 29.x, and Worldwide versions 18.1 through 29 are supported (Version 29 available Fall 2015 – note that there are no xx.1 versions beginning in 2014).

PC*MILER-AS/400 Multi-Version Switch is licensed in addition to any PC*MILER versions a company has purchased. All supported versions may not

be available. You will have to make use of the "MV" request to verify what versions are available. Passing blanks will result in the use of Product0 from your Srv32.ini file.

Notes for All Users:

- Changes to route types and jurisdiction codes are not uniform (see chart below).
- Use of comma between city and jurisdiction code is not uniform (see chart below).
- All HS (highway segment) turn-by-turn driving instructions are uniform at the Version 16.x level.
- Override Route Restrictions option not uniformly available (see chart below).
- Versions 16.x and up have more detailed highway networks and therefore have slower response times. You may have to adjust your wait times accordingly.

Notes For Existing PC*MILER|Connect-AS/400 Users:

- A set of 10 new trip parameters has been inserted into all of the request and response packets.
- For Tolls, 7 extra characters were inserted into the CP response type. Multiples of 7 characters have been inserted into the SR and HR response types.
- Output Data Queue sizes were lengthened from 1024 to 1035.
- Data Area "Comalk" (now 'Commvs' or 'Commtl') was modified to store a default PC*MILER version.
- For Tolls Data Area, "Comalk" (now 'Commtl') was modified to store a default Toll request of Cash or Discount.
- "Old mode" or short city names (22 characters) are not supported.
- Graphics (maps) are not supported.

New Routing Options (Version 17 and up):

The routing type options have changed for National Network, Toll Discouraged, and 53' Trailer routing. These three 'special' routing options now can be generated in combination with the 'Practical' or 'Shortest' options. Additionally, National Network or 53' Trailer routing can be combined with the Toll Discouraged options. The only way to take advantage of this new functionality is to pass in the new code in position 1 of the Request Options. (See new codes below.)

Previously the five available codes were:

P = Practical

S = Shortest

N = National Network

T = Toll Discouraged

5 = 53 Foot Trailer

New codes:

P = Practical

S = Shortest

B = Toll Discouraged/Practical

C = National Network/Practical

D = 53 Foot Trailer/Practical

E = Toll Discouraged/National Network/Practical

F = Toll Discouraged/53 Foot Trailer/Practical

G = Toll Discouraged/Shortest

H = National Network/Shortest

I = 53 Foot Trailer/Shortest

J = Toll Discouraged/National Network/Shortest

K = Toll Discouraged/53 Foot Trailer/Shortest

Use of the old codes is still supported, no changes are required. Old codes for National Network (N), Toll Discouraged (T), and 53 Foot Trailer (5) will be generated using the Practical network. Changing this default to the Shortest network is not possible.

NOTE: For users upgrading from PC*MILER|Streets, the Light/Heavy vehicle option has been renamed to 'Override Restrictions'. Parameter codes have changed from L (Light) to Y (Override Restrictions) and H (Heavy) to N (Obey Restrictions). Use of L and H is still supported.

NOTE Also: For Version 16, the HS (Turn-by-Turn Driving Instructions) return packet was changed from previous versions. The fields for Route and Interchange were lengthened and the number of sets of route information was reduced from 4 sets per packet to 3 for the original release of the MVS and Tolls servers and to 9 for this release. See section 8.2.4.1 for full details.

IMPORTANT REMINDER: Users of PC*MILER Versions 14 and 15 must type a comma between the city and the state or province. For Version 16 and up the comma between the city and state or province is optional.

Version-Specific Routing and City Format Information

Version	***Route Types Available***	***City Entry***	***Jurisdiction Info***
PC*MILER 14.x	**P**(ractical) **S**(hortest) **T**(oll Discouraged) **N**(ational Network)	Comma required between city and jurisdiction code	Quebec = **PQ** Newfoundland = **NF**
PC*MILER 15.x	**P**(ractical) **S**(hortest) **T**(oll Discouraged) **N**(ational Network)	Comma required between city and jurisdiction code	Quebec = **PQ** Newfoundland = **NF**
PC*MILER 16.x	**P**(ractical) **S**(hortest) **T**(oll Discouraged) **N**(ational Network) **5**(FiftyThree Foot)	Comma or space required between city and jurisdiction code	Quebec = **QC** Newfoundland = **NF**
PC*MILER 17.x And Up	**P**(ractical) **S**(hortest) **N**(ational Network)(prac) **5**(FiftyThree Foot)(prac) **T**(oll Discouraged)(prac) **B** = Toll Discouraged/Practical **C** = National Network/Practical **D** = 53 Foot Trailer/Practical **E** = Toll Discouraged/National Network/Practical **F** = Toll Discouraged/53 Foot Trailer/Practical **G** = Toll Discouraged/Shortest **H** = National Network/Shortest **I** = 53 Foot Trailer/Shortest **J** = Toll Discouraged/National Network/Shortest **K** = Toll Discouraged/53 Foot Trailer/Shortest	Comma or space required between city and jurisdiction code.	Quebec = **QC** Newfoundland = **NL**

Restriction Overrides by Version

PC*MILER 14.x & 15.x	Feature not available
PC*MILER 16.x	Available with Street Level Add-on Only
PC*MILER 17.x and Up	Available all versions

Codes For PC*MILER Versions *(must be three characters)*

PC*MILER 14.0 = **140**
PC*MILER 15.0 = **150**
PC*MILER 16.0 = **160**
PC*MILER 17.0 = **170**
PC*MILER 18.0 = **180**
PC*MILER 19.0 = **190**
PC*MILER 20.0 = **200**
PC*MILER 21.0 = **210**
PC*MILER 22.0 = **220**
PC*MILER 23.0 = **230**
PC*MILER 24.0 = **240**
PC*MILER 25.0 = **250**
PC*MILER 26.0 = **260**
PC*MILER 27.0 = **270**
PC*MILER 28.0 = **280**
PC*MILER 29.0 = **290**
PC*MILER 14.1 = **141**
PC*MILER 15.1 = **151**
PC*MILER 16.1 = **161**
PC*MILER 17.1 = **171**
PC*MILER 18.1 = **181**
PC*MILER 19.1 = **191**
PC*MILER 20.1 = **201**
PC*MILER 21.1 = **211**
PC*MILER 22.1 = **221**
PC*MILER 23.1 = **231**
PC*MILER 24.1 = **241**
PC*MILER 25.1 = **251**
PC*MILER 26.1 = **261**
PC*MILER 27.1 = **271**
PC*MILER 28 = **280**
PC*MILER 29 = **290**
PC*MILER 30 = **300**
PC*MILER 31 = **310**

PC*MILER|Tolls 21.0 = **21T**
PC*MILER|Tolls 22.0 = **22T**
PC*MILER|Tolls 23.0 = **23T**
PC*MILER|Tolls 24.0 = **24T**
PC*MILER|Tolls 25.0 = **25T**
PC*MILER|Tolls 26.0 = **26T**
PC*MILER|Tolls 27.0 = **27T**
PC*MILER|Tolls 28 **= 28T**
PC*MILER|Tolls 21.1 = **21U**
PC*MILER|Tolls 22.1 = **22U**
PC*MILER|Tolls 23.1 = **23U**
PC*MILER|Tolls 24.1 = **24U**
PC*MILER|Tolls 25.1 = **25U**
PC*MILER|Tolls 26.1 = **26U**
PC*MILER|Tolls 27.1 = **27U**
PC*MILER|Tolls 28 = **28U**
PC*MILER|Tolls 29 = **29U**
FleetSuite Tolls 18.0 = **18T**
FleetSuite Tolls 19.0 = **19T**
FleetSuite Tolls 20.0 = **20T**
FleetSuite Tolls 20.1 = **20U**
PCM|Worldwide 18.1 = **18W**
PCM|Worldwide 19.1 = **19W**
PCM|Worldwide 20.1 = **20W**
PCM|Worldwide 21.1 = **21W**
PCM|Worldwide 22.1 = **22W**
PCM|Worldwide 23.1 = **23W**

8.1 Technical Overview

The PC*MILER-AS/400 system uses distributed processing techniques (i.e. the processing is split into two). The user interface or interactive software is written in RPG and runs on the AS/400. The mileage calculation software is written in C++ and runs on a PC in the Windows environment. The RPG programs communicate with the PC mileage calculation software through Client Access Express. The interactive software on the AS/400 allows multiple users to look up point-to-point mileage and routes for up to thirty stop-off points. The Windows server application creates a data queue on the AS/400 at startup called MIDQUE. The server application waits for mileage requests and processes them when received. The server application responds to an output queue specified within the request packet.

NOTE: For MVS the standard library is ALKMVS (for Tolls it is ALKMTL). Some objects have been renamed to end conflicts with other ALK products. See *Appendix I: Renamed Program Objects* **for more information.**

AS/400 Programs

Files	*Description*
MVSIINQ	Main AS/400 inquiry program that sends request to MIDQUE data queue
MVTIINQ	Main AS/400 inquiry program that sends request to MIDQUE data queue for Tolls
CITMVS	RPG program that verifies city ZIP spelling
CITMTL	RPG program that verifies city ZIP spelling (Tolls)
CRTQ	CL program that creates an output data queue based on the job number
DELQ	CL program that deletes the queue created by CRTQ
GETLAT	Sample RPG Program that converts City, Jurisdiction pairs or ZIP codes to Lat/longs
GETLATC	CL program that creates output queue and starts GETLAT RPG
GETMILV	Sample RPG Program performs point-to-point mileage lookups
GETMILVC	CL program that creates output queue and starts GETMIL RPG
MVVADR	RPG Program that validates ZIP codes, place names, and street addresses; also provides pick lists of ZIP codes, names and addresses when partial name, ZIP or address is passed in RPG parameters.
VMTADR	RPG Program that validates ZIP codes, place names, and street addresses; also provides pick lists of ZIP codes, names and addresses when partial name, ZIP or address is passed in RPG parameters.
MIDQUE	Data queue that contains input mileage lookup records
MVSIINQC	CL program that creates output data queue and starts MVSIINQ rpg
MVTIINQC	CL program that creates output data queue and starts MVTIINQ rpg for Tolls.
QUEUE	CL program that writes to the MIDQUE request data queue

MVSEND	External data structure for sending mileage requests
MVRESP	External data structure for receiving mileage output
MVSEND2	Sample external data structure with Borders Open/Closed and Use Ferry Distance Fields
MTSEND	External data structure for sending mileage requests
MTSEND2	Sample external data structure with Borders Open/Closed and Use Ferry Distance Fields
MTRESP	External data structure for receiving mileage output

The programs MVSIINQ and MTLIINQ contain two subroutines that can be used to integrate miles with other transportation software. The subroutine SNDREQ sends mileage requests to PC*MILER and the subroutine RSLT receives mileage results from PC*MILER.

The PC mileage server can respond to a total of five types of Mileage Requests:

Mileage:

VN = Version of PC*MILER-AS/400 Multi-Version Switch being used by the server
MV = **Versions of PC*MILER Highway Data available.**
VA = Validation that a stop (City, ZIP code, etc.) is recognized by PC*MILER or a list of possible matches to a partial city or ZIP code
MI = Total mileage for up to 30 stops
SM = Total mileage for up to 30 stops broken down by state or province
HS = Turn-by-turn driving instructions for up to 30 stops

The PC mileage server responds with the following types of returns:

VR – Version of PC*MILER or PC*MILER|Streets running on the PC
NS – **Version(s) of PC*MILER running available.**
PL – Good/Bad Stop or a 'pick list' of potential matches
CP – Total Miles for a trip
SR – Total Miles for a trip broken down by state or province
HR – Turn-by-turn driving instructions or "highway segments"
VN returns a VR
MV returns a NS
VA returns a PL
MI returns a CP
SM returns a CP and an SR.
HS returns a CP, an SR and an HR

8.2 Request and Response Field Parameters

The following sections specify the field parameters for the request types defined in section 8.1 and the responses to each request type.

IMPORTANT NOTE: When using PC*MILER|Streets, the best matching for address location lookups can be accomplished using the guidelines stated below. These rules apply to batch or interactive integration. **It is recommended that a validation (VA) request always precede each mileage request, especially where street addresses are included,** in order to avoid misleading or incomplete output.

- When you input a street address, use a city and state abbreviation whenever possible.
  Example: **Princeton, NJ;1000 Herrontown Road** – The comma between the city and state is optional. The semicolon between the state abbreviation and the street address is required.

- Use a street number.
  Example: **Princeton, NJ;1000 Herrontown Road** as opposed to "Princeton, NJ;Herrontown Road". In this example, if Herrontown Road is 50 miles long and no address is included, the returned mileage could be very inaccurate.

- When a street address is not supplied, do not send a semi-colon.
  Example: Send **08540** as opposed to "08540;" – a semi-colon will cause the server to look up a blank address which is not necessary.

  Three examples of correct input:
  Trenton, NJ;21 Olden Avenue
  New York, NY;118 Broadway
  20001

8.2.1 PC*MILER Versions Available (MV) Request and Response

It is recommended that you maintain a list of available versions via the MV request type. Within the MV return is a space-delimited list of available versions. For example: **200 21T 21W 22T 23T 24T 25T 26T 27T 28T 29T 30T 31T**

NOTE: The PC*MILER-AS/400 Multi-Version Switch PC mileage server is designed such that if the mileage server (as400.exe) loses connection to a particular version of PC*MILER, the affected version will be removed from the list.

Version Request:

Var Name	Len	Value	Description
REQ-TYPE	2	MV	PC*MILER Versions Available
REQ-REF	10		Output Queue Name (ALK uses "Q" plus job number)
REQ-PARMS	10		Optional
REQ-SEQUENCE	4		Optional
REQ-ERROR	2		
REQ-MVS	3		Optional
REQ-FILL	237		Blank Fill
Total	268		

Version Response:

Var Name	Len	Value	Description
RESP-TYPE	2	NV	Stop pick list
RESP-REF	10		Output Queue Name
RESP-PARMS	10		Trip Parms
RESP-SEQUENCE	4		Always 0001
RESP-ERR	2		Pos 27-28 Error Code
RESP-MVS	3		Pos 29-31) PC*MILER Version
RESP-FILL	7		Pos 32-38) Not Used
RESP-VERSIONS	228		Array of space delimited, left justified, 3 character versions; e.g. 140<space>150<space>161

8.2.2 Stop Validation (VA) Request and Response

The following are field parameters for stop and (for PC*MILER|Streets users) street address validation. A stop can be a city/state pair separated by a comma, a ZIP code, a latitude/longitude point or (with optional add-on modules) a Canadian Postal code or SPLC (Standard Position Location Codes). PC*MILER|Streets users may include street addresses.

Validation requests are important because error reporting in mileage requests is limited to the first two stops of a trip. If your bad stop is lower in the list of stops,

you will not be told which is the nonvalid stop, you will get a generic "Can't Run Trip" message. The VA request type can be used to produce lists of potential matches to partial spellings or ZIP codes.

Validation Request:

Var Name	Len	Value	Description Extended Format
REQ-TYPE	2	VA	Validate Stop or Address
REQ-REF	10		Output Queue Name (ALK uses "Q" plus job number)
Filler-6	6		
REGION **(Worldwide Only)**	1		Pos 19) A=Asia E=Europe, F=Africa N=North America O=Oceania S=South America
Filler 1	1		
Force Pick List	1	P	Pos 21) P or Blank P=Force Pick List, or use wildcard * after a partial city or address
Filler-17	**17**		**Pos 22-38) blanks, previously 7 characters.**
REQ-CIT	70		70 bytes each left justified 38 byte maximum city name 1 byte comma (optional) 2 byte state abbrev 1 byte comma (optional) 13 byte county name (optional) or for Streets 1 byte semicolon ; followed by street address Examples Warminster,PA,BUCKS Warminster,PA;1174 NASSAU ROAD 18974 Lat/long format should be 1234567N,1234567W 5 digit zips only Canadian Postal Codes use the format L#L<space> #L# (add-on data module) For Standard Position Location Codes SPLC plus the number (add-on data module)
Filler-CIT	630		blank

Validation Response:

Var Name	Len	Value	Description Extended Format
RESP-TYPE	2	PL	Stop pick list
RESP-REF	10		Output Queue Name
Filler-3	3		3 blanks
RESP-MORE	1		Pos 16) M = more data to follow
Filler-2	2		
REGION	1		Pos 19) Echoed from Request

Match	1		Pos 20)
		L	List of Cities
		Y	Exact match
		N	No match
Force Pick List			Pos 21) Echoed from Request P or Blank
Filler-1	1		1 blank
RESP-Seq	4		Pos 23-26) Sequence for multiple responses
RESP-ERR	2		Pos 27-28 Error Code
		E2	Place not found
		EA = invalid or not found server ID	
		EB = invalid trip ID	
		EC = error writing to queue	
		ED = Incomplete Record/Header	
RESP-MVS	**3**		**Pos 29-31 (3-character PC*MILER Version)**
			Pos 32-38) Not Used
RESP-CIT	980		Array of 14 places 70 bytes each left justified
			or
			Error message if there is a problem
Filler	15		

8.2.3 Point-to-point Miles (MI) Request and Response

1. (Request) The following are field parameters for requesting miles. The purpose of the Mileage request is to allow the host application to retrieve point-to-point miles. This type of request could be used for a quick mile lookup from a host inquire program or for running several stop-off points in a batch environment. The host dispatching software could generate this request when a new trip is established.

Var Name	**Len**	**Value**	**Description**	**Extended Format**
REQ-TYPE	2	MI	Miles request	
REQ-REF	10		Output Queue Name	
			(ALK uses 'Q' + the job number)	
Trip Options Positions 13-22			Request Position	
REQ-OPTION	1		Pos 1)	S=Shortest
				P=Practical
				N=National/Practical
				T=Toll Discouraged/Practical
				5=53' Trailer/Practical
				B=Toll Discouraged/Practical
				C=National Network/Practical
				D=53 Foot Trailer/Practical
				E=Toll Discouraged/National Network/Practical
				F=Toll Discouraged/53 Foot Trailer/Practical
				G=Toll Discouraged/Shortest
				H=National Network/Shortest
				I=53 Foot Trailer/Shortest
				J=Toll Discouraged/National Network/Shortest
				K=Toll Discouraged/53 Foot Trailer/ Shortest
	1		Pos 2)	M or K for miles or kilometers
	1		Pos 3)	R=resequence stops

		H=hub leg miles F=resequence stops fixed destination blank=otherwise
REQ-MORE	1	Pos 4) M=more data to follow
	1	Pos 5) Reserved by DR request
REQ-FMT	1	Pos 6) E =Extended Format (Required, see Appendix A)
REQ-REGION (Worldwide Only)	1	Pos 7) A=Asia E=Europe, F=Africa N=North America O=Oceania S=South America
REQ-CUSTOM	1	Pos 8) C=Custom, blank=default
REQ-Ovrd Restrictions	1	Pos 9) Y=Override Restrictions or L=Light N=Obey Restrictions or H=Heavy
REQ-Hazmat (Data Add-on) **New v20 →**	1	Pos 10) G = General Restriction **C=Caustic** E = Explosive Restriction
New v20 →		**F=Flammable** I = Inhalant Restriction R = Radioactive Restriction
REQ-BRDR	**1**	**Pos11) O=Borders Open C= Closed** (Value not echoed back in response)
REQ-FERRY	**1**	**Pos12) Y=Include Ferry Distance N=Do Not Include Ferry Distance** (Value not echoed back in response)
REQ-SEQ	**2**	**Sequence for multiple responses** (Not Read by PC)
REQ-ERR	2	Error Code
REQ-MVS	**3** **(Position 29-31)**	**Requested PCMILER Version** **140=PC*MILER Version 14** **141=PC*MILER Version 14.1** **150=PC*MILER Version 15.0** **151=PCMILER Version 15.1 et cetera**
MVS TOLL	**1**	**Pos 32)T =Tolls/Cash D=Discount or Blank (Tolls Versions Only)**
REQ-FILL	**6**	**Blank Fill**
REQ-CIT	700	Array of 10 places 70 bytes each left justified 3 sets of 700 when using the more flag 38 byte maximum city name 1 byte comma 2 byte state abbrev 1 byte comma (optional) 13 byte county name (optional) or 1 byte semicolon ; followed by street address Examples Warminster,PA,BUCKS Warminster,PA;1174 NASSAU ROAD 18974 Lat/long format should be 1234567N,1234567W 5 digit zips only Canadian Postal Codes use L#L<space> #L# Standard Position Location Code use SPLC+number

NOTE: REQ-SEQ is not read for MI requests. REQ-BRDR and REQ-FERRY values are not back in the PC responses.

2. (Response) The following are field parameters for output miles. The City Pair response returns an output to the host application that contains city names and ZIP codes along with miles, cost and time estimates. The CP response is always returned first for all three request types (MI, SM, and HS).

Var Name	**Len**	**Value**	**Description** **Extended Format**
RESP-TYPE	2	CP	City pair returned output
RESP-REF	10		Output Queue Name (ALK uses 'Q' + the job number)
Request Options 13-22			
RESP-NET	1		Pos 1) S=Shortest P=Practical N=National/Practical T=Toll Discouraged/Practical 5=53' Trailer/Practical B=Toll Discouraged/Practical C=National Network/Practical D=53 Foot Trailer/Practical E=Toll Discouraged/National Network/Practical F=Toll Discouraged/53 Foot Trailer/Practical G=Toll Discouraged/Shortest H=National Network/Shortest I=53 Foot Trailer/Shortest J=Toll Discouraged/National Network/Shortest K=Toll Discouraged/53 Foot Trailer/ Shortest
RESP-MIL-TYPE	1		Pos 2) M or K for miles or kilometers
RESP-OPTION	1		Pos 3) R = resequence stops H = hub leg miles F = resequence stops fixed destination blank = otherwise
RESP-MORE	1		Pos 4) M = more data to follow
			Pos 5) Reserved by DR request
	1		Pos 6) E=Extended Format
RESP-REGION	1		Pos 7) A=Asia,E=Europe,F=Africa,N=North America,O=Oceania,S=South America
RESP-Custom Routing	1		Pos 8) C=Custom, blank=default
RESP-Ovrd Restrictions	1		Pos 9) Y=Override Restrictions or L=Light N=Obey Restrictions or H=Heavy
RESP-Hazmat	1		Pos 10) G = General Restriction **C=Caustic** E = Explosive Restriction **F=Flammable** I = Inhalant Restriction R = Radioactive Restriction
RESP-SEQ	4		Sequence for multiple responses
RESP-ERR	2		Error Code
		E1	First state not found
		E2	First city not found
		E3	Second state not found
		E4	Second city not found
		E5	Unable to resequence
		E6	Unable to calculate route
		E9	Disconnected Highway Network

			EA = invalid or not found server ID **EB = invalid trip ID** **EC = error writing to queue** **ED = Incomplete Record/Header**
RESP-MVS	**3**		**PC*MILER Version (Pos 29-31)**
RESP-TOLL	**1**		**T=Tolls/Cash D=Discount or Blank (Pos 32)**
RESP-Fill	**6**		**PC*MILER Version (Pos 33-38)**
RESP-CIT1	39		39 bytes All stop information including Zip and\or city\state and\or county and\or Street address or If there is error the pcmiler error code
RESP-CIT2	39		39 bytes All stop information including Zip and\or city\state and\or county and\or Street address
RESP-MILE	5		Total miles returned or PC*MILER 3-digit error code
RESP-HOUR	4		Total time in hours (0031) = 3.1 hours
RESP-COST	7		Total cost for city pair (0052295) = 522.95
FILL134	134		Blank Fill

For Tolls Only:

RESP-MILE	**5**	**Total miles returned or 3-digit error code**
RESP-HOUR	**4**	**Total time in hours (0031) = 3.1 hours**
RESP-COST	**7**	**Total cost for city pair (0052295) = 522.95**
RESP-Toll	**7**	**Total Toll Cost (0000500) = $5.00**
FILL128	**128**	**Blank Fill**

8.2.4 State Miles (SM) Request and Response

(Request) The following are field parameters for a state miles request. The purpose of this request is to attain the state-by-state mileage information associated with a trip.

Var Name	**Len**	**Value**	**Description** **Extended Format**
REQ-TYPE	2	SM	Miles request
REQ-REF	10		Output Queue Name (ALK uses 'Q' + the job number)
Request Options 13-22			
REQ-OPTION	1		Pos 1) S=Shortest P=Practical N=National/Practical T=Toll Discouraged/Practical 5=53' Trailer/Practical

		B=Toll Discouraged/Practical C=National Network/Practical D=53 Foot Trailer/Practical E=Toll Discouraged/National Network/Practical F=Toll Discouraged/53 Foot Trailer/Practical G=Toll Discouraged/Shortest H=National Network/Shortest I=53 Foot Trailer/Shortest J=Toll Discouraged/National Network/Shortest K=Toll Discouraged/53 Foot Trailer/ Shortest
	1	Pos 2) M or K for miles or kilometers
	1	Pos 3) R = resequence stops H = hub leg miles F = resequence stops fixed destination blank = otherwise
REQ-MORE	1	Pos 4) M = more data to follow
	1	Pos 5) Reserved by DR request
REQ-FMT	1	Pos 6) E = Extended Format (Required see appendix A)
REQ-REGION (Worldwide Only)	1	Pos 7) A=Asia E=Europe, F=Africa N=North America O=Oceania S=South America
REQ-Custom Routing	1	Pos 8) C=Custom, blank=default
REQ-Ovrd Restrictions	1	Pos 9) Y=Override Restrictions or L=Light N=Obey Restrictions or H=Heavy
REQ-Hazmat **New =>** **New =>**	1	Pos 10) G = General Restriction **C=Caustic** E = Explosive Restriction **F=Flammable** I = Inhalant Restriction R = Radioactive Restriction
REQ-BRDR	**1**	**Pos11) O=Borders Open C= Closed** (Value not echoed back in response)
REQ-FERRY	**1**	**Pos12) Y=Include Ferry Distance N=Do Not Include Ferry Distance** (Value not echoed back in response)
REQ-SEQ	**2**	**Sequence for multiple responses (Not Read by PC)**
REQ-ERR	2	Error Code
REQ-MVS	**3** **(Position 29-31)**	**Requested PCMILER Version** **140=PC*MILER Version 14** **141=PC*MILER Version 14.1** **150=PC*MILER Version 15.0** **151=PCMILER Version 15.1 et cetera**
RESP-TOLL	**1**	**T=Tolls/Cash D=Discount or Blank (Pos 32)**
REQ-FILL	**6**	**Blank Fill**
REQ-CIT	700	Array of 10 places 70 bytes each left justified 3 sets of 700 when using the more flag 38 byte maximum city name 1 byte comma 2 byte state abbrev 1 byte comma (optional) 13 byte county name (optional) or

1 byte semicolon ; followed by street address

Examples
Warminster,PA,BUCKS
Warminster,PA;1174 NASSAU ROAD
18974
Lat/long format should be 1234567N,1234567W
5 digit zips only
Canadian Postal Codes use the format L#L #L#

NOTE: REQ-SEQ is not read for SM requests.
REQ-BRDR and REQ-FERRY values are not echoed back in the PC responses.

2. (Response) The following are field parameters for the state miles output. The PC will respond with the miles (or kilometers) for the stops indicated in the "SM" request. There will be 10 state miles returned for each record. If additional records are needed, an "M" in the "MORE" parameters field is used to indicate that there is more data to follow.

NOTES: A "CP" (city pair, point-to-point miles) response is always returned first for all three request types (MI, SM, and HS), and an "SR" (state miles) output record follows the "CP" response to an "HS" (highway system, detailed route information) request (see section 8.2.4).

Response from PC	Len	Value	Description
REQTYPE	2	SR	State miles summary
REFNUM	10		Output Queue Name (ALK uses 'Q' + the job number)
Request Options 13-22			
PARMS	1		Pos 1) S=Shortest P=Practical N=National/Practical T=Toll Discouraged/Practical 5=53' Trailer/Practical B=Toll Discouraged/Practical C=National Network/Practical D=53 Foot Trailer/Practical E=Toll Discouraged/National Network/Practical F=Toll Discouraged/53 Foot Trailer/Practical G=Toll Discouraged/Shortest H=National Network/Shortest I=53 Foot Trailer/Shortest J=Toll Discouraged/National Network/Shortest K=Toll Discouraged/53 Foot Trailer/Shortest
	1		Pos 2) M or K for miles or kilometers
	1		Pos 3) R = resequence stops H = hub leg miles F = resequence stops fixed destination blank = otherwise
RESP-MORE	1		Pos 4) M = more data to follow
	1		Pos 5) Reserved by DR request

RESP-FMT	1		Pos 6) E = Extended Format (Required, see Appendix A)
RESP-REGION	1		Pos 7) A=Asia,E=Europe,F=Africa,N=North America,O=Oceania,S=South America
RESP-Custom Routing	1		Pos 8) C=Custom, blank=default
RESP-Ovrd Restrictions	1		Pos 9) Y=Override Restrictions or L=Light N=Obey Restrictions or H=Heavy
RESP-Hazmat	1		Pos 10) G = General Restriction **C=Caustic** E = Explosive Restriction **F=Flammable** I = Inhalant Restriction R = Radioactive Restriction
RESP-SEQNUM	4		Sequence for multiple responses
RESP-ERROR	2		Error Code
		E1	First state not found
		E2	First city not found
		E3	Second state not found
		E4	Second city not found
		E5	Unable to resequence
		E6	Unable to calculate route
		E9	Disconnected Highway Network
		EA = invalid or not found server ID	
		EB = invalid trip ID	
		EC = error writing to queue	
		ED = Incomplete Record/Header	
RESP-MVS	**3**		**PC*MILER Version (Pos 29-31)**
RESP-TOLL	**1**		**PC*MILER Version (Pos 32)**
RESP-Fill	**6**		**PC*MILER Version (Pos 32-38)**
STATEMIL	220		10 elements each element will consist of: 2 for state code 5 for total miles 4 for toll miles
FILLER	118		

For Tolls Only:

STATEMIL Info	**180**	**10 elements each element will consist of:**
	10 sets of {	**2 for state code** **5 for total miles** **4 for toll miles** **7 for toll cost**
FILL	**49**	

8.2.5 Detailed Route Information (HS) Request and Response

1. (Request) Following are parameters for a route and state miles request. The purpose of this request is to allow the Host to retrieve detailed route information based on the city pair stop-off points.

Var Name	Len	Value	Description	Extended Format
REQ-TYPE	2	HS	Miles request	
REQ-REF	10		Output Queue Name (ALK uses 'Q' + the job number)	
Request Options 13-22				
REQ-OPTION	1		Pos 1)	S=Shortest P=Practical N=National/Practical T=Toll Discouraged/Practical 5=53' Trailer/Practical B=Toll Discouraged/Practical C=National Network/Practical D=53 Foot Trailer/Practical E=Toll Discouraged/National Network/Practical F=Toll Discouraged/53 Foot Trailer/Practical G=Toll Discouraged/Shortest H=National Network/Shortest I=53 Foot Trailer/Shortest J=Toll Discouraged/National Network/Shortest K=Toll Discouraged/53 Foot Trailer/Shortest
	1		Pos 2)	M or K for miles or kilometers
	1		Pos 3)	R = resequence stops H = hub leg miles F = resequence stops fixed destination blank = otherwise
REQ-MORE	1		Pos 4)	M = more data to follow
	1		Pos 5)	Reserved by DR request
REQ-FMT	1		Pos 6)	E = Extended Format (Required, see Appendix A)
REQ-REGION	1		Pos 7)	A=Asia,E=Europe,F=Africa,N=North America, O=Oceania,S=South America
REQ-Custom Routing	1		Pos 8)	C=Custom, blank=default
REQ-Ovrd Restrictions	1		Pos 9)	Y=Override Restrictions or L=Light N=Obey Restrictions or H=Heavy
REQ-Hazmat	1		Pos 10)	G = General Restriction **C=Caustic** E = Explosive Restriction **F=Flammable** I = Inhalant Restriction R = Radioactive Restriction
REQ-BRDR	1		Pos11)	O=Borders Open C= Closed (Value not echoed back in response)
REQ-FERRY	1		Pos12)	Y=Include Ferry Distance N=Do Not Include Ferry Distance

		(Value not echoed back in response)
REQ-SEQ	2	**Sequence for multiple responses** (Not Read by PC)
REQ-ERR	2	Error Code
REQ-MVS	**3** **(Position 29-31)**	**Requested PCMILER Version** **140=PC*MILER Version 14** **141=PC*MILER Version 14.1** **150=PC*MILER Version 15.0** **151=PCMILER Version 15.1 et cetera**
RESP-TOLL	**1**	**T=Tolls/Cash D=Discount or Blank (Pos 32)**
REQ-FILL	**6**	**Blank Fill**
REQ-CIT	700	Array of 10 places 70 bytes each left justified 3 sets of 700 when using the more flag 38 byte maximum city name 1 byte comma 2 byte state abbrev 1 byte comma (optional) 13 byte county name (optional) or 1 byte semicolon ; followed by street address Examples Warminster,PA,BUCKS Warminster,PA;1174 NASSAU ROAD 18974 Lat/long format should be 1234567N,1234567W 5 digit zips only Canadian Postal Codes use the formal L#L #L#

2. (Response) Following are field parameters for a response to the route and state miles request. The PC response record has all of the required detailed route information. There are four route list records\response records. Therefore, if there are more than four records for the route, additional response records must be returned. Multiple returned records are designated by the "M" in the "MORE" parameter field.

REMEMBER: A "CP" and "SR" output record will always precede the "HR" response record.

Response from PC	**Len**	**Value**	**Description**
REQTYPE	2	HR	Route highway information returned
REFNUM	10		Output Queue Name (ALK uses 'Q' + the job number)
Request Options 13-22			
REQ-OPTION	1		Pos 1) S=Shortest P=Practical N=National/Practical T=Toll Discouraged/Practical 5=53' Trailer/Practical B=Toll Discouraged/Practical C=National Network/Practical D=53 Foot Trailer/Practical

			E=Toll Discouraged/National Network/Practical F=Toll Discouraged/53 Foot Trailer/Practical G=Toll Discouraged/Shortest H=National Network/Shortest I=53 Foot Trailer/Shortest J=Toll Discouraged/National Network/Shortest K=Toll Discouraged/53 Foot Trailer/Shortest
	1		Pos 2) M or K for miles or kilometers
	1		Pos 3) R = resequence stops H = hub leg miles F = resequence stops fixed destination blank = otherwise
REQ-MORE	1		Pos 4) M = more data to follow
	1		Pos 5) Reserved by DR request
REQ-FMT	1		Pos 6) E = Extended Format (Required, see Appendix A)
REQ-REGION	1		Pos 7) A=Asia,E=Europe,F=Africa,N=North America,O=Oceania,S=South America
REQ-Custom Routing	1		Pos 8) C=Custom, blank=default
REQ-Ovrd Restrictions	1		Pos 9) Y=Override Restrictions or L=Light N=Obey Restrictions or H=Heavy
REQ-Hazmat	1		Pos 10) G = General Restriction **C=Caustic** E = Explosive Restriction **F=Flammable** I = Inhalant Restriction R = Radioactive Restriction
REQ-SEQNUM	4		Sequence for multiple responses
REQ-ERROR	2		Error code
		E1	First state not found
		E2	First city not found
		E3	Second state not found
		E4	Second city not found
		E5	Unable to resequence
		E9	Disconnected Highway Network
		EA = invalid or not found server ID	
		EB = invalid trip ID	
		EC = error writing to queue	
		ED = Incomplete Record/Header	
RESP-MVS	**3**		**PC*MILER Version (Pos 29-31)**
RESP-Fill	**7**		**PC*MILER Version (Pos 32-38)**
Route Information	**900**		**9 Sets of 100 Each**
ROUTEINFO			2 indicates end of route data for stop
			2 state code
			1 toll indicator
Increase from 3 to 9 sets		**{**	6 directional (North, Turn L, etc)
			35 route number
			4 leg mileage
			38 for intersection city or junction
			6 for cumulative leg miles
			6 for cumulative stop miles

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RESP-MVS	**3**		**PC*MILER Version (Pos 29-31)**
RESP-TOLL	**1**		**T=Tolls/Cash D=Discount or Blank (Pos 32)**
RESP-Fill	**6**		**PC*MILER Version (Pos 33-38)**
RouteInfo	**963**		**9 Sets of 107 Each**
ROUTEINFO			**2 indicates end of route data for stop**
			2 state code
			1 toll indicator
		9 sets {	**6 directional (North, Turn L, etc)**
			35 route number
			4 leg mileage
			38 for intersection city or junction
			6 for cumulative leg miles
			6 for cumulative stop miles
			7=Toll Cost
FILLER	**34**		

NOTES: The PC will send CP response records for MI requests.
The PC will send CP and SR response records for SM requests.
The PC will send CP, SR, and HR response records for HS requests

8.2.5.1 Upgrade Notice

All HR returns regardless of requested PC*MILER Version return the larger V16 + format.

In Version 16 and 17, the ROUTEINFO portion of the HS return was increased by 25 characters and the number of ROUTEINFO Sets per response packet was decreased from four sets to three. Route Number was increased 15 characters from 20 to 35 (Highway , Road or Street Name), and Interchange City or Junction was increased 10 characters from 28 to 38.

The previous format is shown below.

Format found in PC*MILER versions 14 and 15:

ROUTEINFO		2 indicates end of route data for stop
		2 state code
		1 toll indicator
	4 sets {	6 directional (North, Turn L, etc)
		20 route number
		4 leg mileage
		28 for intersection city or junction
		8 for cumulative leg miles
		6 for cumulative stop miles

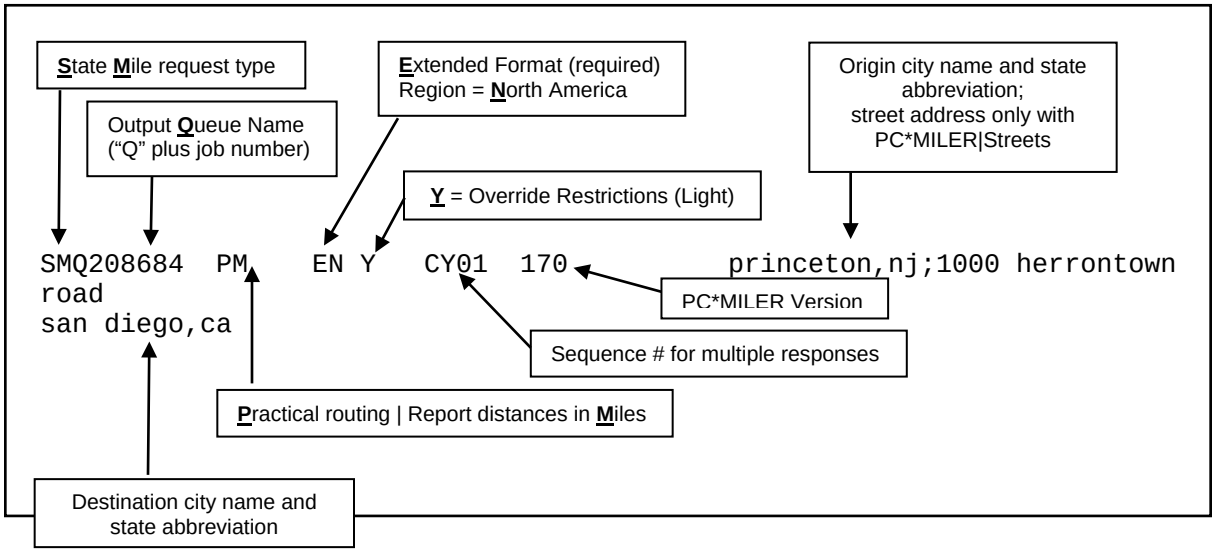
PC*MILER V16 and Higher and Existing ALK|FleetSuite MVS:

ROUTEINFO		2 indicates end of route data for stop
		2 state code
		1 toll indicator
	3 sets {	6 directional (North, Turn L, etc)
		35 route number
		4 leg mileage
		38 for intersection city or junction
		6 for cumulative leg miles
		6 for cumulative stop miles

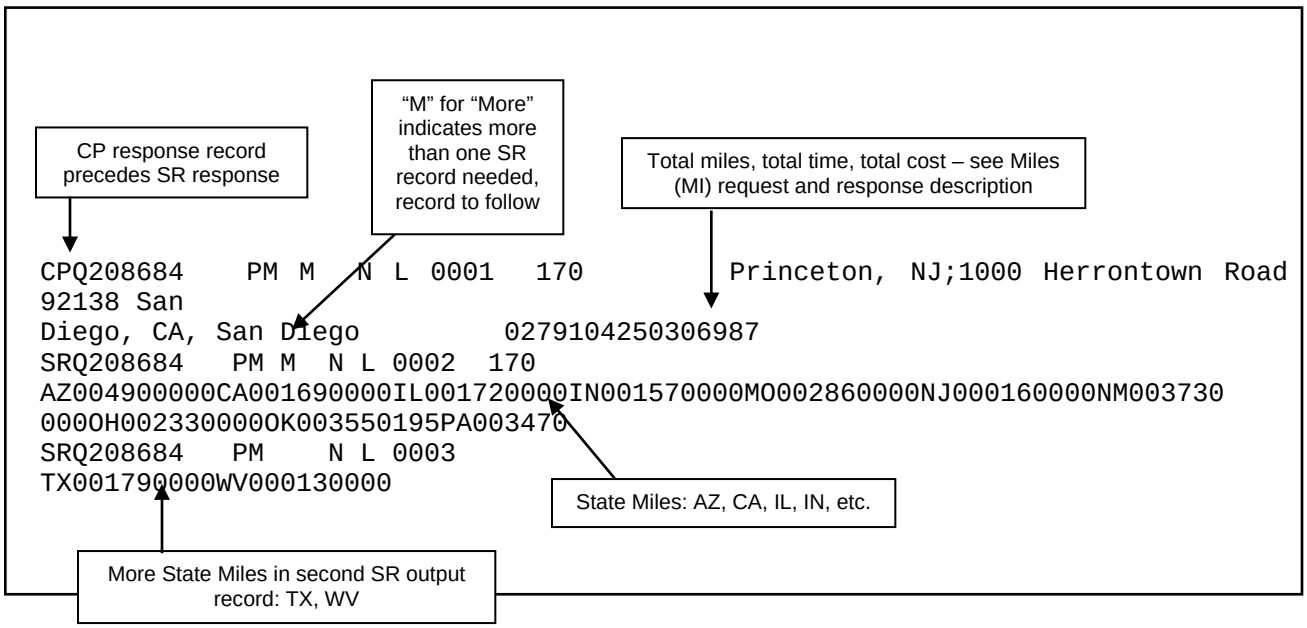
8.2.6 Sample Request and Response Records

Sample records are shown below.

Sample State Miles (SM) request record:



Sample State Miles (SR) response record:



9.0 Using the Mileage Server and Map Window

Maps are not available in PC*MILER-AS/400 Multi-Version Switch.

9.1 Menus

All menu commands in PC*MILER for the AS/400 are described on the following pages.

The File Menu

Using the **File** menu, you can open, close, save and duplicate routes; print graphics and reports; and exit the PC*MILER program.

Delete AS/400 Input Queue	When a queue becomes corrupted, creates a new queue and deletes the corrupted one.
Exit	Exit PC*MILER AS/400. When you exit, all active windows are saved as they appear on your screen for the next time PC*MILER AS/400 is opened.
AS/400 Control	Configure the mileage server for different purposes. Choose from the sub-menu: **Change Library/Queue: Location of request/input queue. Default Library is ALKMVS. Default Data Queue Name is** MIDQUE. Innovative users use your ICC work library, IE: ITRS6WORK or IESR7WORK. If you want to display routes/trucks for requests coming from this one PC rather than for all requests, use your AS/400 display name instead of MIDQUE. **Mapping on:** Not Available **Graphics for Mile Requests:** Not Available. **Log to File:** Turn diagnostics on/off. This

	is useful for debugging problems. When on, diagnostics are written to a file called as400.log, located in the directory that the software is running from (as400.exe). Choose between Append, Overwrite, and Verbose. (Verbose adds PC to AS/400 Communications messaging.) **Host Polling Timer:** Use faster time slice to poll the AS/400 more often for faster interactive response time, or slower time slice for smoother graphic display. **Force Pick List:** Turns AS/400 pick lists off/on for duplicate city names. Activates lists for both large cities with multiple ZIP codes and duplicate city names.

The Map View Menu

Not available in PC*MILER-AS/400 Multi-Version Switch.

The Window Menu

Used to control and organize the active windows in your display.

Tile Vertical	Active windows will fit your screen, running vertically.
Tile Horizontal	Active windows will fit your screen, running horizontally.
Display Serve Log	Restore the Serve Log window if minimized.

10.0 Common Questions and Installation Problems

Question: *Some of the mileage returned from PC*MILER is different from the mileage returned by my other transportation software.*

Answer: The city spelling or ZIP being used by the other software is probably not correct. To verify what place name is being sent to PC*MILER, click on the Pick Pins icon and then on the stop-off point in the mapping window. Now correct your AS/400 cities file.

Question: *When I change my queue name to "MIDQUE", my PC can't receive anything from the AS/400.*

Answer: Make sure that you exit and restart the PC*MILER interactive software on the AS/400. The PC*MILER program on the AS/400 will detect the presence of the new queue and it will send requests to this queue.

Question: *The interactive response time has become slower on the AS/400 since we have added several more users. Can we improve the performance?*

Answer: Yes. You can run multiple copies of the PC*MILER AS/400 program on the same PC if you have enough memory. Or if you have another available PC, you can start up PC*MILER AS/400 on the other PC.

Question: *How can I run PC*MILER AS/400 on more than one PC?*

Answer: Make sure that PC*MILER AS/400 is installed properly on each PC. Additionally, set the queue name to **MIDQUE** so that the multiple PCs are servicing the same queue.

11.0 Technical Support

Technical support is available to registered users of PC*MILER AS/400 from **8:00am** to **5:00pm EST**, **Monday through Friday**. Call **(609) 683-0220, ext 2**. Or e-mail us at **pcmsupport@alk.com** (type "MVS" in the subject line).

Appendix A: Backward Compatibility

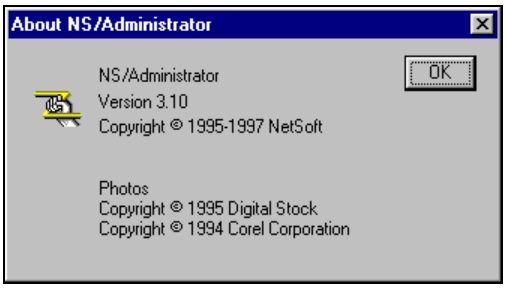
ALK Technologies does support backward compatibility with previous versions of PC*MILER and PC*MILER for the AS/400. However, it is **not** advisable to develop new applications that use these short city name structures, because you lose access to county information which is necessary for resolving duplicate city name problems. Over time, this backward compatibility becomes increasingly difficult for ALK Technologies to maintain. Future backward compatibility is not guaranteed.

If you would like more information about backward compatible formats, please contact the ALK technical support staff (see Chapter 11).

Appendix B: Configuring an N/S Router For Use With PC*MILER-AS/400

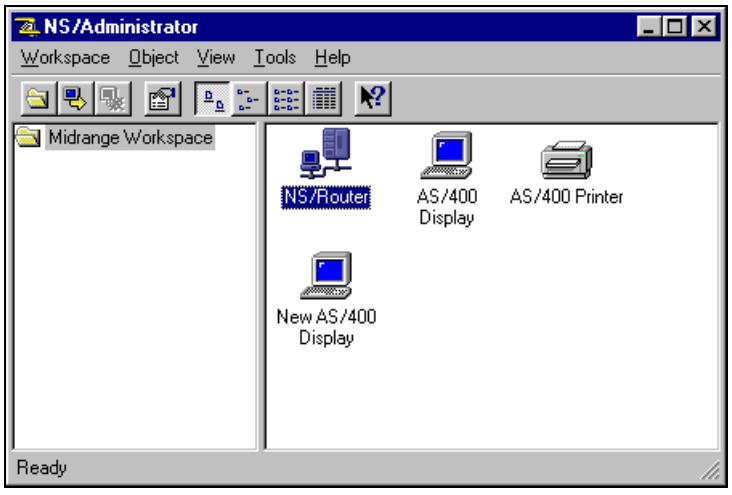
Unless you have a twinax connection, configure your router using the AnyNet protocol. AnyNet needs to be enabled on the AS/400 (see *Appendix D: Configuring AnyNet on the AS/400*).

For PC*MILER Version 14 (or higher) and any PC*MILER|Streets version, you must have the N/S Router version 3.0 or higher.



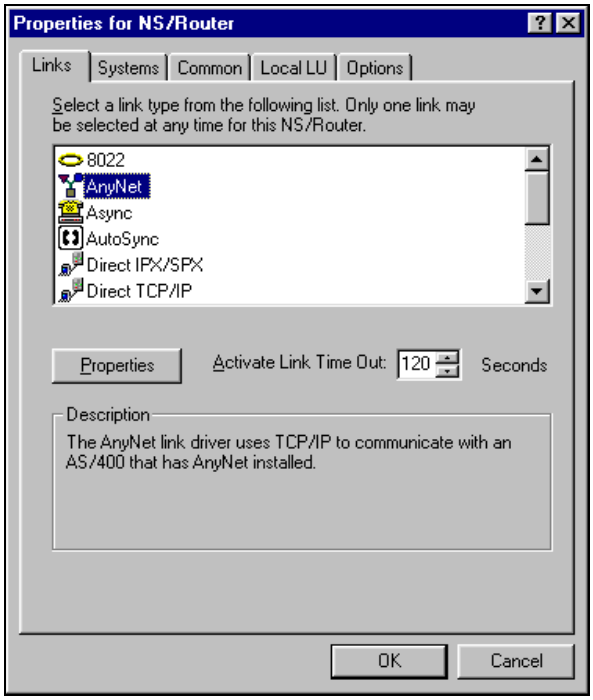
Check by selecting HELP > About in the NS/Administrator or the midrange workspace. **NOTE:** If you need to upgrade your NS Router, you must reinstall the PC*MILER AS/400 interface afterwards. The PC*MILER interface is built on a specific Netsoft Data Queue DLL that is available only on the PC*MILER interfaces CD.

To start the configuration, go to the N/S Administrator, right-click on the N/S Router, and choose Properties.

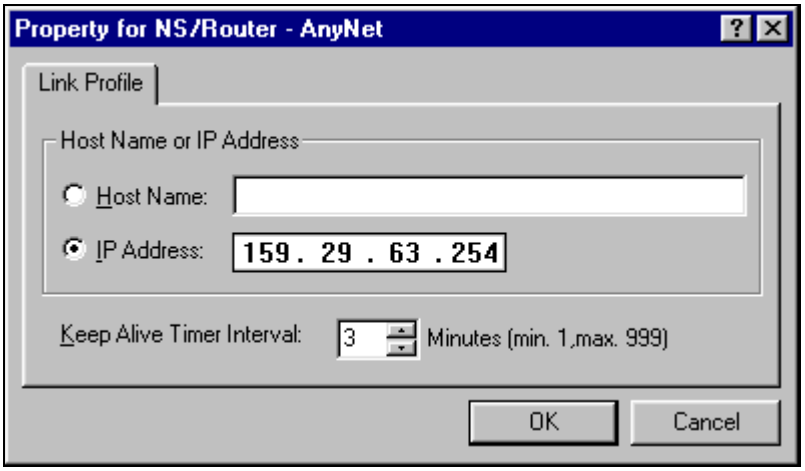


Then do the following:

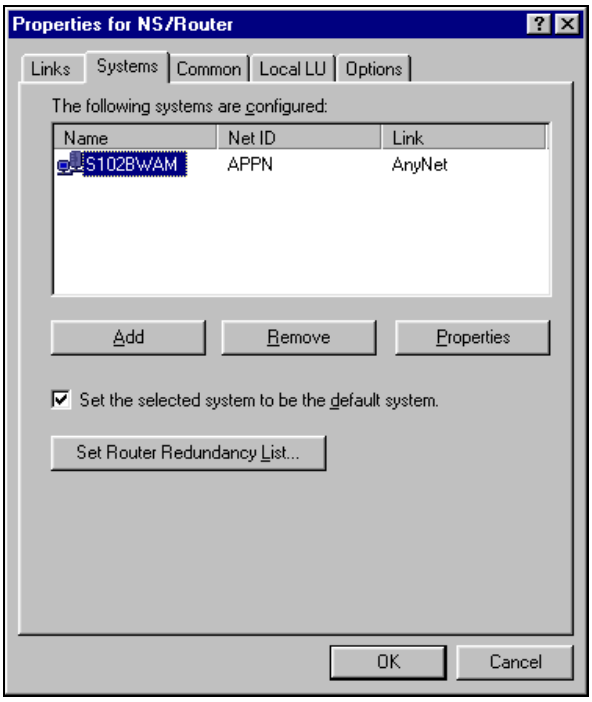
1. In the Links Tab, highlight AnyNet, and then choose Properties.

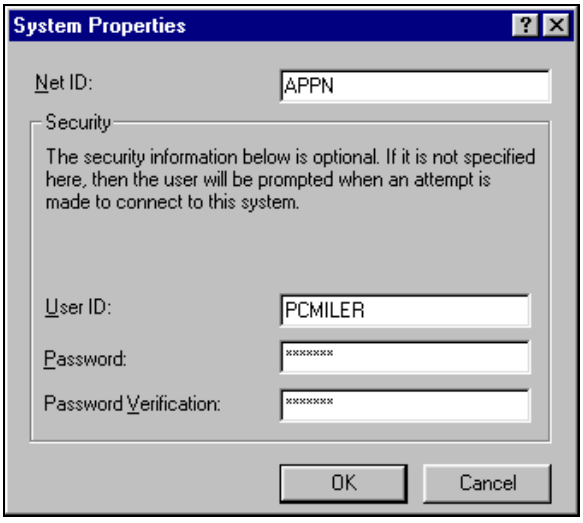


2. In Properties, fill in the AS/400's IP address. You can use a system name, but if your host tables are not filled in properly, you will be able to connect to the AS/400, but PC*MILER won't be able to create a Data Queue.

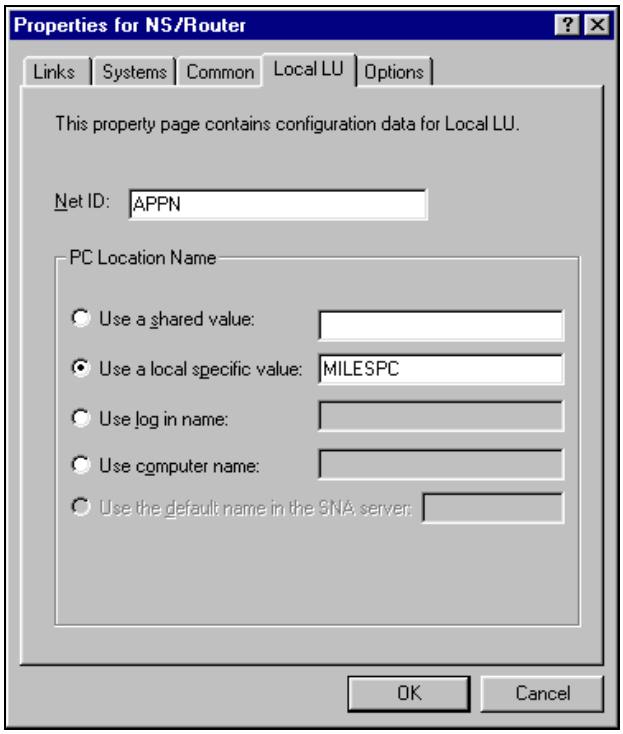


3. The Systems tab adds the AS/400's system name. This is where you set the password with which the router signs in. Make sure that the password has not expired, and that the account has object authority to the library where your mileage request Data Queue will reside (usually **ALKMVS** or an Innovative Work Library).





4. In the local LU tab use the second option, **Use a local specific value**.



These are the only changes you need to make. Leave the other settings on the defaults.

Appendix C: Configuring AnyNet On the AS/400

The following instructions are provided by NetManage.

1. Type the following command at the AS/400 command prompt:

   CHGNETA ALWANYNET(*YES)

   This value can only be changed when the AnyNet controller is varied off. Vary on the controller to make the change effective. You can check this attribute with the **DSPNETA** command, and page down to the bottom.

2. Type the following command at the AS/400 command prompt:

   CRTCTLAPPC CTLD(controller name) LINKTYPE(*ANYNW)
   RMTCPNAME(same as controller name)
   RMTNETID(*NETATR)

   For **(controller name)**, any name can be used. Only create one AnyNet controller per 255 users. ***If multiple AnyNet controllers are created, unpredictable results may occur.***

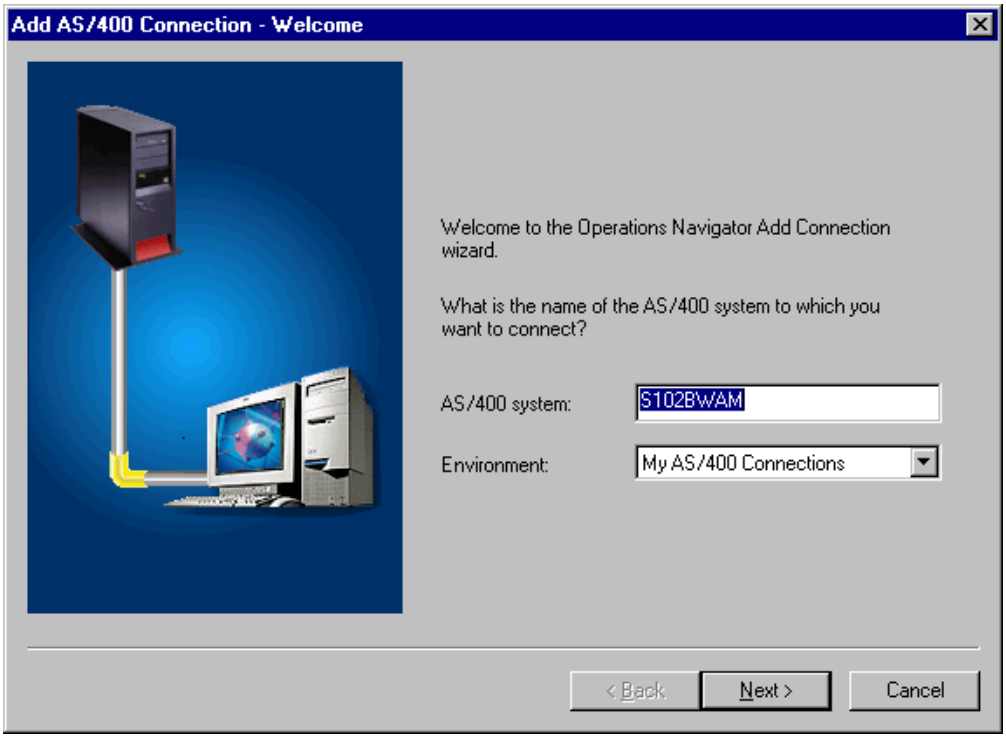
For any further questions, see your AS/400 System Administrator's *User's Guide.*

Appendix D: Configuring Client Access Express For PC*MILER-AS/400

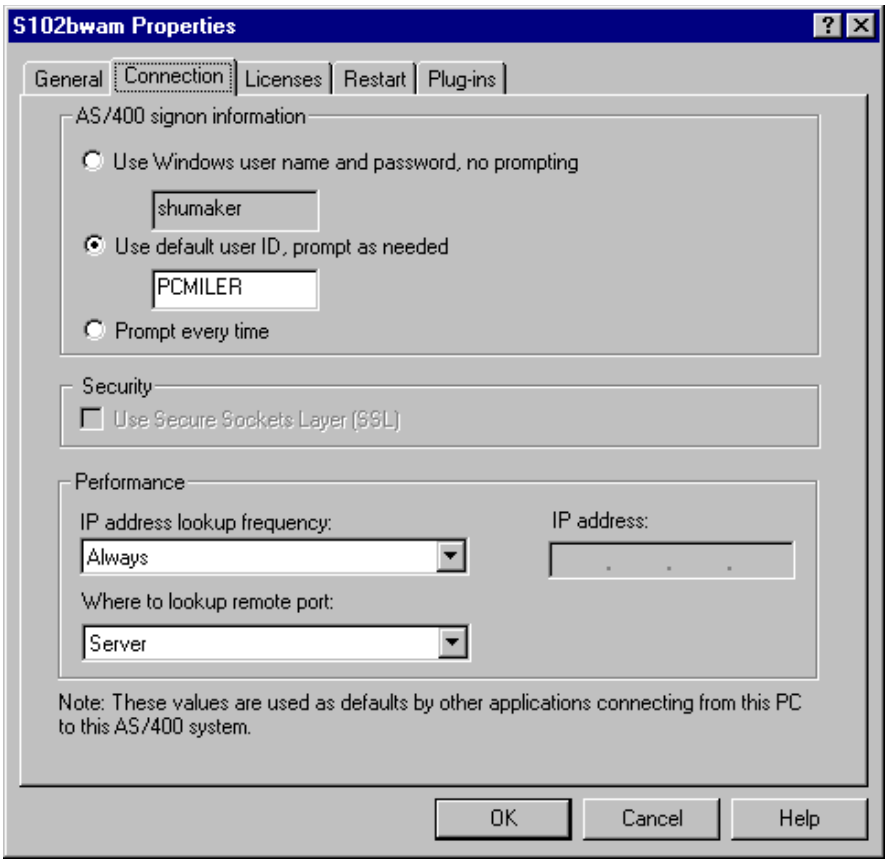
1. Install Client Access Express on your mileage server PC by running the **setup.exe** that is in the Express folder on your Client Access Express CD.

2. Go to the AS/400 Operations Navigator. For new installations, the Navigator will prompt to ask if you want to add a connection. You will need to know the IP Address of your AS/400 and the System Name if you want to configure your connection using the AS/400 System name. You will have to make a table entry in the PC's Hosts File. For NT or Windows 2000, the file is **C:\winnt\system32\drivers\etc\hosts**. For 95/98, **c:\windows\hosts.sam**.

   Here we are adding an AS/400 called **S102BWAM**, you can also use the IP address of your AS/400.



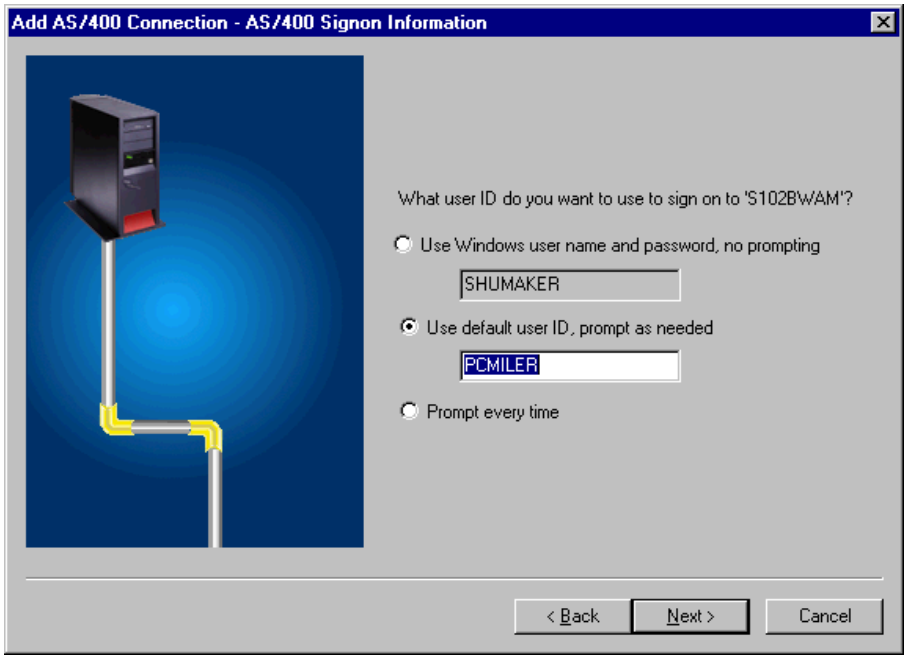
For existing installations of Client Access Express, go into the AS/400 Operations Navigator and right mouse click on your AS/400 connection. Choose Properties to make changes or Verify to verify a connection.



The Connection Properties Window is used for changing existing connections or changing the Restart Settings for new connections.

NOTE: Client Access Express has the ability to change passwords in the user profile. If you are prompted for a new password, you will be making a permanent change in that user profile.

3. **Password Considerations -** There are several areas to consider with a Client Access Express installation. Client Access Express offers three Password options. You can choose to have the PC logged on manually to the AS/400, have Client Access Express use the Windows User Name and Password, or you can specify a user profile and have the password typed in as needed.

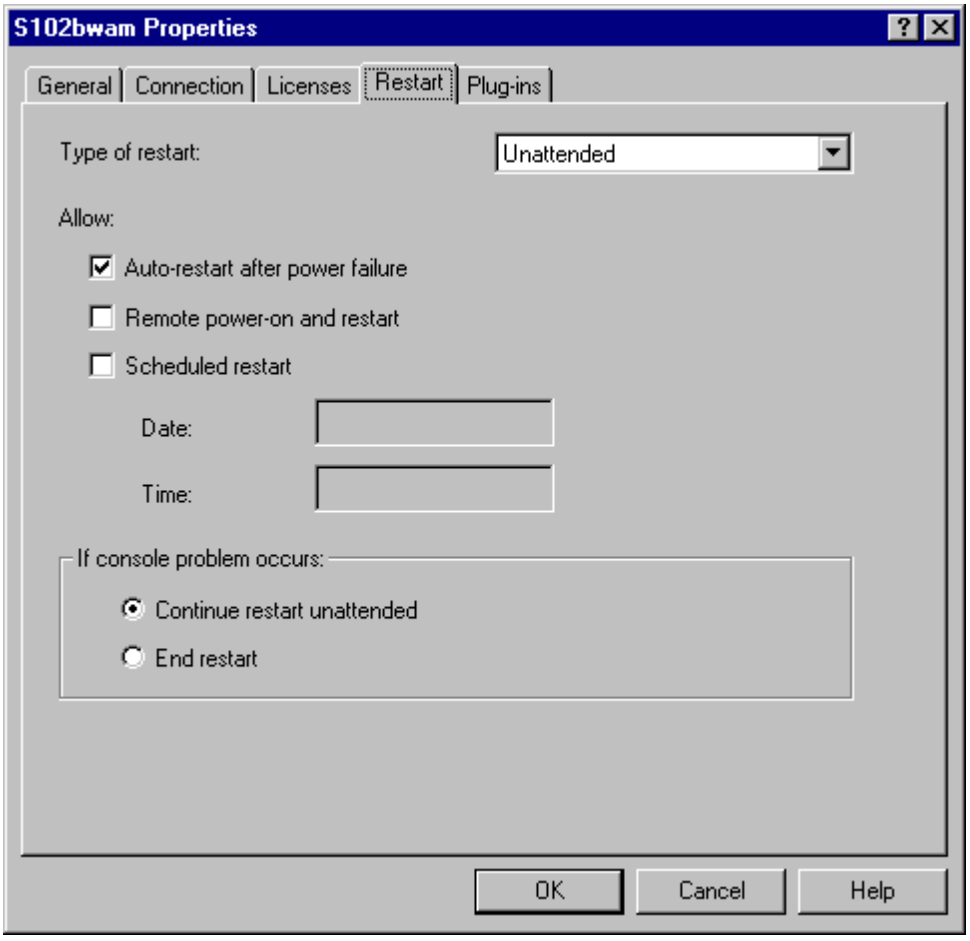


The default user ID is the User Profile that the mileage server PC will be signing on to. This user will need the authority to create and delete data queues in either the ALKMVS Library or your Innovative Work Library.

If you choose to use the Windows User and Password, you have to have the Windows User Name and Password match the user profile and Password that you will be using for your mileage server PC to sign onto the 400 with. The Windows User and password must exactly match those in the user profile you are using.

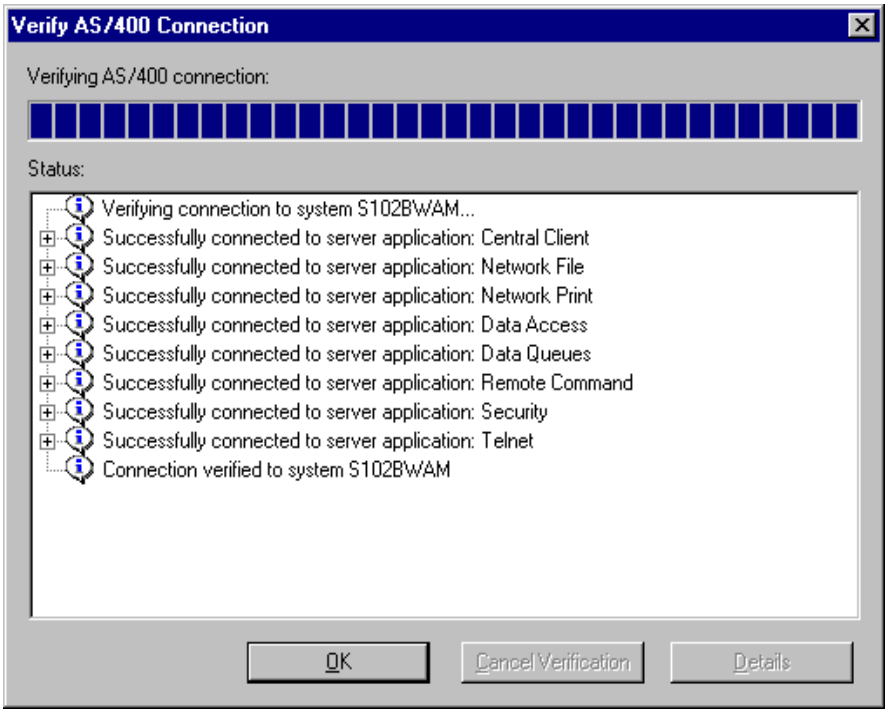
In the event of a power loss, the PC will not connect to the AS/400 until someone manually types in the Windows password. To get a PC to restart without prompting for a password, you have to set the Windows Password to nothing. AS/400 security does not allow a null password. So if you want the mileage server PC to reconnect automatically after a power outage, you cannot use the Windows Password option.

If you want to have an unattended restart, your only option with Client Access Express is to store the User Profile Name and Password in the mileage server's .ini file. At this time, the password is not encrypted, but it is stored as text.



For auto-restart, you will also have to make the above settings in the Connection Properties dialog. (For new connections, right mouse click on your connection in the AS/400 Operation Navigator, and choose properties to get this screen.)

4. **Verify the connection**. If a connection cannot be made, contact IBM for assistance.



Appendix E: The Sleep Feature For IPL Drop Outs

The Sleep Feature has been added to correct an issue in which the NS Router does not reliably reconnect to the AS/400 after an IPL or power down.

This feature can also be used in the rare cases where client Access Express loses connection after an IPL.

To activate the sleep feature, you need to send a message to the PC mileage server (**as400.exe**).

Included in your ALKMVS Library is a CL program called "queue". For queue to work you must have **ALKMVS** in your library list. You may have to compile the queue if you do not have the program – use the command **WRKOBJPDM**, with 12 on QCLSRC and 14 on queue.

The syntax for queue is:

Queue<space>**('SP60')**

where 60 is the number of seconds that you want the mileage server to sleep for.

NOTE: Queue is case sensitive, the SP has to be in caps.

To put the mileage server to sleep for a 3-hour period before an IPL, you would have to run this command (with ALKMVS in your library list):

Call ALKMVS/queue<space>**('SP10800')**

The sleep process only works if the only thing using the NS Router is one mileage server. You can't be running Netsoft Green Screens, or more than one mileage server. The sleep feature sends a message to the NS Router to disconnect its conversations with the AS/400. The sleep command can only disconnect its own connections, having other active connections causes the process to fail.

You will need to test the sleep feature. On your mileage server, set up your screen so you can watch both the Router (Midrange Workspace) and the mileage server's Server Log (SRV32.exe).

To get the Midrange Workspace up, double-click the small overlapping white & purple squares icon that resides by the system clock. You can also press and hold down the ALT key and press and release the TAB key until the Midrange Workspace NS/Router Icon is selected, and then release both keys.

To get the AS/400 mileage server screen, you can click on SRV32 on your tool bar. You can also press and hold down the ALT key, and press and release the TAB key until the AS/400 Server – PC*MILER icon is selected, and then release both keys. To bring up the Server Log, click on the mileage server window's pull-down menu, or press ALT-W and choose Display server Log.

From a green screen on another PC or terminal, run PC*MILER and run a route from 10001 to 90009 to make sure that it is working. Watch the PC*MILER AS/400 Server's server log. You should see those ZIP codes show up in a line that starts out "**input=…**" This test is to ensure that you are working with the correct mileage server, and that it is working properly.

Now exit the green screen PC*MILER and send a 60-second sleep command:

Call queue<space>**('SP60')** press **<ENTER>**.

Watch the server log to see that it catches the sleep message. Also watch in the Midrange Work Space that the number of conversations drops to zero. Finally, the mileage server should wake up and reconnect with the mileage server; the number of conversations in the Midrange Work Space should go up to 2.

Now go back to the green screen PC*MILER and send another mileage request to test that the re-established connection is working properly. If it is working now, you can use this feature before your ipl's or power downs.

Be sure to put it to sleep for a long enough period of time. If the mileage server wakes up too early (before the AS/400 is back up) it won't be able to connect. Be sure to leave enough time between sending the sleep command and starting the ipl or power down. The mileage server needs time to disconnect the router before the router senses the AS/400 dropping out or the process fails.

Appendix F: Multi-Version Switch INI Settings

PC*MILER-AS/400 Multi-Version Switch uses multiple INI files.
AS400.exe uses Srv32.INI and Pcmmv.INI.
Each instance of PC*MILER|TCP/IP uses its own Pcmserve.INI.

Srv32.INI is used for startup information. Pcmmv.INI is used to store the locations of your various instances of PC*MILER|TCP/IP.

Srv32.INI and Pcmmv.INI have to be kept in synch at all times. Changes to the values under the [MultiVersion] Key in Srv32.INI have to be mirrored in Key names in Pcmmv.INI.

NOTE: Maintain case sensitivity, when editing your pcmmv.ini do not alter 'PCMiler'.

For example, from Srv32.INI:
[MultiVersion]
Product0=PCMiler 160 ← Maps to [PCMiler 160] in Pcmmv.INI
Product1=PCMiler 170 ← Maps to [PCMiler 170] in Pcmmv.INI
Product2=PCMiler 180 ← Maps to [PCMiler 180] in Pcmmv.INI
Product3=PCMiler 190 ← Maps to [PCMiler 190] in Pcmmv.INI

In Pcmmv.INI:
[default]
product=PCMiler 160← This must match one of the Products listed above.

The default instance of PC*MILER|TCP/IP is only used if a mileage request has no version specified (blanks in MVS parameter). An error will be returned for any other invalid version request.

SRV32.INI Explained

[Defaults]
; Default values: valid values are listed after the description
; Leave values blank to use the following internal defaults:
; CalcType=Practical ← Route Type
; Units=Miles ← Distance Units Miles or Kilometers
; ChangeDest=TRUE ← Route Through All on Trip Resequence
; HubMode=FALSE ← Lock in Hub mode. (Use with Caution)
; AlphaOrder=TRUE ← List States alphabetically vs. driving order in reports.
; IP Address or System Name of AS/400
system=
;User Profile

user=
;Password
pass=express
library = ALKMVS or ALKMTL <Location of request Queue (Midque) and Temporary Response Queues>
qname = MIDQUE

PICKLIST = FALSE ← Force Pick list for cities with multiple zip codes and for partial matches
SLEEPTIME = 300 ← Used for NS Router Connects during IPL's
FrameTrip = FALSE ← Not used
DIAG =TRUE ← Turn on logging
Borders =FALSE ; ← False Cross International Borders only for International Stops
Timer = ← Time between reads of request queue.
Mapping = FALSE ←Not Supported
ExpMap = ←Not Supported
ExitWin = ←Not Supported

[Options]
CustomRoute = ←Obey Avoids/Favors and Restriction Overrides set in pcmwin32.exe.

[Default]
Region=NA
ProductName=MultiVersion AS400
ProductVersion=1.0

; Must Point to the location of pcmmv.dll
DLLPath=C:\alkmvs or C:\Alktoll

[MultiVersion]
; Values Here Must Match Key Names in PCMMV.INI
; Values Must Be Formatted as
; Name<space>###
; Where ### is 040 for Streets 4.0 and as follows
; 140 141 150 151 160 161 170 171 et cetera

Product0=PCMiler 140
Product1=PCMiler 150
Product2=PCMiler 160
Product3=PCMiler 170

NOTE: The product count must be consecutive. You cannot comment out Products without renumbering the product counts.

The PCMSERVE.INI

Each instance of PC*MILER|TCP/IP has its own **pcmserve.ini** file in that version's ..\Tcpip folder. Values specified in pcmserve.ini will be used unless they are otherwise specified in the mileage request packet (included at the bottom of the chart).

These values will only be used if they are not specified by the calling application. Valid values for default and option settings in the pcmserve.ini that can be changed by the user are described below.

KEY	Valid Values	Description
[Logging]		
Enable=	0 1	Should log files be generated (1) or not (0). Default = 0 See more details at the end of this section.
File=		Path/file name of log file.
Append=	0 1	Append to old file (1) or write over (0). Default = 0
MaxStrLen=	Any integer up to 254	Assign number of characters to truncate log messages to (optional)
DisplayTime=	0 1	When DisplayTime = 1, date and time are shown at the beginning of each line in the specified log file.
MultiThread=	0 1	When set to = 1, the log will contain thread IDs to show the APIs executed on each current running thread. Default = 0.
[Defaults]		
CalcType=	Practical Shortest National* AvoidToll Air FiftyThree*	Set the default routing type: most Practical, Shortest by distance, favor National Network highways, avoid tolls, Air (straight line), or 53' Trailer. Default = Practical * In V.30 and higher, these route

		types have been combined into one "State + National Network" – use "National". **Note:** Toll-Discouraged, National, and 53' routing are all based on Practical miles. When 53' Trailer routing is selected, the National Network is automatically included – but not necessarily vice versa.
Units=	Miles Kilometers	What unit of measure should distance be shown in. Default = Miles
ChangeDest=	TRUE FALSE	When optimizing the route, should the trip's destination be optimized also (T). Default = False
Borders=	TRUE FALSE	Should the engine try to keep routes within the United States (F), or can they cross and recross the borders at will (T). Default = True
HubMode=	TRUE FALSE	Calculate the routes from the origin to each stop (T), not through each stop (F). Default = False
AlphaOrder=	TRUE FALSE	List the states in the State Report in alphabetical order (T) or in the order driven (F). Default = True
FerryMiles=	TRUE FALSE	Use ferry distances in mileage and cost calculations (T), or don't use (F). Default = True
LightVehicle=	TRUE FALSE	Should the DLL use Light Vehicle routing (*if Streets data is installed).* Default = False

[Options]

CustomRoute=	TRUE FALSE	Should PC*MILER|Connect use Custom routing. Default = False
HazRoute= *(only with the PC*MILER|Hazmat add-on)*	None General* Explosive Inhalant Radioactive Corrosive** Flammable HarmfultoWater	Hazardous material routing types for **North America** are: none (hazmat routing disabled), general, explosive, inhalant, radioactive, corrosive, or flammable. For **Europe or Oceania**, hazmat route types are: none, general, explosive, flammable, or harmful to water. Default (all regions) = None * "General" = "Other" in the PC*MILER GUI for v29 and higher, but they are the same route type and algorithm. ** In V.22 and earlier, this route type was named "Caustic".
PartialCityMatch=	TRUE FALSE	Enables the return of a city match on a partial match of up to 28 characters. Default = False
HistoricalRoadSpeeds=	TRUE FALSE	Toggles activation of traffic data. Equivalent to the "Traffic Enabled" option in PC*MILER. Default = False
TranslateAlias=	TRUE FALSE	This setting pertains to geocoding in PC*MILER|FuelTax. It changes "*" and "()" in a custom place name to a "Zip-City-State; Address" format.
UseUSPostCodes=	TRUE FALSE	When set to TRUE, if a 5-digit postal code might be a U.S. or a Mexican code, the U.S. code will be used. Default = True *(see note below)*
UseMexPostCodes=	TRUE FALSE	When set to TRUE, if a 5-digit postal code might be a U.S. or a

		Mexican code, the Mexican code will be used. Default = False **NOTE:** If `UseUSPostCodes` and `UseMexPostCodes` are both FALSE, or not in the INI, the default U.S. code will be used. Also see IMPORTANT NOTE for `PCMSLookup` in section 3.7.
UseStreets= *(only if Streets data is installed with PC*MILER)*	TRUE FALSE	Should street-level (T) or highway-only (F) routing be used when stops are city names or postal codes. Default = False
UseNLAbbrevInMX	TRUE FALSE	When set to TRUE, the "NL" abbreviation geocodes to Nuevo Leon in Mexico.
CountryAbbrevType=	FIPS ISO2 ISO3 GENC2 GENC3	For PC*MILER|Worldwide, this option sets the country code format that will be accepted when using city name/country abbreviations as locations in regions other than North America. Default = FIPS
DistancePrecision=	Tenths Hundredths Thousandths	Sets the number of decimal places that will be returned when distances are calculated. Default = Tenths
[ConnectOptions]		
AvoidFavorAutoSave=	TRUE FALSE	(PC*MILER|Connect) This option can be set to TRUE to autosave avoids/favors on shutdown. Default = False (Note: when this line is not present, default = false)
GeofenceAutoSave=	TRUE FALSE	(PC*MILER|Connect) This option can be set to TRUE to autosave geofence data on shutdown. Default = True (Note: when this line is not present, default = false)

[Defaults]

Region=	NA SA Africa Asia Europe ME Oceania	Default region is NA (North America). Other regions are available worldwide with PC*MILER|Worldwide.
ProductName=	PC*MILER	
ProductVersion=	31.0	Current version of PC*MILER.
DLLPath=	Usually C:\ALK Technologies\ PCMILER31\app	Path to the current installation of PC*MILER.

New for Version 25: Mexican Postal Codes

The following settings may be added to the INI [Options] section:

UseUSPostCodes=FALSE
UseMexPostCodes=FALSE

Here is the behavior associated with each setting combination:

- UseUSPostCodes=FALSE and UseMexPostCodes=FALSE – Defaults to U.S. ZIP, no routing to Mexican Postal Codes
- UseUSPostCodes=FALSE and UseMexPostCodes=FALSE – same as above
- UseUSPostCodes=FALSE and UseMexPostCodes=FALSE – Defaults to U.S. ZIP, must pass Estados code with Mexican Postal Code (e.g. "50510,EM")
- UseUSPostCodes=FALSE and UseMexPostCodes=FALSE – Only Mexican Postal Codes available, in U.S. use only city-state pairs (e.g. "Chico,CA")

New for Version 25 and Higher Logging:

[Logging]
Enable= 1 for on, 0 or blank for off
File=C:\temp\pcmmvlog.txt <=Folder must exist
Append= 1 for append, 0 for overwrite

[PCMiler 140]
address=127.0.0.1 ← IP Address of Computer Name
port=8140 ← Port Number specified when PC*MILER|TCP/IP was started.

[PCMiler 150]
address=127.0.0.1
port=8150

[PCMiler 160]
address=127.0.0.1
port=8160

[PCMiler 170]
address=127.0.0.1
port=8170

et cetera

[default] ← Used if PCMSOpenServer is called.
product=PCMiler 150

Appendix G: AS400.LOG Error Codes

To create a log file of all mileage server input and outputs, click on the mileage server's **File** menu>**AS/400 Control** and choose **Log to file**. The file created is **C:\ALKMVS\as400.log** or **C:\ALKTOLL\AS400.log**. **AS400.log** displays requests and responses in the exact format as they are received and sent by the mileage server. It is recommended that logging only be used for diagnostic purposes, as the log files get quite large.

PC*MILER Error Codes:

Error Codes	Value	Message
PCMS_INVALIDPTR	101	Invalid pointer
PCMS_NOINIFILE	102	The INI file was not found
PCMS_LOADINIFILE	103	Could not load the INI file
PCMS_LOADGEOCODE	104	Could not load location database
PCMS_LOADNETWORK	105	Could not load the network database
PCMS_MAXTRIPS	106	Too many open trips (limit of 8)
PCMS_INVALIDTRIP	107	Invalid trip ID
PCMS_INVALIDSERVER	108	Invalid server ID
PCMS_BADROOTDIR	109	Could not find RootDir setting in INI file
PCMS_BADMETANETDIR	110	Invalid PCMNetDir setting
PCMS_NOLICENSE	111	License infraction: too many users, or licenses not found
PCMS_TRIPNOTREADY	112	The trip is not ready to calculate
PCMS_INVALIDPLACE	113	Invalid place name (city, state not found)
PCMS_ROUTINGERROR	114	Calculation failed: portions of trip are invalid
PCMS_OPTERROR	115	Optimization failed: portions of the trip are invalid
PCMS_OPTHUB	116	Cannot optimize a trip in HUB mode
PCMS_OPT2STOPS	117	Not enough stops to optimize the trip
PCMS_OPT3STOPS	118	Not enough stops to optimize without changing destination
PCMS_NOTENOUGHSTOPS	119	Not enough stops to calculate the trip
PCMS_BADNETDIR	120	Bad network directory
PCMS_LOADGRIDNET	121	Error loading gridded network
PCMS_BADOPTIONDIR	122	Bad option directory
PCMS_DISCONNECTEDNET	123	Disconnected network
PCMS_NOTRUCKSTOP	124	Truck inaccessible stop
PCMS_INVALIDREGIONID	125	Invalid region ID
PCMS_CLOSINGERROR	126	Server did not shut down properly
PCMS_NORTENGINE	127	Server could not properly initialize internal routing component
PCMS_NODATASERVER	128	Server could not properly initialize internal routing component

PC*MILER|Streets Error Codes:

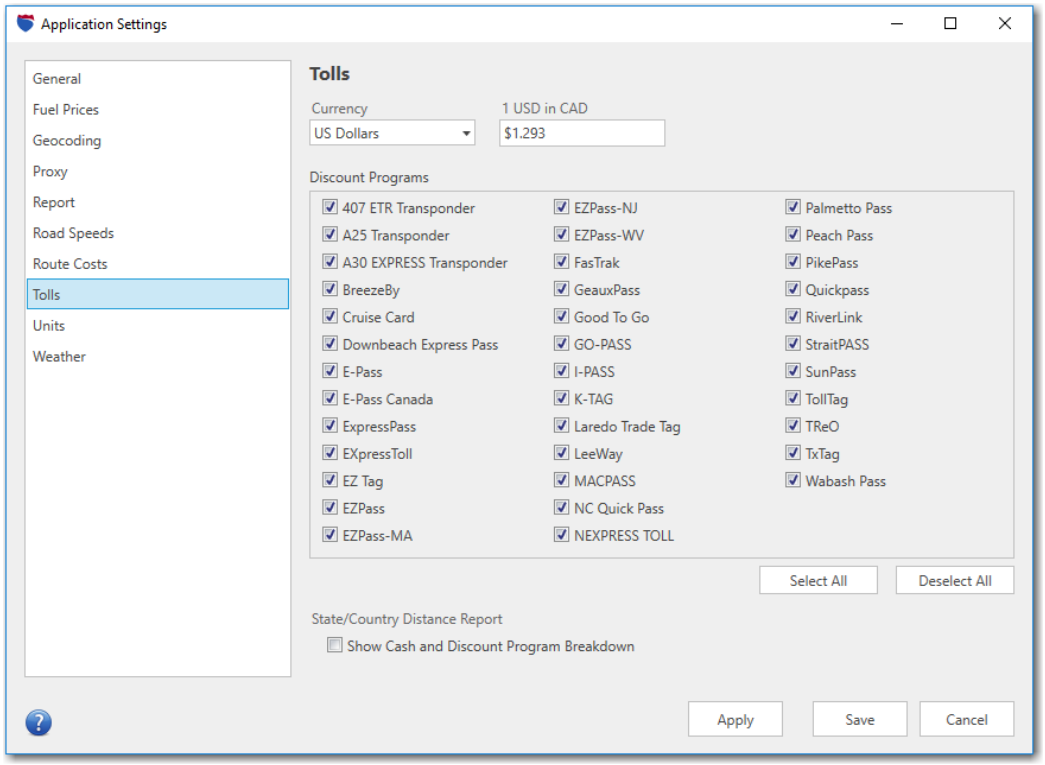
Error Codes	Value	Message
PCMS_INVALIDPTR	101	Invalid pointer
PCMS_NOINIFILE	102	The INI file was not found
PCMS_LOADINIFILE	103	Could not load the INI file
PCMS_LOADGEOCODE	104	Could not load location database
PCMS_LOADNETWORK	105	Could not load the network database
PCMS_MAXTRIPS	106	Too many open trips (limit=8)
PCMS_INVALIDTRIP	107	Invalid trip ID
PCMS_INVALIDSERVER	108	Invalid server ID
PCMS_BADROOTDIR	109	Invalid RootDir setting in INI file
PCMS_BADMETANETDIR	110	Invalid MetaNetDir setting in INI file
PCMS_NOLICENSE	111	License infraction: too many users, or licenses not found
PCMS_TRIPNOTREADY	112	The trip is not ready to calculate
PCMS_INVALIDPLACE	113	Invalid place name (city, state not found)
PCMS_ROUTINGERROR	114	Calculation failed: portions of trip are invalid
PCMS_OPTERROR	115	Optimization failed: portions of the trip are invalid
PCMS_OPTHUB	116	Cannot optimize a trip in HUB mode
PCMS_OPT2STOPS	117	Not enough stops to optimize the trip
PCMS_OPT3STOPS	118	Not enough stops to optimize without changing destination
PCMS_NOTENOUGHSTOPS	119	Not enough stops to calculate the trip
PCMS_BADNETDIR	120	Bad network directory
PCMS_LOADGRIDNET	121	Error loading gridded network
PCMS_BADOPTIONDIR	122	Bad option directory
PCMS_DISCONNECTEDNET	123	Disconnected network
PCMS_NOTRUCKSTOP	124	Truck inaccessible stop
PCMS_INVALIDREGIONID	125	Invalid region ID
PCMS_CLOSINGERROR	126	Closing error

Appendix H: Setting Toll Discount Program Membership

Toll Discount membership is set on your PC mileage server. Changes are made within the desktop PC*MILER|Tolls program (for example, c:\ALK Technologies\ PCMILER31\app\ pcmwin32.exe).

On your mileage server PC:

1. Click Start → Programs → PCMILER 31 → PCMILER 31 (pcmwin32.exe).
2. Click the File menu → Application Settings → Tolls.
3. Check or uncheck the appropriate boxes as pictured below.
4. Click "Save" and close the dialog.
5. Exit pcmwin32.exe.



After making changes to your Discount settings and PC*MILER|Tolls, you must shut down and restart your mileage server (as400.exe):

The AS400 Interface (as400.exe) only reads optional settings at Startup.

Appendix I: Renamed Program Objects

Some MVS objects in PC*MILER-AS/400 and PC*MILER|Tolls-AS400 are modified versions of the ones in the standard PC*MILER|Connect-AS/400 version. The following objects have been renamed to avoid conflicts with existing PC*MILER products. **NOTE:** Some objects have been renamed twice to adhere to an updated naming policy.

ALKWIN Library => ALKMVS
ALKWIN/Miinqc => ALKMVS/MVSIINQ (RPG Mileage Inquiry Program)
ALKWIN/Miinqc => ALKMVS/MVSIINQQC (CL program rhat creates a response data queue and then calls ALKMVS/MVSIINQ)
PCMILER Cmd => PCMVS Cmd (Calls ALKMVS/MVSIINQ)
ALKWIN/GETQNAME => ALKTLL/GETQNAMTL (RPG Program that checks for user customized requests data queues)

External Data Structures
Used for sending and receiving trip information to/from data queues.
ALKWIN/MISEND => ALKMVS/NWSEND => ALKMVS/MVSEND
ALKWIN/MIRESP => ALKMVS/NWRESP => ALKMVS/MVRESP
ALKWIN/DRAW => ALKMVSL/MVDRW
ALKWIN/PLRESP => ALKMVS/MVPLRS

Print File
ALKWIN/MIINQPF => ALKMVSL/MVINQPF

Stop (City) Validation
ALKWIN/CITALK => ALKMVS/CITMVS (RPG program that parses user input and calls VTLADR for PC side validation)
ALKWIN/VALADR => ALKMVS/MVVADR

Saved Routes (Turn by Turn Instructions) and Trips
ALKWIN/ROUTES => ALKMVS => RTESMV (Saved Directions)
ALKWIN/STOPS => ALKMVS/STPMV (Saved Trips)
ALKWIN/LOADST => ALKMVS/LOADMV (RPG Program Loads Saved Trips)
ALKWIN/SAVEST => ALKMVS/SAVEMV (RPG Program Saves Trip)

Storage of Trip Parameters
ALKWIN/COMALK => ALKMVS/COM (Data Area for storing startup Trip Parameters)
ALKWIN/Config => ALKMVS/MVSFIG (Program for setting Trip Parameters)

Display Files
ALKWIN/CONFIGD => ALKMVS/MVSFIGD
ALKWIN/MINQD => ALKMVS/MVSINQC
ALKWIN/STOPSD => ALKMVS/STPMVD
ALKWIN/SAVESTD => ALKMVS/SAVEMVD
ALWIN/VALHLPD => ALKMVS/VALHMVD

For PC*MILER|Tolls:

Tolls:
AlKWIN library => ALKMVS => ALKMTL
ALKWIN/Miinqc => ALKMTL/MVTIINQ (RPG Mileage Inquiry Program)
ALKWIN/Miinqc => ALKMTL/MVTIINQ (CL program that creates a response data queue and then calls ALKMTL/MTLIINQ)
PCMILER Cmd => PCMTL Cmd (Calls ALKMTL/MTLiinqc)

External Data Structures
Used for sending and receiving trip information to/from data queues.
ALKWIN/MISEND => ALKMTL/NWSEND => ALKMTL/MTLEND
ALKWIN/MIRESP => ALKMTL/NWRESP => ALKMTL/MVRESP
ALKWIN/DRAW => ALKMTLL/MTDRW
ALKWIN/PLRESP => ALKMTL/MTPLRS

Print File
ALKWIN/MIINQPF => ALKMTLL/MTINQPF

Stop (City) Validation
ALKWIN/CITALK => ALKMTL/CITMTL (RPG program that parses user input and calls VTLADR for PC side validation)
ALKWIN/VALADR => ALKMTL/VMTADR

Saved Routes (Turn by Turn Instructions) and Trips
ALKWIN/ROUTES => ALKMTL => RTESMT (Saved Directions)
ALKWIN/STOPS=> ALKMTL/STPMT (Saved Trips)
ALKWIN/LOADST => ALKMTL/LOADMT (RPG Program Loads Saved Trips)
ALKWIN/SAVEST => ALKMTL/SAVEMT (RPG Program Saves Trip)

Storage of Trip Parameters
ALKWIN/COMALK => ALKMTL/COMMTL (Data Area for storing startup Trip Parameters)
ALKWIN/Config => ALKMTL/MTLFIG (Program for setting Trip Parameters)

Display Files
ALKWIN/CONFIGD => ALKMTL/MTLFIGD
ALKWIN/MINQD => ALKMTL/MTLINQC
ALKWIN/STOPSD => ALKMTL/STPMVD
ALKWIN/SAVESTD => ALKMTL/SAVEMVD
ALWIN/VALHLPD => ALKMTL/VALHMVD

Appendix J: Installing the .0 and .1 Releases of the Same PC*MILER Version

You cannot have the ".0" and the ".1" release of version 14 or 15 on the same PC because they share a common Registry Key. For example, if you need access to versions 14.0 and 14.1, you will need to install 14.0 on one PC and 14.1 on a second PC. For Version 16 and higher it is possible to run both the .0 and .1 releases on the same PC. However, doing so does complicate the installation process. Starting with the release of V24 both the .0 and .1 releases install on the same PC with no extra configuration steps.

NOTE: You must pay strict attention to the installation process or you run the risk of corrupting or overwriting existing installations. There are three areas that need attention: Shared Installation GUIDs, Default Installation Locations, and DLLPath Configuration.

NOTE Also: There are .1 specific builds of the installs available. Depending on the vintage of your software, your .1 setup.exe's and MVS self-extracting Zip files may default to a Pmwxx1 directory.
For example, Version 16.1 defaulting to Pmw161.

Shared Installation GUIDs

For Version 16.x, 17.x, and 18.x you will have to delete a reference to the previous release installation (.0 or .1) before you can install the second release.

After installing the .0 or the .1 release and before you install the second release, run Regedit.exe and delete the following keys:

V16.x
HKEY_LOCAL_MACHINE\SOFTWARE\Microsoft\Windows\CurrentVersion\Uninstall\{4C02492D-1CCE-11D6-9A57-0050DAB7B690}

V17.x
HKEY_LOCAL_MACHINE\SOFTWARE\Microsoft\Windows\CurrentVersion\Uninstall\{4F012334-1EC4-4329-80A6-2F3F15827BE7}

V18.x
HKEY_LOCAL_MACHINE\SOFTWARE\Microsoft\Windows\CurrentVersion\Uninstall\{7CCACA26-5069-4F28-9775-84BE1BA1C8E2}

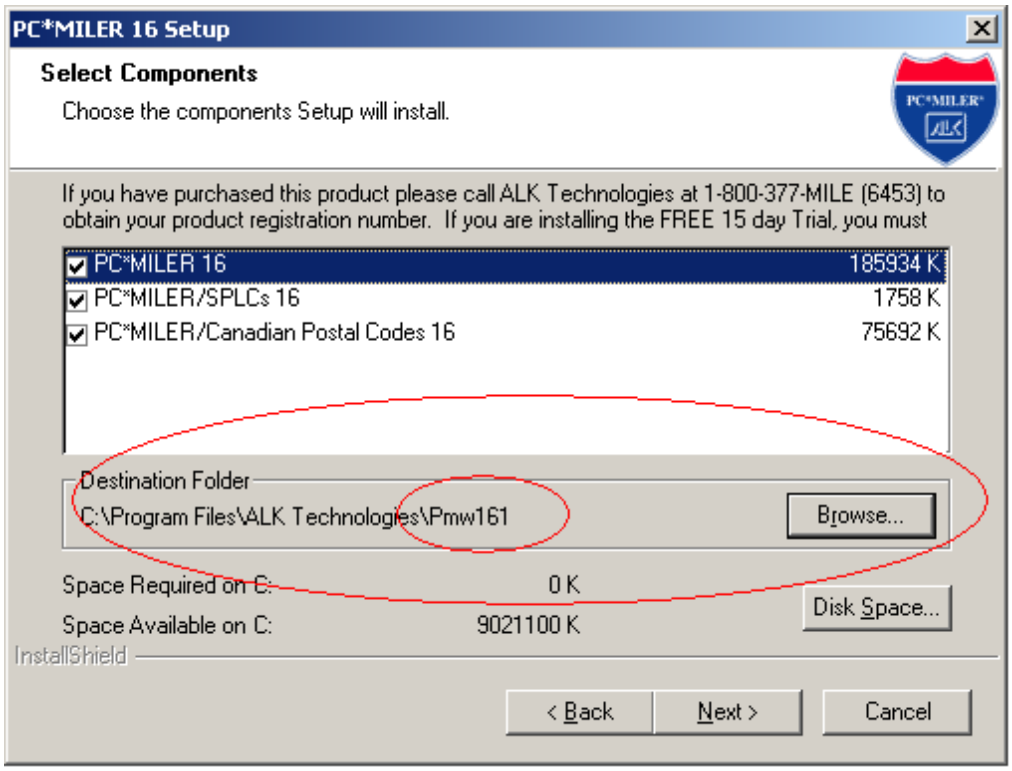
V22.x
HKEY_LOCAL_MACHINE\SOFTWARE\Microsoft\Windows\CurrentVersion\Uninstall\{E8C37439-36B9-427C-A7D5-D223C79BBC4C}

V23.x
HKEY_LOCAL_MACHINE\SOFTWARE\Microsoft\Windows\CurrentVersion\Uninstall\{BC0E8625-C6E9-4D2C-B7C9-FE615C660437}

Without deleting these keys, running the Installshield setup.exe will take you into Maintenance Mode and you will not be given the option of doing a full installation. For Versions 16 and 17 this would corrupt the installation and make it unusable. For Version 18 it would convert the existing from a .0 to a .1 or vice versa.

Default Installation Locations

During the installation process you will have to be careful to redirect the installation location away from the existing location as pictured below. Failure to do so will result in the corruption of the existing version.



Click the **Browse** button to redirect the installation.
Use Pmwxx0 for the .0 releases and Pmwxx1 for the .1 releases.

For example: Pmw230 for Version 23.0 and Pmw231 for Version 23.1.

When unzipping the MVS portions of the installations (VxxxMVS.exe, where xx or xxx is the version number), be careful that the unzip is pointing to the correct installation. Some disk sets will include VXXXcMVS.exe where the extraction is set to a Pmwxx1 folder and the DLLPath value in the resulting

pcmserve.ini is mapped to the Pmwxx1 folder. Additionally the pcmsockXX.exe file will contain a three digit version.

For versions 16 and 17, unzipping the incorrect file will corrupt the installation. Double-check that you are running the correct file for that particular release. For example, you must unzip V161Tcpip.exe and For161App.exe into a 16.1 release and not a 16.0 release.

DLLPath Configuration

If you had to adjust the "Unzip To Folder" value of the self extracting zip files, you will have to edit the DllPath= value in the Pmwxxx\TcpIp\pcmserve.ini file for that version as depicted below:

```
[Default]
DLLPath=C:\Program Files\ALK Technologies\PMW260\app
```

For Versions 18 and higher it is recommended that you rename the ..\Pmwxxx\TcpIp\pcmsockxx.exe so that you can determine the version in the Task Manager. For example, rename ...\pmw180\Tcpip\ pcmsock18.exe to pcmsock180.exe or pcmsock181.exe. You will have to edit C:\alkmvs(alktoll)\Startmvs.bat and Killmvs.bat with the changed names.

You may have to make adjustments to pcmmv.ini file as detailed in *Step 4.3* of the installation instructions in Chapter 3.

Appendix K:
Manually Adding New Versions to Existing MVS Servers

NOTE: An automated installation is available for Versions 26-31, see Chapter 3.

Adding new versions of PC*MILER to an existing MVS Server is a three-step process that is very similiar to an initial installation. You first install the desktop PC*MILER program via an Installshield setup.exe, then run a self-extracting Zip file that contains the MVS software, and finally you add the new version to your existing Killmvs.bat, PCMMV.ini, StartMVS.bat and Srv32.ini files.

Update CDs will look similiar to the following:
An MVSInst Folder containing Directions.txt, your self-extracting Zip file, any necessary patches, and a UserGuide folder containing the latest User Guide, plus a V2xx Folder which contains the lastest version's Installshield Setup. Directions.txt will contain your 25-digit product key code(s) and specific installation instructions.

NOTE: Starting with V27, you will be emailed your 25-digit product key code as custom MVS update disks are no longer being produced. There will be links within this email to Detailed Directions and Varsity Directions text files with instructions specific to your company's particular MVS installation. Varsity Directions files are abbreviated instructions for experienced MVS installers or IT professionals looking to minimize install times.

Essentially you will be copying the 25-digit product key code from the Directions.txt file or the email from alkservices@alk.com and then running the Installshield Setup.exe.

After installing the base PC*MILER, run the self extracting zip file (Version 26.1 or earlier only). Then add the new version to your configuration and batch files.

The following are examples for adding V26 to an existing MVS Server:

Killmvs.bat:

Copy/Paste a similiar entry for an existing version and edit the version number.
For example:

1. Copy ./process –k pcmsock28.exe and paste it to a new line.
2. Change 28 to 29.
3. Save and Exit.

PCMMV.ini:

Copy/Paste a similar entry for an existing version and edit the version number.

NOTE: You must maintain case sensitivity when typing 'PCMiler'.

For example:

1. Copy:
   [PCMiler 250]
   address=127.0.0.1
   port=8250
2. Then paste to three new lines and change the version number and port number as follows:
   [PCMiler 260]
   address=127.0.0.1
   port=8260
3. Save and Exit.

Startmvs.bat:

Copy/Paste a similiar entry for an existing version and edit the directory location and port number.
For example:

1. Copy:
   cd \"Alk Technologies"\PCMILER28\MVS
   start pcmsock28 PC_MILER 8280
2. Then paste to two new lines and change the folder name and port number as follows:
   cd \"Alk Technologies"\PCMILER29\MVS
   start pcmsock29 PC_MILER 8290
   (The port number must agree with the setting in pcmmv.ini above.)
3. Save and Exit.

Srv32.ini:

Copy the last product in the list and paste onto a new line below your last entry and then change the product count and the version number in the new line.
For example:

1. Copy
   Product9=PCMiler 250

2. Then paste
   Product9=PCMiler 250
   Product9=PCMiler 250
3. Edit as follows:
   Product9=PCMiler 250
   Product10=PCMiler 260
4. Save and Exit

The product count must be the next number in the sequence, you cannot have gaps. For example, you cannot have Product9 followed by Product11. Also, the value after the equals sign has to match the value between the square brackets for your new version that you added to pcmmv.ini above.

For example:
[PCMiler 260] from Pcmmv.ini must match Product10=PCMiler 260
PCMiler 260 must match PCMiler 260 (case sensitive)

After editing your four files, run killmvs.bat, then startmvs.bat to make the new version available to your AS/400 users.

Appendix L: Four Levels of Logging (New in Version 25)

Starting with V25: Logging has been added to the pcmmv.dll and to the pcmsockxx.exe layers in addition to the existing logging at the AS400.exe (Bart) and pcmsrv32.dll/pcmserve.ini levels.

AS400.exe connects to pcmmv.dll, which connects to the version-specific instances of pcmsockXX.exe, which in turn connect to their version-specific instances of pcmsrv32.dll.

Logging should be used only during trouble shooting as the files can grow quite large.

AS400.exe Logging is turned on within the PC Distance Server (AS400.exe ((Bart)) by clicking the File drop-down menu and choosing **AS400 Control** then **Log to File** and then a choice of **Overwrite**, **Append**, or **Verbose**.

Overwrite will create a new file called "as400.log" in your ALKMVS or ALKToll folder. Use Overwrite when troubleshooting data is being received on the AS400 side.

Append will create a new as400.log file or start logging on the bottom of an existing file. Use Append for issues with AS400.exe crashes.

Verbose will create a new as400.log file or start logging on the bottom of the existing file and will include PC to AS400 communication return codes and low level internal trip information. Use the Verbose setting for troubleshooting PC to AS400 communication failures.

Pcmmv.dll logging is turned on in your pcmmv.ini file. Add the following to your pcmmv.ini in Notepad (Pcmmv.ini is typically found in C:\Alkmvs or C:\Alktoll):

[Logging]
Enable=0 off 1 on
File=C:\temp\Pcmmv.txt <=Folder must exist
Append=1 to append, 0 will overwrite

Use Append=1 for troubleshooting crashes.

Pcmmv.dll only reads pcmmv.ini at startup, you will have to restart your application after making the INI file edits.

PcmsockXX.exe logging is turned on with command line parameters.
Make a copy of your StartMVS.bat file, then rename the file "StartLogging.bat".

Edit StartLogging.bat in Notepad as follows:

Change V25's line from:
Start Pcmsock25.exe PC_MILER 8250

to:

Start Pcmsock25.exe PC_MILER 8250 LOG_BASIC .\V25log.txt
or
Start Pcmsock25.exe PC_MILER 8250 LOG_BASIC C:\PcmLogs\V25log.txt <=Folder must exist

Other options are:

- Add a fourth parameter of 'Append' to be used to troubleshoot crashes:
  Start Pcmsock25.exe PC_MILER 8250 LOG_BASIC C:\PcmLogs\V25log.txt APPEND

- Include communications and not just routing and distance information, using LOG_ADVANCED instead of LOG_BASIC:
  Start Pcmsock25.exe PC_MILER 8250 LOG_ADVANCED C:\PcmLogs\V25log.txt APPEND

To run on logging for older versions, you will need to copy …\pmw250\tcpip\pcmtcp.dll, listex.dll, and pcmsock25.exe to the older PmwXXX\Tcpip folders. After copying Pcmsock25.exe, rename the copy to PCMSockXX.exe to match the version you are replacing. For example if you are copying pcmsock25.exe to …\pmw220\tcpip, rename this copy of pcmsock25.exe to pcmsock22.exe.

You will need to close the existing instances of PcmsockXX.exe before starting them in logging mode. Failure to close the existing instances will result in 'bind failed' errors.

Pcmsrv32.dll logging is turned on in your pcmserve.ini files.

[Logging]
Enable=0 off 1 on
File=C:\temp\V25log.txt <=Folder must exist
Append=1 to append, 0 will overwrite

Use Append=1 for troubleshooting crashes.

Pcmsrv32.dll only reads pcmserve.ini at startup, you will need to restart pcmsockXX.exe after making the INI file edits.