

Program Numbers 5727-WS1, 5727-WS6

# PC Support/36

## Technical Reference

Office Systems Family



Personal  
Computer  
Software

SC21-9097-3

Program Numbers 5727-WS1, 5727-WS6

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Personal  
Computer  
Software

SC21-9097-3

## **Fourth Edition (June 1987)**

This major revision makes obsolete SC21-9097-2. See the "Preface" for a summary of major changes to this edition. This edition applies to Release 5, Modification level 1, of the IBM System/36 PC Support/36 Products (Program 5727-WS1 for the 5360 and 5362 System Units, and Program 5727-WS6 for the 5364 System Unit), and to all subsequent releases and modifications until otherwise indicated in new editions.

Changes are periodically made to the information herein; these changes will be incorporated in new editions of this publication. This publication contains examples of data and reports used in daily business operations. To illustrate them as completely as possible, the examples include the names of individuals, companies, brands, and products. All of these names are fictitious and any similarity to the names and addresses used for an actual business enterprise is entirely coincidental.

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# Preface

This manual contains installation procedures and technical information for the IBM PC Support/36 program product. It is intended to be a source of additional or infrequently used information about the PC Support/36 program product. This manual is intended for:

- The person responsible for installing PC Support/36
- Programmers who have a personal computer attached to the System/36
- Service representatives who perform service procedures, if necessary
- Sophisticated users who want to understand PC Support/36 in more detail

## Organization of This Manual

This manual has 10 chapters and an index. External tabs are provided to aid you in locating these chapters. A description of each chapter follows:

- Chapter 1, "Installation," contains information on how to install PC Support/36.
- Chapter 2, "The PC Support/36 Configuration File," describes how to create and use the PC Support/36 Configuration file.



- Chapter 3, “The PC Support/36 Routers,” contains information on the PC Support/36 router.
- Chapter 4, “The Virtual Disk Facility,” contains technical information on the PC Support/36 Virtual Disk facility.
- Chapter 5, “The Virtual Printer Facility,” contains technical information about the PC Support/36 Virtual Printer facility.
- Chapter 6, “The Transfer Facility,” contains technical information about the PC Support/36 Transfer facility, data conversions, and the application program interface.
- Chapter 7, “The Translation Table Utility,” describes how to use the Translation Table Utility to create and modify PC Support/36 translation tables.
- Chapter 8, “System/36 PC Utility,” contains instructions on how to use the PC Utility to manage virtual disks and shared folders on the System/36.
- Chapter 9, “The PC Support/36 Message Facility,” contains instructions on how to use the PC Support/36 Message facility.
- Chapter 10, “Service Procedures,” contains instructions on how to gather information about a problem when service is required.

# Related Publications

The following IBM publications contain related information you may find useful:

- *IBM PC Support/36 User's Guide*, SC21-9088
- *IBM PC Support/36 Messages Guide*, SC21-9525
- *IBM PC Support/36 Quick Reference Card*, SX21-9846
- *IBM PC Support/36 Organizer*, SC21-9563
- *IBM PC Support/36 Work Station Feature User's Guide*, SC21-9564
- *IBM PC Support/36 Work Station Feature Technical Reference*, SC21-9569
- *IBM Personal Computer Guide to Operations*
- *IBM Personal Computer Disk Operating System*
- *IBM Personal Computer Disk Operating System Technical Reference*
- *IBM 5250 Emulation Program User's Guide*
- *IBM Enhanced 5250 Emulation Program User's Guide*
- *IBM Enhanced 5250 Emulation Program Technical Reference*
- *IBM Remote 5250 Emulation Program User's Guide*
- *IBM System/36 Operating Your System—5360, 5362*, SC21-9452

- *IBM System/36 Operating Your System—5364, SC21-9453*
- *IBM System/36 Using Your Display Station, SC21-9455*
- *IBM System/36 Concepts and Programmer's Guide, SC21-9019*
- *IBM System/36 Getting Started with the Interactive Data Definition Utility, SC21-8003*
- *IBM System/36 System Reference, SC21-9020*
- *IBM System/36 System Messages, SC21-7938*
- *IBM System/36 Functions Reference, SC21-9436*
- *IBM System/36 Program Problem Diagnosis and Diagnostic Aids, SY21-0593*
- *IBM System/36 System Security Guide, SC21-9042*
- *IBM System/36 Changing Your System Configuration, SC21-9052*
- *Using System/36 Communications, SC21-9082*
- *IBM Token-Ring Network PC Adapter Guide to Operations, 6165874*
- *IBM Token-Ring Network Problem Determination Guide, GA27-0280*

# Summary of Changes

This section lists the major changes in this revision:

- A new installation procedure simplifies the installation of PC Support/36. This change is covered in Chapter 1, "Installation."
- A new link, the IBM Token-Ring Network, is now supported. This change is covered in Chapter 3, "The PC Support/36 Routers."
- In conjunction with the support of the IBM Token-Ring Network, a new PC Support/36 message facility has been added. This change is covered in Chapter 9, "The PC Support/36 Message Facility."
- The definition of several configuration file entries has changed. Several new configuration file entries have been added. These changes are covered in Chapter 2, "The PC Support/36 Configuration File."
- A new parameter has been added to the STF command. This change is covered in Chapter 6, "The Transfer Facility."
- Alternate configuration file names can now be entered on some commands.

# Data Security

PC Support/36, together with the IBM Personal Computer and the IBM System/36, is a powerful and useful tool to help you with your personal and business information processing needs. As with any information system, inadvertent errors may occur and information may be misused.

We suggest that when processing sensitive or valuable information, you take steps to ensure that your data and programs are protected from accidental or intentional unauthorized disclosure, modification, destruction, or misuse. Simple measures, such as removing diskettes when not in use, keeping backup copies of valuable information, or installing the equipment in a secure facility, can help to maintain the integrity and privacy of your information.

In order to be consistent with other System/36 communications and to enhance the security of System/36, the System/36 Token-Ring Network router will keep track of the number of invalid user-ID or password attempts. If the user reaches a configured maximum number of invalid sign-on attempts, all subsequent sign-on attempts will fail, regardless of the validity of the user-ID or password. In order to recover from this, the personal computer must be disabled from the System/36 console. The location name of the personal computer to disable may be obtained from the TRLN entry in the configuration file. After the disable has been done, subsequent attempts to start the router will work as before. For more information on how to disable a PC Support/36 personal computer location, refer to the manual *Using System/36 Communications*.

# Chapter 1. Installation

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# General Overview

This section provides an overview of the steps you must perform to install PC Support/36 on your personal computer. The IBM-supplied PC Support/36 program must be installed on the System/36. The Personal Computer Technical Coordinator must provide you with specific information and an install diskette before you can install PC Support/36.

When you use the INSTALL command with the provided information and an install diskette, it will create a LINK36.BAT file and the necessary configuration files for you to access PC Support/36. Once the installation is complete, you will use the LINK36 command to access your PC Support/36 programs.

There are four sections to the installation chapter:

1. Preparing for Installation

This section describes how to complete the install form.

2. PC Support/36 installation

This section describes the installation process.

3. Copying PC Support/36 programs

This section describes how to copy programs to your personal computer.

4. Forms

This section contains the forms you need to do the installation.

# Preparing for Installation

## Personal Computer Technical Coordinator Instructions

The Personal Computer Technical Coordinator is the individual who has personal computer expertise, responsibility for installation and maintenance of personal computers, and acts as a focal point for questions on the personal computer.

As the Personal Computer Technical Coordinator, you will have to supply information and a diskette to the individual doing the installation on the personal computer. At the end of this chapter, there are four forms that can be used to assist you in this task. You can copy the form needed, fill in the requested information, and give the form and copy of the install diskette to the person doing the installation on the personal computer.

It is recommended that you make a backup copy of the install diskette. This can be done using the DOS DISKCOPY command.

The INSTALL command will install PC Support/36 to either a fixed disk or a diskette. If a working diskette is created, a backup copy should be created using the DOS DISKCOPY command. If the diskette drives are different types, for example, 5-1/4 inch and 3-1/2 inch, use the COPY \*.\* to create the backup diskette.

The next section tells you how to fill out the forms.

# Completing the Installation Forms

The following steps identify the System/36 programs that must be loaded and tell you how to fill out the PC Support/36 installation forms. The steps you follow depend on your system configuration.

---

## 1.0

Is the personal computer the 5364 System console?

**Yes:** Go to step 1.4.

**No:** Continue with step 1.1.

---

## 1.1

Will the personal computer be using emulation?

**Yes:** Continue with step 1.2.

**No:** Go to step 1.3.

---

## 1.2

Will the personal computer have a fixed disk?

**Yes:** Go to step 2.0 (Emulation/Fixed Disk).

**No:** Go to step 3.0 (Emulation/Diskette).

---

## 1.3

The personal computer will be using the IBM Token-Ring Network.

Does the personal computer have a fixed disk?

**Yes:** Go to step 4.0 (Token-Ring/Fixed Disk).

**No:** Go to step 5.0 (Token-Ring/Diskette).

---

## 1.4

Will the 5364 System Console have a fixed disk?

**Yes:** Go to step 6.0 (5364 System Console/Fixed Disk).

**No:** Go to step 7.0 (5364 System Console/Diskette).

---

## 2.0

### **Emulation/Fixed Disk Install**

#### **System/36 Prerequisites**

**(Contact your System/36 system operator, check if complete)**

- PC Support/36 must be installed on the System/36.
- If you are using PC Support/36 Organizer, it must be installed on the System/36.

*Note: If you are using the PC Support/36 Organizer, the PC Support/36 shared folders facility is required.*

- If you are using the PC Support/36 shared folders facility, it must be installed on the System/36.

#### **Personal Computer Prerequisites**

**(Check if Complete)**

- DOS 2.1 or higher must be installed on the personal computer.
- The emulation program must be installed on the personal computer.

## Completing the Form

You will find the Emulation/Fixed Disk Form at the end of this chapter. You must now fill out the back of this form with the information the person installing PC Support/36 on the personal computer will enter on the displays. The following paragraphs tell you how to complete the form.

- System/36 – PC attachment

The form has been preprinted with an X on the emulation line.

- Fixed disk drive and directory

The files on the PC Support/36 install diskette will be copied to the directory *PCS36* on drive *C*. If you want to use other names, write them on the appropriate lines. If the directory does not exist, it will be created in the root directory.

If you want the files to be copied to the root directory, leave the directory line blank.

- Emulation program and parameters

Make a check mark next to the name of the program being used on this personal computer.

DE5250.COM = Enhanced 5250  
Emulation

DP5250.COM = Enhanced 5250  
Emulation with printer session

RE5250.COM = Remote Emulation

RP5250.COM = Remote Emulation  
with printer session

If you are not using the default configuration and keyboard profiles, write the parameters (for example I=XXXX.DAT K=YYYY.PRO) on the line for the emulation program parameters.

This information must be obtained from the person that installed the emulation program on this personal computer.

- Additional Program Support

- Organizer?

If the PC Support/36 Organizer is installed on your System/36, circle 1 (Yes) on the form. If it is not, circle 0 (No).

- Shared folders facility?

If the PC Support/36 shared folders facility is installed on your System/36, circle 1 (Yes) on the form. If it is not, circle 0 (No).

- Rename LINK36.BAT? (optional)

If the directory you specified already has a LINK36.BAT, it may be renamed before a new LINK36.BAT file is created.

If you circle 1 (Yes), the default, the INSTALL command will rename your old file to LINK36.BAK and create a new LINK36.BAT file.

*Note: If a LINK36.BAK file exists in the directory, it will be deleted before the rename.*

If you circle 0 (No), the old file will be deleted and a new LINK36.BAT file will be created.

- Create AUTOEXEC.BAT? (optional)

*Note: INSTALL will not modify an existing AUTOEXEC.BAT file.*

If the root directory does not contain an AUTOEXEC.BAT file, one may be created.

If you circle 1 (Yes), the default, the INSTALL command will create an AUTOEXEC.BAT file. This file will contain DATE, TIME, and LINK36. If you circle 0 (No), no file will be created and LINK36 must be entered each time the personal computer is started.



## **After Completing the Form**

You must now give a copy of the PC Support/36 install diskette and the completed form to each person doing the personal computer installation. The front of the form tells how to perform the installation.

If you need more information about the `INSTALL` command, refer to “Emulation/Fixed Disk” later in this chapter.

## 3.0

### Emulation/Diskette Install

#### System/36 Prerequisites

**(Contact your System/36 system operator, check if complete)**

— PC Support/36 must be installed on the System/36.

— If you are using the PC Support/36 Organizer, it must be installed on the System/36.

*Note: If you are using the PC Support/36 Organizer, the PC Support/36 shared folders facility is required.*

— If you are using PC Support/36 shared folders, it must be installed on the System/36.

#### Personal Computer Prerequisites

**(Check if Complete)**

— A diskette containing DOS 2.1 or higher must be available.

— The working diskette containing the emulation program must be available. The working diskette is created when you install the emulation program.

## Completing the Form

You will find the Emulation/Diskette Form at the end of this chapter. You must now fill out the back of this form with the information the person installing PC Support/36 on the personal computer will enter on the installation displays. The following paragraphs tell you how to complete the back of the form.

### 1. System/36 – PC attachment

The form has been preprinted with an X on the emulation line.

### 2. Emulation program and parameters

Make a check mark next to the name of the program being used on this personal computer.

DE5250.COM = Enhanced 5250  
Emulation

DP5250.COM = Enhanced 5250  
Emulation with printer session

If you are not using the default configuration and keyboard profiles, write the emulation parameters (for example, I=XXXXXX.DAT K=YYYYYY.PRO) for the DE5250 and DP5250 programs only, on the line for the parameters.

This information must be obtained from the person that installed the emulation program on this personal computer.

### 3. Additional Program Support

- Organizer?

If the PC Support/36 Organizer is installed on your System/36, circle 1 (Yes) on the form. If it is not, circle 0 (No).

- Shared folders facility?

If the PC Support/36 shared folders facility is installed on your System/36, circle 1 (Yes) on the form. If it is not, circle 0 (No).

#### **After Completing the Form**

You must now give a copy of the PC Support/36 install diskette and the completed form to each person doing the personal computer installation. The front of the form tells how to perform the installation.

If you need more information about the `INSTALL` command, refer to “Emulation/Diskette” later in this chapter.

## IBM Token-Ring/Fixed Disk Install

### System/36 Prerequisites

**(Contact your System/36 system operator, check if complete)**

- IBM Token-Ring Network must be installed on the System/36.
- PC Support/36 must be installed on the System/36.
- If you will be using the PC Support/36 Organizer, it must be installed on the System/36.

*Note: If you are using the PC Support/36 Organizer, then the PC Support/36 shared folders facility and the PC Support/36 Work Station Feature are required.*

- If you will be using the PC Support/36 shared folders facility, it must be installed on the System/36.
- If you will be using the PC Support/36 Work Station Feature, it must be installed on the System/36.
- CNFIGICF procedure for PC Support/36 has been run. Refer to the manual *Using System/36 Communications*.
- ENABLE procedure has been run. Refer to the manual *Using System/36 Communications*.

## **Personal Computer Prerequisites**

### **(Check if Complete)**

- DOS 3.2 or higher must be installed on the personal computer.
- The IBM Token-Ring Network PC Adapter Support Interface program (TOKREUI.COM) must be installed on the personal computer.

*Note: TOKREUI.COM is found on the IBM Token-Ring Network PC Adapter diskette contained in the IBM Token-Ring Network PC Adapter Hardware Reference Library – Guide to Operations.*

## Completing the Form

You will find the Token-Ring/Fixed Disk Form at the end of this chapter. You must now fill out the back of this form with the information the person installing PC Support/36 on the personal computer will enter on the installation displays. The following paragraphs tell you how to complete the back of the form.

### 1. System/36 – PC attachment

The form has been preprinted with an X on the IBM Token-Ring Network line.

### 2. Fixed disk drive and directory

The files on the PC Support/36 install diskette will be copied to the directory *PCS36* on drive *C*. If you want to use other names, write them on the appropriate lines. If the directory does not exist, it will be created in the root directory.

If you want the files copied to the root directory, leave the directory line blank.

### 3. IBM Token-Ring Network information.

- PC location name

This is a unique name (maximum of 8 characters) devised by you that identifies this personal computer. For example, you could use the IBM Token-Ring Network cable number preceded by a # character as the PC location name, a user ID (JOE), or a personal computer identifier (PC1).

The name must follow the following conventions:

- The first character must be alphabetic, #, @, or \$.
- The rest of the characters can be alphanumeric, #, @, or \$.
- There can be no leading or imbedded blanks.

- System/36 link name

This is a name (maximum of 8 characters) devised by you that identifies the System/36 where PC Support/36 is installed. It is recommended that this name be the same on all personal computers connected to this System/36 (for example, the System/36 node name or S36LINK).

The link name must meet the same naming conventions as the PC location name.



The `INSTALL` command will set up a link with one System/36. If you need to set up additional links for multiple systems, it must be done after the installation is complete. Refer to “Multiple Systems” in Chapter 3, “The PC Support/36 Routers,” for more information.

- IBM Token-Ring Network adapter address

This is the 12-character hexadecimal address of the System/36 IBM Token-Ring Network Adapter.

To find this address, you must go to your System/36 and type `D H,9` (line 9) or `D H,10` (line 10) to display the address. If the address field displays *Default*, see the System/36 system operator or the person who ran diagnostics on the IBM Token-Ring Network hardware.

- IBM Token-Ring Network program name

Write the name of the IBM Token-Ring Network PC Adapter Support Interface program being used (for example, `TOKREUI.COM`).

#### 4. Additional Program Support

- Organizer?

If the PC Support/36 Organizer is installed on your System/36, circle 1 (Yes) on the form. If it is not, circle 0 (No).

- Shared folders facility?

If the PC Support/36 shared folders facility is installed on your System/36, circle 1 (Yes) on the form. If it is not, circle 0 (No).

- Work Station Feature?

If the PC Support/36 Work Station feature is installed on your System/36, circle 1 (Yes) on the form. If it is not, circle 0 (No).

#### 5. Rename LINK36.BAT? (optional)

If the directory you specified already has a LINK36.BAT file, it may be renamed before a new LINK36.BAT file is created.

If you circle 1 (Yes), the default, the INSTALL command will rename your old file to LINK36.BAK and create a new LINK36.BAT file.

*Note: If a LINK36.BAK file exists in the directory, it will be deleted before the rename.*

If you circle 0 (No), the old file will be deleted and a new LINK36.BAT file will be created.

6. Create AUTOEXEC.BAT? (optional)

*Note: INSTALL will not modify an existing AUTOEXEC.BAT file.*

If the root directory does not contain an AUTOEXEC.BAT file, one may be created.

If you circle 1 (Yes), the default, the INSTALL command will create an AUTOEXEC.BAT file for the user. This file will contain DATE, TIME, and LINK36. If you circle 0 (No), no file will be created and LINK36 must be entered each time the personal computer is started.

**After Completing the Form**

You must now give a copy of the PC Support/36 install diskette and the completed form to each person doing the personal computer installation. The front of the form tells how to perform the installation.

If you need more information about the INSTALL command, refer to "IBM Token-Ring/Fixed Disk" later in this chapter.

## 5.0

# IBM Token-Ring/Diskette Install

### System/36 Prerequisites

**(Contact your System/36 system operator, check if complete)**

- IBM Token-Ring Network must be installed on the System/36.
- PC Support/36 must be installed on the System/36.
- If you will be using the PC Support/36 Organizer, it must be installed on the System/36.

*Note: If you are using the PC Support/36 Organizer, then the PC Support/36 shared folders facility and the PC Support/36 Work Station Feature are required.*

- If you will be using PC Support/36 shared folders, it must be installed on the System/36.
- If you will be using the PC Support/36 Work Station Feature, it must be installed on the System/36.
- CNFIGICF procedure for PC Support/36 has been run. Refer to the manual *Using System/36 Communications*.
- ENABLE procedure has been run. Refer to the manual *Using System/36 Communications*.

## Personal Computer Prerequisites

### (Check if Complete)

- A diskette containing DOS 3.2 or higher must be available.
- A diskette containing the IBM Token-Ring Network PC Adapter Support Interface program (TOKREUI.COM) must be available.

*Note: TOKREUI.COM is found on the IBM Token-Ring Network PC Adapter diskette contained in the IBM Token-Ring Network PC Adapter Hardware Reference Library – Guide to Operations.*

## Completing the Form

You will find the Token-Ring/Diskette Form at the end of this chapter. You must fill out the back of this form with the information the person installing PC Support/36 on the personal computer will enter on the installation displays. The following paragraphs tell you how to complete the back of the form.

### 1. System/36 – PC attachment

The form has been preprinted with an X on the IBM Token-Ring Network line.

### 2. IBM Token-Ring Network information

- PC location name

This is a unique name (maximum of 8 characters) devised by you that identifies this personal computer. For example, you could use the IBM Token-Ring Network cable number, preceded by a # character as the PC location name, a user ID (JOE), or a personal computer identifier (PC1).

The name must follow the following conventions:

- The first character must be alphabetic, #, @, or \$.
- The rest of the characters can be alphanumeric, #, @, or \$.
- There can be no leading or imbedded blanks.

- System/36 link name

This is a name (maximum of 8 characters) devised by you that identifies the System/36 where PC Support/36 is installed. It is recommended that this name be the same on all personal computers connected to this System/36 (for example, the System/36 node name or S36LINK).

The link name must meet the same naming conventions as the PC location name.

The INSTALL command will set up a link with one System/36. If you need to set up additional links for multiple systems, it must be done after the installation is complete. Refer to “Multiple Systems” in Chapter 3, “The PC Support/36 Routers” for more information.

- IBM Token-Ring Network adapter address

This is the 12-character hexadecimal address of the IBM System/36 Token-Ring Network adapter.

To find this address you must go to your System/36 and type D H,9 (line 9) or D H,10 (line 10) to display the address. If the address field displays *Default*, see the System/36 system operator or the person who ran diagnostics on the IBM Token-Ring Network hardware.

- IBM Token-Ring Network program name

Write the name of the IBM Token-Ring Network PC Adapter Support Interface program being used (for example, TOKREUI.COM).

### 3. Additional Program Support

- Organizer?

If the PC Support/36 Organizer is installed on your System/36, circle 1 (Yes) on the form. If it is not, circle 0 (No).

- Shared folders facility?

If the PC Support/36 shared folders facility is installed on your System/36, circle 1 (Yes) on the form. If it is not, circle 0 (No).

- Work Station Feature?

If the PC Support/36 Work Station Feature is installed on your System/36, circle 1 (Yes) on the form. If it is not, circle 0 (No).



## **After Completing the Form**

You must now give a copy of the PC Support/36 install diskette and the completed form to each person doing the personal computer installation. The front of the form tells how to perform the installation.

If you need more information about the INSTALL command, refer to "IBM Token-Ring/Diskette" later in this chapter.

## 6.0

### **5364 System Console/Fixed Disk Install**

#### **System/36 Prerequisites**

**(Contact your System/36 system operator,  
check if complete)**

- PC Support/36 must be installed on the System/36.
- If you are using PC Support/36 shared folders, it must be installed on the System/36.

#### **Personal Computer Prerequisites**

**(Check if Complete)**

- DOS 3.1 or higher must be installed on the personal computer.

## Completing the Form

You will find the 5364 System Console/Fixed Disk Form at the end of this chapter. You must now fill out the back of this form with the information the person installing PC Support/36 on the personal computer will enter on the displays. The following paragraphs tell you how to complete the form.

- System/36 – PC attachment

The form has been preprinted with an X on the 5364 System console line.

- Fixed disk drive and directory

The files on the PC Support/36 install diskette will be copied to the directory *PCS36* on drive *C*. If you want to use other names, write them on the appropriate lines. If the directory does not exist, it will be created in the root directory.

If you want the files to be copied to the root directory, leave the directory line blank.

- Additional Program Support

- Shared folders facility?

If the PC Support/36 shared folders facility is installed on your System/36, circle 1 (Yes) on the form. If it is not, circle 0 (No).

- Rename LINK36.BAT? (optional)

If the directory you specified already has a LINK36.BAT, it may be renamed before a new LINK36.BAT file is created.

If you circle 1 (Yes), the default, the INSTALL command will rename your old file to LINK36.BAK and create a new LINK36.BAT file.

*Note: If a LINK36.BAK file exists in the directory, it will be deleted before the rename.*

If you circle 0 (No), the old file will be deleted and a new LINK36.BAT file will be created.

## **After Completing the Form**

**You must now give a copy of the PC Support/36 install diskette and the completed form to each person doing the personal computer installation. The front of the form tells how to perform the installation.**

**If you need more information about the INSTALL command, refer to “5364 System Console/Fixed Disk” later in this chapter.**

## 7.0

### **5364 System Console/Diskette Install**

#### **System/36 Prerequisites**

**(Contact your System/36 system operator,  
check if complete)**

- PC Support/36 must be installed on the System/36.
- If you are using PC Support/36 shared folders, it must be installed on the System/36.

#### **Personal Computer Prerequisites**

**(Check if Complete)**

- A diskette containing DOS 3.1 or higher must be available.
- The PC DSKT04 working diskette must be available.

## **Completing the Form**

You will find the 5364 System Console/Diskette Form at the end of this chapter. You must now fill out the back of this form with the information the person installing PC Support/36 on the personal computer will enter on the installation displays. The following paragraphs tell you how to complete the back of the form.

### **1. System/36 – PC attachment**

The form has been preprinted with an X on the 5364 System Console line.

### **2. Additional Program Support**

- **Shared folders facility?**

If the PC Support/36 shared folders facility is installed on your System/36, circle 1 (Yes) on the form. If it is not, circle 0 (No).

## **After Completing the Form**

You must now give a copy of the PC Support/36 install diskette and the completed form to each person doing the personal computer installation. The front of the form tells how to perform the installation.

If you need more information about the **INSTALL** command, refer to “5364 System Console/Diskette” later in this chapter.



# PC Support/36 Installation

## Emulation/Fixed Disk

### Overview

The goal of the installation process is to make it as easy as possible for you to access PC Support/36 programs. Through a series of interactive displays, you will provide the necessary information to install PC Support/36. After completing the installation, you need only restart your PC and optionally type LINK36 to access the PC Support/36 programs you want to use.

An installed emulation program is a prerequisite to installing PC Support/36. The INSTALL command will run INSTFD.COM to search the fixed disk you specified. This is done for you so that you do not have to remember the path. If the program is not found, an error is given and the INSTALL command must be restarted after installing the emulation program. If more than one copy of the emulation program is found, you can choose the path to use from a list (maximum of six).

The following programs are copied from the install diskette to the specified directory (the default is PCS36):

CFGVDSK.COM  
STARTRTR.EXE  
5250RTR.EXE  
STOPRTR.EXE  
VDSK.SYS  
FSDDX.SYS  
FSDD.SYS

If the directory does not exist, it will be created in the root directory. If the directory does exist, programs with the same name will be replaced with the new program (STARTRTR.COM and STOPRTR.COM will be deleted).

The specified directory must contain a CONFIG.S36 configuration file. If CONFIG.S36 already exists, the required entries that are not present will be added. If CONFIG.S36 does not exist, the INSTALL command will create a CONFIG.S36 file with the necessary entries.

A LINK36.BAT file will be created in the specified directory to start PC Support/36. If a LINK36.BAT already exists, you will have a chance to rename the original LINK36.BAT with the name LINK36.BAK. If you chose to rename, and there is an existing LINK36.BAK file, it will be deleted. The first command in the LINK36 will be the command to start the emulation program. This command will be added only if it was not found in the AUTOEXEC.BAT.

A CONFIG.SYS file will be created in the root directory to start PC Support/36. If a CONFIG.SYS file already exists, the required entries will be added if they are not already present in the file (parameters on any existing DEVICE entries for VDSK.SYS, FSDDX.SYS, and FSDD.SYS will be deleted). If a CONFIG.SYS does not exist, then the INSTALL command will create a CONFIG.SYS file with the necessary entries to start PC Support/36.

If an AUTOEXEC.BAT file does not exist, you can choose to have one created. If so, the AUTOEXEC.BAT will contain DATE, TIME, and LINK36. If not, or if you already have an AUTOEXEC.BAT, you must type LINK36 after restarting the computer. The INSTALL command will not modify your AUTOEXEC.BAT file.

You will be able to specify what additional PC Support/36 programs are being used in order to tailor your CONFIG.SYS, CONFIG.S36, and LINK36.BAT files.

## **Prerequisites**

You must have received a copy of the PC Support/36 installation diskette and information form from your Personal Computer Technical Coordinator.

The following must be installed on your fixed disk:

1. DOS 2.1 or higher
2. The emulation program

## To Start Installation

- Make sure DOS is running.
- Insert the install diskette in drive A.
- Type the following:

**A:INSTALL F**

On the following display, select option 1, then press the Enter key.

```
-----SYSTEM/36 - PC ATTACHMENT-----  
  
Select type of attachment:  
1. Emulation  
2. Token-Ring  
3. 5364 System Console  
  
Select==> 1  
  
-----  
Enter  Esc=Quit                               Version 04.00 (c) IBM Corp. 1987-----
```

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Follow the instructions on the subsequent displays and enter the information from the form when requested.

When the installation is complete, an "Installation Complete" display will appear.

## To Complete Installation

- Remove the install diskette from drive A.
- Restart the personal computer by pressing the following keys at the same time:

**CTRL ALT DEL**

- Type the following if an AUTOEXEC.BAT file was not created during INSTALL, or you did not add a LINK36 command to your AUTOEXEC.BAT file:

**d:\dir\LINK36**

where:

**d:** is the fixed disk drive specified during INSTALL.

**dir** is the PC Support/36 directory specified during INSTALL.

## After Installation

When the installation process is complete, the following files will contain the indicated statements:

*Note: In the following files, the term `d:\dir\` may precede `LINK36`, `VDSK.SYS`, `FSDDX.SYS`, and `FSDD.SYS`,*

*where:*

*`d:` is the name of the specified fixed disk drive.*

*`dir` is the name of a specified directory on the fixed disk drive.*

*For example, if you are using a fixed disk drive named `C` and a directory named `PCS36`, the statement would appear as:*

*`C:\PCS36\LINK36`*

## AUTOEXEC.BAT (Optional)

DATE  
TIME  
LINK36

## **CONFIG.SYS**

**DEVICE = VDSK.SYS**

If the PC Support/36 Organizer or the PC Support/36 shared folders facility is being used, the following entries will be added:

**DEVICE = FSDDX.SYS**

**DEVICE = FSDD.SYS**

## **CONFIG.S36**

**SUPPORT/36**

**RTYP 5250**

**VDSK I,#IWPCLD2,3**

## LINK36.BAT

```
d:
CD \path
Emulation program name
d:
CD \dir
STARTRTR.EXE
ECHO OFF
IF ERRORLEVEL 20 GOTO EXIT
ECHO ON
CFGVDSK.COM
ECHO OFF
IF ERRORLEVEL 20 GOTO EXIT
```

If you are using the PC Support/36 Organizer, the following entries will be added:

```
ECHO ON
I:
FSPC ASSIGN
ECHO OFF
IF ERRORLEVEL 20 GOTO EXIT
ECHO ON
PCO.EXE
I:
FSPC RELEASE *
STOPRTR /F
d:
ECHO OFF
:EXIT
ECHO ON
```

If you are not using the PC Support/36 Organizer, the following exit entries will be added at the end of the file.

```
I:
:EXIT
ECHO ON
```



# Emulation/Diskette

## Overview

The goal of the installation process is to make it as easy as possible for you to access PC Support/36 programs. Through a series of interactive displays, you will provide the necessary information to install PC Support/36. After completing the installation, you need only restart your personal computer and optionally start the emulation program and LINK36 to access the PC Support/36 programs you want to use.

The result of the installation will be a working diskette (you may label it PC Support/36 LINK36 diskette) containing all the necessary programs to access PC Support/36.

*Note: Only the Enhanced 5250 Emulation Program Version 2.1 (either DE5250.COM or DP5250.COM) and the associated configuration and keyboard profiles will be copied to the working diskette.*

The INSTALL command will run INSTDK.COM to create or copy the following files to your working diskette:

CFGVDSK.COM  
STARTRTR.EXE  
5250RTR.EXE  
STOPRTR.EXE  
VDSK.SYS  
FSDDX.SYS  
FSDD.SYS  
CONFIG.S36  
CONFIG.SYS  
LINK36.BAT  
AUTOEXEC.BAT

Optional:

DE5250.COM or DP5250.COM  
Configuration profile  
Keyboard profile

If you are using DP5250.COM or DE5250.COM, the first command in the LINK36.BAT will be the emulation start-up command.

The AUTOEXEC.BAT file will always be created with DATE and TIME commands. The LINK36 command will be added only for DE5250 and DP5250.

You will be able to specify what additional PC Support/36 programs are being used in order to tailor your CONFIG.SYS, CONFIG.S36, and LINK36.BAT files.

## **Prerequisites**

You must have received a copy of the PC Support/36 installation diskette and information form from your Personal Computer Technical Coordinator.

You will need the following:

1. A diskette containing DOS 2.1 or higher
2. A formatted diskette (FORMAT /S; refer to your DOS manual if needed)
3. A working diskette containing the emulation program

## To Start Installation

- Make sure DOS is running.
- Insert the install diskette in drive A.
- If you have a personal computer with one diskette drive, type:

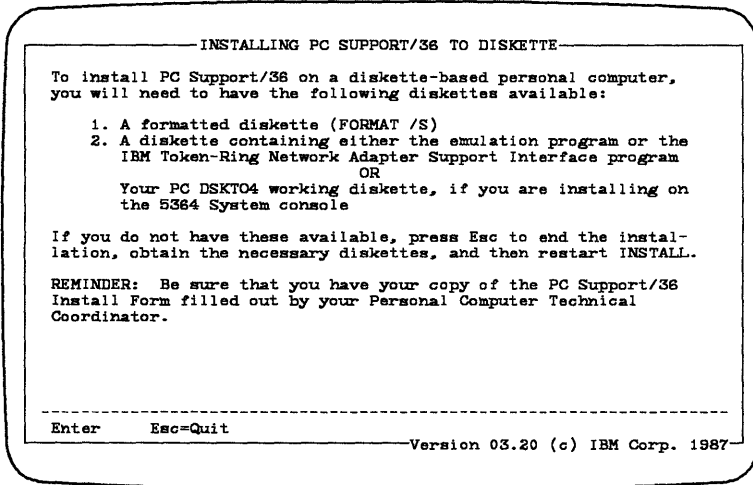
**A:INSTALL D1**

- If you have a personal computer with two diskette drives, type:

**A:INSTALL D2**

*Note: Insert the formatted diskette in drive B.*

The following display will appear:



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After reading the instructions on the display, press the Enter key.

The following display will appear. Select option 1, then press the Enter key.

```
-----SYSTEM/36 - PC ATTACHMENT-----  
  
Select type of attachment:  
1. Emulation  
2. Token-Ring  
3. 5384 System Console  
  
Select====> 1  
  
-----  
Enter  Esc=Quit                               Version 04.00 (c) IBM Corp. 1987-----
```

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Follow the instructions on the subsequent displays and enter the information from the form when requested.

When the installation is complete, an "Installation Complete" display will appear.

## To Complete Installation

- Insert the formatted diskette in drive A.
- Restart the personal computer by pressing the following keys at the same time:

**CTRL ALT DEL**

- If you are using Enhanced 5250 Emulation, you can now run PC Support/36.
- If you are not using Enhanced 5250 Emulation:
  1. Insert the diskette containing the emulation programs in drive A.
  2. Type the command to start the emulation program.
  3. Insert the formatted diskette in drive A.
  4. Type: **LINK36**

## **After Installation**

When the installation process is complete, the following files will contain the indicated statements:

### **AUTOEXEC.BAT**

```
DATE  
TIME  
LINK36
```

*Note: LINK36 will only be added for  
Enhanced 5250 Emulation.*

### **CONFIG.SYS**

```
DEVICE = VDSK.SYS
```

If the PC Support/36 Organizer or the PC Support/36 shared folders facility is being used, the following entries will be added:

```
DEVICE = FSDDX.SYS  
DEVICE = FSDD.SYS
```

### **CONFIG.S36**

```
SUPPORT/36  
RTYP 5250  
VDSK I,#IWPCLD2,3
```

## **LINK36.BAT**

```
DE5250.COM T or DP5250.COM T
  (optional)
STARTRTR.EXE
ECHO OFF
IF ERRORLEVEL 20 GOTO EXIT
ECHO ON
CFGVDSK.COM
ECHO OFF
IF ERRORLEVEL 20 GOTO EXIT
```

If you are using the PC Support/36 Organizer, the following entries will be added:

```
ECHO ON
I:
FSPC ASSIGN
ECHO OFF
IF ERRORLEVEL 20 GOTO EXIT
ECHO ON
PCO.EXE
I:
FSPC RELEASE *
STOPRTR /F
A:
ECHO OFF
:EXIT
ECHO ON
```

If you are not using the PC Support/36 Organizer, the following exit entries will be added at the end of the file.

```
I:
:EXIT
ECHO ON
```

# IBM Token-Ring/Fixed Disk

## Overview

The goal of the installation process is to make it as easy as possible for you to access PC Support/36 programs. Through a series of interactive displays, you will provide the necessary information to install PC Support/36. After completing the installation, you need only restart your personal computer and optionally type LINK36 to access the PC Support/36 programs you want to use.

An installed IBM Token-Ring Network program is a prerequisite to installing PC Support/36. The INSTALL command will run INSTFD.COM to search the fixed disk you specified. This is done for you, so that you do not have to remember the path. If the program is not found, an error is given, and the INSTALL command must be restarted after installing the IBM Token-Ring Network program. If more than one copy of the program is found, you can choose the path to use from a list (maximum of six).

The following programs are copied from the install diskette to the specified directory (the default is PCS36):

```
CFGVDSK.COM
STARTRTR.EXE
ITRNRTR.EXE
STOPRTR.EXE
VDSK.SYS
FSDDX.SYS
FSDD.SYS
```



If the directory does not exist, it will be created in the root directory. If the directory does exist, programs with the same name will be replaced with the new program (STARTRTR.COM and STOPRTR.COM will be deleted).

The specified directory must contain a CONFIG.S36 configuration file. If a CONFIG.S36 already exists, the required entries that are not present will be added. If CONFIG.S36 does not exist, the INSTALL command will create a CONFIG.S36 file with the necessary entries.

A LINK36.BAT file will be created in the specified directory to start PC Support/36. If a LINK36.BAT already exists, you will have the chance to rename the original LINK36.BAT with the name LINK36.BAK. If you chose to rename, and there is an existing LINK36.BAK, the file will be deleted. The first command in LINK36.BAT will be the command to start the IBM Token-Ring Network program. This command will be added only if it was not found in the AUTOEXEC.BAT.

A CONFIG.SYS file will be created in the root directory to start PC Support/36. If a CONFIG.SYS file already exists, the required entries will be added, if they are not already present in the file (parameters on any existing DEVICE entries for VDSK.SYS, FSDDX.SYS, and FSDD.SYS will be deleted). If a CONFIG.SYS does not exist, then the INSTALL command will create a CONFIG.SYS with the necessary entries to start PC Support/36.

If an AUTOEXEC.BAT file does not exist, you can choose to have one created. If so, the AUTOEXEC.BAT will contain DATE, TIME, and LINK36. If not, or if you already have an AUTOEXEC.BAT, you must type LINK36 after restarting the computer. Install will not modify your AUTOEXEC.BAT file.

You will be able to specify what additional PC Support/36 programs are being used in order to tailor your CONFIG.SYS, CONFIG.S36, and LINK36.BAT files.

## **Prerequisites**

You must have received a copy of the PC Support/36 installation diskette and information form from your Personal Computer Technical Coordinator.

The following must be installed on your fixed disk:

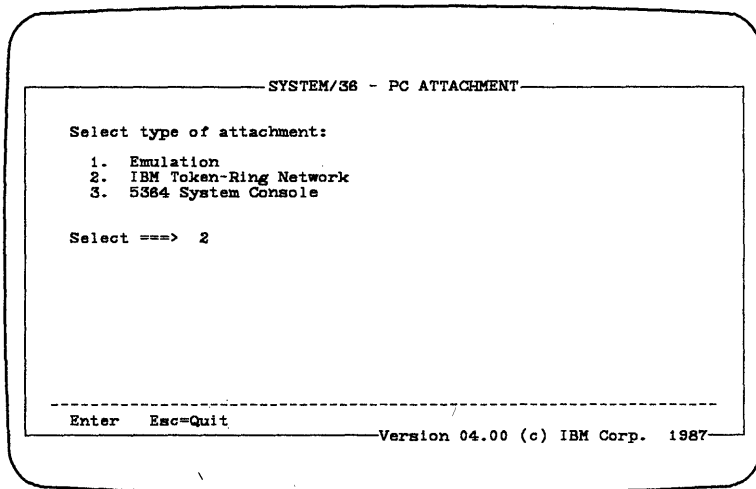
1. DOS 3.2 or higher
2. The IBM Token-Ring Network PC Adapter Support Interface program

## **To Start Installation**

- Make sure DOS is running.
- Insert the install diskette in drive A.
- Type the following:

**A:INSTALL F**

On the following display, select option 2, then press the Enter key.



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Follow the instructions on the subsequent displays and enter the information from the form when requested.

When the installation is complete, an "Installation Complete" display will appear.

## To Complete Installation

- Remove the install diskette from drive A.
- Restart the personal computer by pressing the following keys at the same time:

**CTRL ALT DEL**

- Type the following if an AUTOEXEC.BAT file was not created during INSTALL, or you did not add a LINK36 command to your AUTOEXEC.BAT:

**d:\dir\LINK36**

where:

**d:** is the fixed disk drive specified during INSTALL.

**dir** is the PC Support/36 directory specified during INSTALL.

## After Installation

When the installation process is complete the following files will contain the indicated statements:

*Note: In the following file, the term **d:\dir\** may precede **LINK36**, **VDSK.SYS**, **FSDDX.SYS**, and **FSDD.SYS**.*

*where:*

***d:** is the name of the specified fixed disk drive.*

***dir** is the name of a specified directory on the fixed disk drive.*

*For example, if you are using a fixed disk drive named **C** and a directory named **PCS36** the statement would appear as:*

***C:\PCS36\LINK36***

## AUTOEXEC.BAT (Optional)

DATE  
TIME  
LINK36

## **CONFIG.SYS**

**DEVICE = VDSK.SYS**

If the PC Support/36 Organizer or the PC Support/36 shared folders facility is being used, the following entries will be added:

**DEVICE = FSDDX.SYS**

**DEVICE = FSDD.SYS**

If the Work Station Feature is being used, the following entry will be added:

**FILES = 15**

## **CONFIG.S36**

**SUPPORT/36**

**VDSK I,#IWPCLD2,3**

**RTYP ITRN**

**TRLN location name**

**TRLI link name, adapter address**

If the Work Station Feature and/or the PC Support/36 Organizer is being used, the following entry will be added:

**VDSK H,#IWPCLD4,3**

## LINK36.BAT

```
d:
CD \path
Token-Ring program name
d:
CD \dir
STARTRTR.EXE
ECHO OFF
IF ERRORLEVEL 20 GOTO EXIT
ECHO ON
CFGVDSK.COM
ECHO OFF
IF ERRORLEVEL 20 GOTO EXIT
```

If you are using the Work Station Feature,  
the following entries will be added:

```
ECHO ON
H:
WSF.EXE /T
ECHO OFF
IF ERRORLEVEL 20 GOTO EXIT
```

If you are using the PC Support/36 Organizer,  
the following entries will be added:

```
ECHO ON
I:
FSPC ASSIGN
ECHO OFF
IF ERRORLEVEL 20 GOTO EXIT
ECHO ON
PCO.EXE
I:
FSPC RELEASE *
ECHO OFF
:EXIT
ECHO ON
```

If you are not using the PC Support/36 Organizer, the following entries will be added at the end of the file:

```
I:  
:EXIT  
ECHO ON
```

i



# IBM Token-Ring/Diskette

## Overview

The goal of the installation process is to make it as easy as possible for you to access PC Support/36 programs. Through a series of interactive displays, you will provide the necessary information to install PC Support/36. The result of the installation will be a working diskette (you may label it PC Support LINK36 diskette) containing all the necessary programs (including TOKREUI.COM) to access PC Support/36. You need only restart your personal computer from the working diskette and LINK36 will run automatically.

The INSTALL command will run INSTDK.COM to create or copy the following files to your working diskette:

CFGVDSK.COM  
STARTRTR.EXE  
ITRNRTR.EXE  
STOPRTR.EXE  
VDSK.SYS  
FSDDX.SYS  
FSDD.SYS  
CONFIG.S36  
CONFIG.SYS  
LINK36.BAT  
AUTOEXEC.BAT  
TOKREUI.COM

A LINK36.BAT file will be created with the command to start the IBM Token-Ring Network program as its first command.

The AUTOEXEC.BAT file will always be created with the DATE, TIME, and LINK36 commands.

You will be able to specify what additional PC Support/36 programs are being used in order to tailor your CONFIG.SYS, CONFIG.S36, and LINK36.BAT files.

## **Prerequisites**

You must have received a copy of the PC Support/36 installation diskette and information form from your Personal Computer Technical Coordinator.

You will need the following:

1. A diskette containing DOS 3.2 or higher
2. A formatted diskette (FORMAT /S; refer to your DOS manual, if needed)
3. A diskette containing the IBM Token-Ring Network PC Adapter Support Interface program

## To Start Installation

- Make sure DOS is running.
- Insert the install diskette in drive A.
- If you have a personal computer with one diskette drive, type:

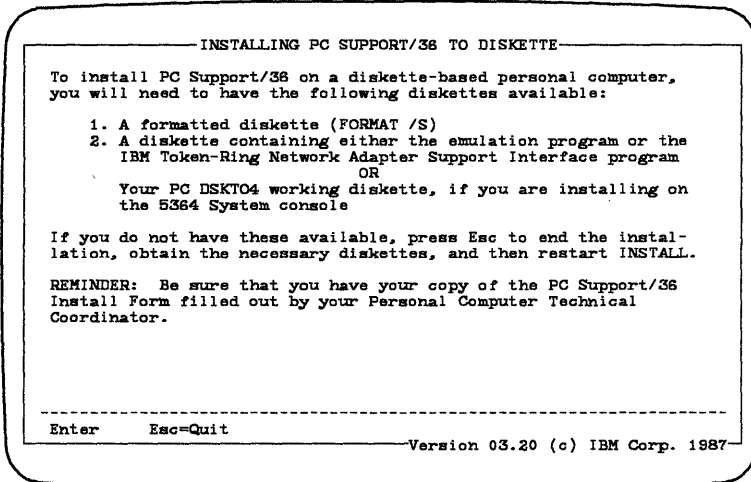
**A:INSTALL D1**

- If you have a personal computer with two diskette drives, type:

**A:INSTALL D2**

*Note: Insert the formatted diskette in drive B.*

The following display will appear:



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After reading the instructions on the display, press the Enter key.

The following display will appear. Select option 2, then press the Enter key.

```
-----SYSTEM/38 - PC ATTACHMENT-----  
  
Select type of attachment:  
  1. Emulation  
  2. IBM Token-Ring Network  
  3. 5364 System Console  
  
Select ==> 2  
  
-----  
Enter  Esc=Quit                               Version 04.00 (c) IBM Corp. 1987-----
```

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Follow the instructions on the subsequent displays and enter the information from the form when requested.

When the installation is complete, an "Installation Complete" display will appear.

## To Complete Installation

- Insert the formatted diskette in drive A.
- Restart the personal computer by pressing the following keys at the same time:

**CTRL ALT DEL**

## After Installation

When the installation process is complete, the following files will contain the indicated statements:

### **AUTOEXEC.BAT (Optional)**

DATE  
TIME  
LINK36

### **CONFIG.SYS**

DEVICE = VDSK.SYS

If the PC Support/36 Organizer or the PC Support/36 shared folders facility is being used, the following entries will be added:

DEVICE = FSDDX.SYS  
DEVICE = FSDD.SYS

If the Work Station Feature is being used, the following entry will be added:

FILES = 15

## **CONFIG.S36**

SUPPORT/36  
VDSK I,#IWPCLD2,3  
RTYP ITRN  
TRLN location name  
TRLI link name, adapter address

If the Work Station Feature and/or the PC Support/36 Organizer is being used, the following entry will be added:

VDSK H,#IWPCLD4,3

## **LINK36.BAT**

TOKREUI.COM  
STARTRTR.EXE  
ECHO OFF  
IF ERRORLEVEL 20 GOTO EXIT  
ECHO ON  
CFGVDSK.COM  
ECHO OFF  
IF ERRORLEVEL 20 GOTO EXIT

If the Work Station Feature is being used, the following entries will be added:

```
ECHO ON
H:
WSF.EXE /T
ECHO OFF
IF ERRORLEVEL 20 GOTO EXIT
```

If the PC Support/36 Organizer is being used, the following entries will be added:

```
ECHO ON
I:
FSPC ASSIGN
ECHO OFF
IF ERRORLEVEL 20 GOTO EXIT
ECHO ON
PCO.EXE
I:
FSPC RELEASE *
ECHO OFF
:EXIT
ECHO ON
```

If you are not using the PC Support/36 Organizer, the following entries will be added at the end of the file.

```
I:
:EXIT
ECHO ON
```

# 5364 System Console/Fixed Disk

## Overview

The goal of the installation process is to make it as easy as possible for you to access PC Support/36 programs. Through a series of interactive displays, you will provide the necessary information to install PC Support/36. After completing the installation, you need only restart your PC and type LINK36 to access the PC Support/36 programs you want to use.

The INSTALL command will run INSTFD.COM to copy the following programs from the install diskette to the specified directory (the default is PCS36):

CFGVDSK.COM  
STARTRTR.EXE  
5250RTR.EXE  
STOPRTR.EXE  
VDSK.SYS  
FSDDX.SYS  
FSDD.SYS



If the directory does not exist, it will be created in the root directory. If the directory does exist, programs with the same name will be replaced with the new program (STARTRTR.COM and STOPRTR.COM will be deleted).

The specified directory must contain a CONFIG.S36 configuration file. If CONFIG.S36 already exists, the required entries that are not present will be added. If CONFIG.S36 does not exist, the INSTALL command will create a CONFIG.S36 file with the necessary entries.

A LINK36.BAT file will be created in the specified directory to start PC Support/36. If a LINK36.BAT already exists, you will have a chance to rename the original LINK36.BAT with the name LINK36.BAK. If you chose to rename, and there is an existing LINK36.BAK file, it will be deleted.

A CONFIG.SYS file will be created in the root directory to start PC Support/36. If a CONFIG.SYS file already exists, the required entries will be added if they are not already present in the file (parameters on any existing DEVICE entries for VDSK.SYS, FSDDX.SYS, and FSDD.SYS will be deleted). If a CONFIG.SYS does not exist, then the INSTALL command will create a CONFIG.SYS file with the necessary entries to start PC Support/36.

You will be able to specify what additional PC Support/36 programs are being used in order to tailor your CONFIG.SYS, CONFIG.S36, and LINK36.BAT files.

## **Prerequisites**

You must have received a copy of the PC Support/36 installation diskette and information form from your Personal Computer Technical Coordinator.

The following must be installed on your fixed disk:

- DOS 3.1 or higher

## To Start Installation

- Make sure DOS is running.
- Insert the install diskette in drive A.
- Type the following:

**A:INSTALL F**

On the following display, select option 3, then press the Enter key.

SYSTEM/36 - PC ATTACHMENT

Select type of attachment:

1. Emulation
2. IBM Token-Ring Network
3. 5364 System Console

Select ==> 3

---

Enter Esc=Quit

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Follow the instructions on the subsequent displays and enter the information from the form when requested.

When the installation is complete, an "Installation Complete" display will appear.

## To Complete Installation

- Remove the install diskette from drive A.
- Restart the personal computer by pressing the following keys at the same time:

**CTRL ALT DEL**

- Type the following:

**d:\dir\LINK36**

where:

**d:** is the fixed disk drive specified during INSTALL.

**dir** is the PC Support/36 directory specified during INSTALL.

## After Installation

When the installation process is complete, the following files will contain the indicated statements:

*Note: In the following files, the term `d:\dir\` may precede `LINK36`, `VDSK.SYS`, `FSDDX.SYS`, and `FSDD.SYS`,*

*where:*

*`d:` is the name of the specified fixed disk drive.*

*`dir` is the name of a specified directory on the fixed disk drive.*

*For example, if you are using a fixed disk drive named `C` and a directory named `PCS36`, the statement would appear as:*

*`C:\PCS36\LINK36`*

## **CONFIG.SYS**

**DEVICE = VDSK.SYS**

If the PC Support/36 Organizer or the PC Support/36 shared folders facility is being used, the following entries will be added:

**DEVICE = FSDDX.SYS**

**DEVICE = FSDD.SYS**

## **CONFIG.S36**

**SUPPORT/36**

**RTYP 5250**

**VDSK I,#IWPCLD2,3**

## LINK36.BAT

```
d:  
CD \dir  
STARTRTR.EXE  
ECHO OFF  
IF ERRORLEVEL 20 GOTO EXIT  
ECHO ON  
CFGVDSK.COM  
ECHO OFF  
IF ERRORLEVEL 20 GOTO EXIT
```

If you are using the PC Support/36 Organizer, the following entries will be added:

```
ECHO ON  
I:  
FSPC ASSIGN  
ECHO OFF  
IF ERRORLEVEL 20 GOTO EXIT  
ECHO ON  
PCO.EXE  
I:  
FSPC RELEASE *  
ECHO OFF  
:EXIT  
ECHO ON
```

If you are not using the PC Support/36 Organizer, the following entries will be added at the end of the file:

```
I:  
:EXIT  
ECHO ON
```

# 5364 System Console/Diskette

## Overview

The goal of the installation process is to make it as easy as possible for you to access PC Support/36 programs. Through a series of interactive displays, you will provide the necessary information to install PC Support/36. After completing the installation, you need only restart your personal computer and optionally start the emulation program and LINK36 to access the PC Support/36 programs you want to use.

The result of the installation will be a working diskette (you may label it PC Support/36 LINK36 diskette) containing all the necessary programs to access PC Support/36, and an updated PC DSKT04 diskette.

The INSTALL command will run INSTDK.COM to create or copy the following files to your working diskette:

CFGVDSK.COM  
STARTRTR.EXE  
5250RTR.EXE  
STOPRTR.EXE  
FSDDX.SYS  
FSDD.SYS  
CONFIG.S36  
CONFIG.SYS  
LINK36.BAT



The following files will be copied to the PC DSKT04 working diskette:

VDSK.SYS

FSDDX.SYS

FSDD.SYS

CONFIG.SYS

You will be able to specify what additional PC Support/36 programs are being used in order to tailor your CONFIG.SYS, CONFIG.S36, and LINK36.BAT files.

## **Prerequisites**

You must have received a copy of the PC Support/36 installation diskette and information form from your Personal Computer Technical Coordinator.

You will need the following:

1. A diskette containing DOS 3.1 or higher
2. A formatted diskette (FORMAT /S; refer to your DOS manual if needed)
3. The PC DSKT04 working diskette

# To Start Installation

- Make sure DOS is running.
- Insert the install diskette in drive A.
- If you have a personal computer with one diskette drive, type:

**A:INSTALL D1**

- If you have a personal computer with two diskette drives, type:

**A:INSTALL D2**

*Note: Insert the formatted diskette in drive B.*

The following display will appear:

```
-----INSTALLING PC SUPPORT/36 TO DISKETTE-----  
To install PC Support/36 on a diskette-based personal computer,  
you will need to have the following diskettes available:  
  
  1. A formatted diskette (FORMAT /S)  
  2. A diskette containing either the emulation program or the  
     IBM Token-Ring Network Adapter Support Interface program  
     OR  
     Your PC DSKTO4 working diskette, if you are installing on  
     the 5364 System console  
  
If you do not have these available, press Esc to end the instal-  
lation, obtain the necessary diskettes, and then restart INSTALL.  
  
REMINDER: Be sure that you have your copy of the PC Support/36  
Install Form filled out by your Personal Computer Technical  
Coordinator.  
  
-----  
Enter      Esc=Quit  
-----Version 03.20 (c) IBM Corp. 1987-----
```

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After reading the instructions on the display, press the Enter key.

The following display will appear. Select option 3, then press the Enter key.

```
-----SYSTEM/36 - PC ATTACHMENT-----  
  
Select type of attachment:  
  1. Emulation  
  2. IBM Token-Ring Network  
  3. 5364 System Console  
  
Select ==> 3  
  
-----  
Enter  Esc=Quit                               Version 04.00 (c) IBM Corp. 1987
```

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Follow the instructions on the subsequent displays and enter the information from the form when requested.

When the installation is complete, an "Installation Complete" display will appear.

## **To Complete Installation**

- Insert the formatted diskette in drive A.
- Restart the personal computer by pressing the following keys at the same time:

**CTRL ALT DEL**

- Type: **LINK36**

## **After Installation**

When the installation process is complete, the following files will contain the indicated statements:

### **CONFIG.SYS**

**DEVICE = VDSK.SYS**

If the PC Support/36 Organizer or the PC Support/36 shared folders facility is being used, the following entries will be added:

**DEVICE = FSDDX.SYS**

**DEVICE = FSDD.SYS**

### **CONFIG.S36**

**SUPPORT/36**

**RTYP 5250**

**VDSK I,#IWPCLD2,3**

## **LINK36.BAT**

```
STARTRTR.EXE
ECHO OFF
IF ERRORLEVEL 20 GOTO EXIT
ECHO ON
CFGVDSK.COM
ECHO OFF
IF ERRORLEVEL 20 GOTO EXIT
```

If the PC Support/36 Organizer is being used, the following entries will be added:

```
ECHO ON
I:
FSPC ASSIGN
ECHO OFF
IF ERRORLEVEL 20 GOTO EXIT
ECHO ON
PCO.EXE
I:
FSPC RELEASE *
ECHO OFF
:EXIT
ECHO ON
```

If you are not using the PC Support/36 Organizer, the following entries will be added at the end of the file:

```
I:
:EXIT
ECHO ON
```

# Copying the PC Support/36 Programs

You do not have to run the PC Support/36 programs from the virtual I drive. If you prefer to use one or more of the PC Support/36 programs from a diskette or fixed disk, or if you intend to use one or more of the programs frequently, you can copy them to a personal computer diskette or fixed disk.

Starting the PC Support/36 programs from a personal computer diskette or fixed disk is faster than starting them from the I drive. This is especially true if you are using your personal computer as a remote display station.

Whether you copy any of the PC Support/36 programs to a personal computer diskette or fixed disk is up to you. If you choose to do this, you need only copy the program or programs you plan to use often.

You should copy the PC Support/36 programs either to the PC Support/36 directory, or another directory containing the CONFIG.S36 file created during installation.

All of the PC Support/36 programs will not fit on one 360K byte diskette. However, you can copy different programs to different diskettes. For example, you might want to copy the virtual printer and virtual disk programs on one diskette, the System/36-to-personal computer transfer facility programs on another diskette, and the personal computer-to-System/36 transfer facility programs on a third diskette.

*Note: If you want to copy the PC Support/36 programs to a specific directory on a disk, change the directory of the disk before copying the programs.*

If you want to copy one or more of the PC Support/36 programs, make sure you have one or more formatted diskettes ready. If you want to start your personal computer from a diskette containing one or more of the PC Support/36 programs, you should format them using the /S parameter on the DOS FORMAT command. (The /S parameter tells DOS to copy the operating system files to the diskette being formatted.)

For details on how to format a diskette, refer to your *IBM Personal Computer Disk Operating System* manual.

You might also want to copy the 5250 Emulation Program to the disk or diskette on which you plan to copy the PC Support/36 programs. To do this, you can use the DOS COPY command.



# Copying the Virtual Disk Facility Programs

To copy the virtual disk facility programs, do the following:

1. Make sure the default drive is set to I, then type the following command:

**COPYVDSK d:**

where **d:** is the drive on which you are copying the programs. Press the Enter key. This copies the programs necessary to run the virtual disk facility to your diskette or fixed disk.

2. Verify the contents of the diskette or fixed disk by typing:

**DIR d:**

where **d:** is the drive on which you copied the programs. The diskette or fixed disk should contain the following:

CONFIG.SYS  
STARTRTR.EXE  
STOPRTR.EXE  
5250RTR.EXE  
ITRNRTR.EXE  
VDSK.SYS  
CFGVDSK.COM  
SETVDSK.COM  
ISETVDSK.BAT

A CONFIG.SYS file has been created for you in the current directory of the drive specified on the COPYVDSK command. It contains a DEVICE = VDSK.SYS entry. If you already had a CONFIG.SYS file on the current directory, one of the following occurred:

- The DEVICE entry is added to the existing CONFIG.SYS file if the DEVICE entry had not previously been placed in the CONFIG.SYS file by PC Support/36.
- The DEVICE entry is not duplicated in the CONFIG.SYS file if PC Support/36 had previously placed the DEVICE entry in the CONFIG.SYS file.

*Note: Before you can use the virtual disk facility, the CONFIG.SYS file must be on the drive and directory from which you start or restart your personal computer. The VDSK.SYS file must be on the same drive, but may be in a directory other than the root directory. If you put this program in a directory other than the root directory, you must modify the DEVICE = statement in the CONFIG.SYS file to show the path to the directory. For information on how to use the virtual disk facility, refer to Chapter 5, "Using the PC Support/36 Virtual Disk Facility" in the PC Support/36 User's Guide.*

# Copying the Virtual Printer Facility Programs

To copy the virtual printer facility programs, do the following:

1. Make sure the default drive is set to I, then type the following command:

**COPYVPRT d:**

where **d:** is the drive on which you want to copy the programs. Press the Enter key. This copies the programs necessary to run the virtual printer facility to your personal computer diskette or fixed disk.

2. Verify the contents of the diskette or fixed disk by typing:

**DIR d:**

where **d:** is the drive on which you copied the programs. The diskette or fixed disk should contain the following:

STARTRTR.EXE  
STOPRTR.EXE  
5250RTR.EXE  
ITRNRTR.EXE  
VPRT.COM  
CFGVPRT.COM  
SETVPRT.COM  
ISETVPRT.BAT

*Note: Before you can use the virtual printer facility, you must install VPRT.COM by typing the VPRT command. For details, refer to Chapter 7, "Using the PC Support/36 Virtual Printer Facility," in the PC Support/36 User's Guide.*

# Copying the Transfer Facility Programs

The transfer facility consists of two sets of programs:

- The System/36-to-personal computer transfer facility programs
- The personal computer-to-System/36 transfer facility programs

If you are copying these programs to diskettes, you should be aware that each set of transfer facility programs requires a 360K byte diskette. This means that, to copy both sets of transfer facility programs, you will need two formatted 360K byte diskettes.

# Copying the System/36-to-Personal Computer Transfer Facility Programs

To copy the System/36-to-personal computer transfer facility programs, do the following:

1. Make sure the default drive is set to I, then type the following command:

**COPYTTO d:**

where **d:** is the drive on which you want to copy the programs. Press the Enter key. This copies the programs necessary to run the System/36-to-personal computer transfer facility programs to your diskette or fixed disk.

2. Verify the contents of the diskette or fixed disk by typing:

**DIR d:**

where **d:** is the drive on which you copied the programs. The diskette or fixed disk should contain the following:

STARTRTR.EXE  
STOPRTR.EXE  
5250RTR.EXE  
ITRNRTR.EXE  
STF.COM  
RTOPC.EXE  
RTOPCB.EXE  
TOPC.BAT  
TOPCB.BAT

# Copying the Personal Computer-to-System/36 Transfer Facility Programs

To copy the personal computer-to-System/36 transfer facility programs, do the following:

1. Make sure the default drive is set to I, then type the following command:

**COPYTFR d:**

where **d:** is the drive on which you want to copy the programs. Press the Enter key. This copies the programs necessary to run the personal computer-to-System/36 transfer facility programs to your diskette or fixed disk.

2. Verify the contents of the diskette or fixed disk by typing:

**DIR d:**

where **d:** is the drive on which you copied the programs. The diskette or fixed disk should contain the following:

STARTRTR.EXE  
STOPRTR.EXE  
5250RTR.EXE  
ITRNRTR.EXE  
STF.COM  
RFROMPC.EXE  
RFROMPCB.EXE  
FROMPC.BAT  
FROMPCB.BAT

# Copying the Shared Folders Programs

To copy the shared folders programs, do the following:

1. Make sure the default drive is set to I, then type the following command:

**COPYFSPC d:**

where **d:** is the drive on which you are copying the programs. Press the Enter key. This copies the programs necessary to run shared folders to your diskette or fixed disk.

2. Verify the contents of the diskette or fixed disk by typing:

**DIR d:**

where **d:** is the drive on which you copied the programs. The diskette or fixed disk should contain the following:

CONFIG.SYS  
STARTRTR.EXE  
5250RTR.EXE  
ITRNRTR.EXE  
STOPRTR.EXE  
FSDDX.SYS  
FSDD.SYS  
FSPC.EXE

A CONFIG.SYS file has been created for you in the current directory of the drive specified on the COPYFSPC command. It contains a DEVICE = FSDDX.SYS entry and a DEVICE = FSDD.SYS entry. If you already had a CONFIG.SYS file on the current directory, one of the following occurred:

- The DEVICE entries are added to the existing CONFIG.SYS file if the DEVICE entries have not previously been placed in the CONFIG.SYS file by PC Support/36.
- The DEVICE entries are not duplicated in the CONFIG.SYS file if PC Support/36 had previously placed the DEVICE entries in the CONFIG.SYS file.

*Notes:*

1. *Before you can use the shared folders facility, the CONFIG.SYS files must be on the drive and directory from which you start or restart your personal computer. The FSDDX.SYS and FSDD.SYS files must be on the same drive, but may be in a directory other than the root directory. If you put these programs in a directory other than the root directory, you must modify the DEVICE= statement in CONFIG.SYS to show the path to this directory. For information on how to use shared folders, refer to Chapter 6, "Using the PC Support/36 Shared Folders Facility," in the PC Support/36 User's Guide.*
2. *If you do not want to use the virtual disk facility, you can remove the VDSK entry from CONFIG.S36 and the DEVICE = VDSK.SYS entry from CONFIG.SYS before you restart your personal computer.*



# Copying the Organizer Programs

To copy the Organizer programs, do the following:

1. Make sure the default drive is set to I, then type the following command:

**COPYMENU d:**

where **d:** is the drive on which you are copying the programs. Press the Enter key. This copies the programs necessary to run the Organizer to your diskette or fixed disk.

2. Verify the contents of the diskette or fixed disk by typing:

**DIR d:**

where **d:** is the drive on which you copied the programs. The diskette or fixed disk should contain the following:

CONFIG.SYS  
CONFIG.S36  
STARTRTR.EXE  
5250RTR.EXE  
ITRNRTR.EXE  
STOPRTR.EXE  
VDSK.SYS  
FSDDX.SYS  
FSDD.SYS  
CFGVDSK.COM  
FSPC.EXE  
PCO.EXE  
WSFTEXT.EXE  
5250TEXT.EXE  
STOPTEXT.EXE  
STARTMNU.BAT

A CONFIG.SYS file has been created for you in the current directory of the drive specified on the COPYMENU command. It contains DEVICE = VDSK.SYS, DEVICE = FSDDX.SYS, and DEVICE = FSDD.SYS entries. If you already had a CONFIG.SYS file on the current directory, one of the following occurred:

- The DEVICE entries are added to the existing CONFIG.SYS file if the DEVICE entries have not previously been placed in the CONFIG.SYS file by PC Support/36.
- The DEVICE entries are not duplicated in the CONFIG.SYS file if PC Support/36 had previously placed the DEVICE entries in the CONFIG.SYS file.

*Note: Before you can use the Organizer, the CONFIG.SYS, file must be on the drive and directory from which you start or restart your personal computer. The VDSK.SYS, FSDDX.SYS, and FSDD.SYS files must be on the same drive, but may be in a directory other than the root directory. If you put these programs in a directory other than the root directory, you must modify the DEVICE = statements in the CONFIG.SYS file to show the path to this directory. For information on how to use the Organizer, refer to Chapter 6, "Using the PC Support/36 Shared Folders Facility," in the PC Support/36 User's Guide.*

A CONFIG.S36 file has been created for you in the current directory of the drive specified on the COPYMENU command. It contains a VDSK entry to assign the virtual disk containing all the PC Support/36 programs to drive I. It also contains an HPRC MENU PCOMNU entry and a HPRC IWROUTER entry to start the Organizer menu.

If you already had a CONFIG.S36 file in the current directory, the VDSK and HPRC entries are added to the existing CONFIG.S36 file only if the HPRC MENU entry is not found.

*Note: If you do not want to use the virtual disk facility, you can remove the VDSK entry from CONFIG.S36, the DEVICE = VDSK.SYS entry from CONFIG.SYS, and the VDSK.SYS file, if present, before you restart your personal computer.*

# Copying the Message Facility Programs

To copy the message facility programs, do the following:

1. Make sure the default drive is set to I, then type the following command:

**COPYMSG d:**

where **d:** is the drive on which you want to copy the programs. Press the Enter key. This copies the programs necessary to run the message facility programs to your diskette or fixed disk.

2. Verify the contents of the diskette or fixed disk by typing:

**DIR d:**

where **d:** is the drive on which you copied the programs. The diskette or fixed disk should contain the following:

STARTRTR.EXE  
STOPRTR.EXE  
ITRNRTR.EXE  
STARTMSG.COM  
MSG.COM  
RCVMSG.COM  
STOPMSG.COM



# **PC Support/36 Install Forms**

This section contains the forms you need to install PC Support/36. It is recommended that you make a copy of the form that you need. Use the copy as a working form. This will save the book copy to be copied later if you need more copies of the form.



# Emulation/Fixed Disk

1. DOS 2.1 or higher must be running (see your DOS manual if you need assistance).
2. You must have the emulation program installed and properly configured on your fixed disk.
3. You must have received a copy of the PC Support/36 install diskette from your Personal Computer Technical Coordinator.
4. Insert the PC Support/36 install diskette in drive A.
5. Type **A:INSTALL F** and press the Enter key.
6. Turn this form over for the information necessary to install PC Support/36.
7. Follow the instructions on the "Installation Complete" display.



You will need to provide this information when you run the INSTALL command.

**System/36 - PC Attachment**

- 1. Emulation  X
- 2. IBM Token-Ring Network  \_\_\_\_\_
- 3. 5364 System Console  \_\_\_\_\_

**Fixed Disk Drive and Directory**

Fixed disk drive name \_\_\_\_\_  
PC Support/36 directory name \_\_\_\_\_

**Emulation Program**

- 1. DE5250.COM \_\_\_\_\_
- 2. DP5250.COM \_\_\_\_\_
- 3. RE5250.COM \_\_\_\_\_
- 4. RP5250.COM \_\_\_\_\_
- 5. Other \_\_\_\_\_

**Emulation Program Parameters (Optional)**

Parameters \_\_\_\_\_

**Additional Program Support**

- Organizer? 1 (Yes) 0 (No)
- Shared folders facility? 1 (Yes) 0 (No)

**LINK36 Batch File (Optional)**

Rename LINK36.BAT? 1 (Yes) 0 (No)

**AUTOEXEC Batch File (Optional)**

Create AUTOEXEC.BAT? 1 (Yes) 0 (No)

**Installation Complete**

Write down the instructions or press the Shift-PrtSc key to print the screen.

# Emulation/Diskette

1. You must have the following diskettes:
  - The PC Support/36 install diskette (see your Personal Computer Technical Coordinator)
  - A formatted diskette (FORMAT /S; see your DOS manual if you need assistance)
  - A working diskette containing the emulation program
2. DOS 2.1 or higher must be running (see your DOS manual if you need assistance).
3. Insert the PC Support/36 install diskette in drive A.
4. Type one of the following and press the Enter key:
  - A:INSTALL D1** (one diskette drive)
  - A:INSTALL D2** (two diskette drives)
5. If you typed *D2*, insert the formatted diskette in drive B.
6. Turn this form over for information necessary to install PC Support/36.
7. Follow the instructions on the “Installation Complete” display.

You will need to provide this information when you run the INSTALL command.

**System/36 - PC Attachment**

- 1. Emulation
- 2. IBM Token-Ring Network
- 3. 5364 System Console

**Emulation Program**

- 1. DE5250.COM
- 2. DP5250.COM
- 3. Other

**Emulation Program Parameters**

(DE5250.COM and DP5250.COM only)

Parameters \_\_\_\_\_

**Additional Program Support**

- Organizer? 1 (Yes) 0 (No)
- Shared folders facility? 1 (Yes) 0 (No)

**Installation Complete**

Write down the instructions or press the Shift-PrtSc key to print the screen.

S9097002-1

# IBM Token-Ring/Fixed Disk

1. DOS 3.2 or higher must be running (see your DOS manual if you need assistance).
2. You must have the IBM Token-Ring Network PC Adapter Support Interface program installed on your fixed disk.
3. You must have received a copy of the PC Support/36 install diskette from your Personal Computer Technical Coordinator.
4. Insert the PC Support/36 install diskette in drive A.
5. Type **A:INSTALL F** and press the Enter key.
6. Turn this form over for information necessary to install PC Support/36.
7. Follow the instructions on the "Installation Complete" display.

You will need to provide this information when you run the INSTALL command.

**System/36 - PC Attachment**

- 1. Emulation \_\_\_\_\_
- 2. IBM Token-Ring Network   X
- 3. 5364 System Console \_\_\_\_\_

**Fixed Disk Drive and Directory**

Fixed disk drive name \_\_\_\_\_  
PC Support/36 directory name \_\_\_\_\_

**IBM Token-Ring Network information:**

PC location name \_\_\_\_\_  
System/36 link name \_\_\_\_\_  
System/36 IBM Token-Ring Network  
adapter address \_\_\_\_\_

IBM Token-Ring Network program name  
\_\_\_\_\_

**Additional Program Support**

- Organizer? 1 (Yes) 0 (No)
- Shared folders facility? 1 (Yes) 0 (No)
- Work Station Feature? 1 (Yes) 0 (No)

**LINK36 Batch File** (Optional)

Rename LINK36.BAT? 1 (Yes) 0 (No)

**AUTOEXEC Batch File** (Optional)

Create AUTOEXEC.BAT? 1 (Yes) 0 (No)

**Installation Complete**

Write down the instructions or press the  
Shift-PrtSc key to print the screen.

# IBM Token-Ring/Diskette

1. You must have the following diskettes:
  - The PC Support/36 install diskette (see your Personal Computer Technical Coordinator)
  - A formatted diskette (FORMAT /S; see your DOS manual if you need assistance)
  - A diskette containing the IBM Token-Ring Network PC Adapter Support Interface program
2. DOS 3.2 or higher must be running (see your DOS manual if you need assistance).
3. Insert the PC Support/36 install diskette in drive A.
4. Type one of the following and press the Enter key:
  - A:INSTALL D1** (one diskette drive)
  - A:INSTALL D2** (two diskette drives)
5. If you typed *D2*, insert the formatted diskette in drive B.
6. Turn this form over for information necessary to install PC Support/36.
7. Follow the instructions on the "Installation Complete" display.

You will need to provide this information when you run the INSTALL procedure.

**System/36 - PC Attachment**

- 1. Emulation \_\_\_\_\_
- 2. IBM Token-Ring Network   X
- 3. 5364 System Console \_\_\_\_\_

**IBM Token-Ring Network information:**

PC location name \_\_\_\_\_

System/36 link name \_\_\_\_\_

System/36 IBM Token-Ring Network  
adapter address \_\_\_\_\_

IBM Token-Ring Network program name  
\_\_\_\_\_

**Additional Program Support**

Organizer? 1 (Yes) 0 (No)

Shared folders facility? 1 (Yes) 0 (No)

Work Station Feature? 1 (Yes) 0 (No)

**Installation Complete**

Write down the instructions or press the  
Shift-PrSc key to print the screen.

S9097004-1

# 5364 System Console/Fixed Disk

1. DOS 3.1 or higher must be running (see your DOS manual if you need assistance).
2. You must have received a copy of the PC Support/36 install diskette from your Personal Computer Technical Coordinator.
3. Insert the PC Support/36 install diskette in drive A.
4. Type **A:INSTALL F** and press the Enter key.
5. Turn this form over for the information necessary to install PC Support/36.
6. Follow the instructions on the "Installation Complete" display.



You will need to provide this information when you run the INSTALL command.

**System/36 - PC Attachment**

- 1. Emulation \_\_\_\_\_
- 2. IBM Token-Ring Network \_\_\_\_\_
- 3. 5364 System Console   X

**Fixed Disk Drive and Directory**

Fixed disk drive name \_\_\_\_\_  
PC Support/36 directory name \_\_\_\_\_

**Additional Program Support**

Shared folders facility?           1 (Yes) 0 (No)

**LINK36 Batch File**

(Optional)

Rename LINK36.BAT?               1 (Yes) 0 (No)

**Installation Complete**

Write down the instructions or press the Shift-PrtSc key to print the screen.

## 5364 System Console/Diskette

1. You must have the following diskettes:
  - The PC Support/36 install diskette (see your Personal Computer Technical Coordinator)
  - A formatted diskette (FORMAT /S, see your DOS manual if you need assistance)
  - The PC DSKT04 working diskette
2. DOS 3.1 or higher must be running (see your DOS manual if you need assistance).
3. Insert the PC Support/36 install diskette in drive A.
4. Type one of the following and press the Enter key:

**A:INSTALL D1** (one diskette drive)

**A:INSTALL D2** (two diskette drives)
5. If you typed *D2*, insert the formatted diskette in drive B.
6. Turn this form over for information necessary to install PC Support/36.
7. Follow the instructions on the "Installation Complete" display.

You will need to provide this information when you run the INSTALL command.

**System/36 - PC Attachment**

- 1. Emulation \_\_\_\_\_
- 2. IBM Token-Ring Network \_\_\_\_\_
- 3. 5364 System Console   X

**Additional Program Support**

Shared folders facility?                    1 (Yes) 0 (No)

**Installation Complete**

Write down the instructions or press the Shift-PrtSc key to print the screen.

# Chapter 2. The PC Support/36 Configuration File

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# Description

The PC Support/36 configuration file (CONFIG.S36) is a personal computer file that contains special user information for PC Support/36 programs. This file allows you to customize PC Support/36 for your own use.

You are not required to have the configuration file for most PC Support/36 programs. However, you must have a configuration file when using the LINK36 support, the IBM Token-Ring Network router, PC Support/36 Organizer, or any special operating environment and need to override certain defaults used by PC Support/36.

For example, you may want to automatically assign a set of virtual disks every time you power on or restart your personal computer. Or, you may want to automatically assign virtual printers.

*Note: If you have taken the proper options when you did the INSTALL command, the necessary configuration files have been modified or created.*

# Creating the CONFIG.S36 File

The CONFIG.S36 file is an ASCII text file with a simple format. To create and modify this file, you must use a personal computer text editor, such as EDLIN or Personal Editor, or the DOS COPY command.

For example, to use the DOS COPY command to create a CONFIG.S36 file, after the DOS prompt you would type:

**COPY CON CONFIG.S36**

Press the Enter key, followed by any entries you want to include in the CONFIG.S36 file. Make sure that you press the Enter key after each entry that you type.

*Note: Using the DOS COPY command replaces the existing CONFIG.S36 file, if any, with what is currently being copied.*

If you want to modify the existing CONFIG.S36 file, you would type:

**COPY CONFIG.S36 + CON CONFIG.S36**

Press the Enter key, followed by any entries you want to include in the CONFIG.S36 file. Make sure that you press the Enter key after each entry that you type.

When you are finished typing entries for the CONFIG.S36 file, do the following:

1. Make sure that you press the Enter key after the last entry you typed. This causes a carriage return and a line feed character to be placed after the last line you typed.
2. Press the F6 key.
3. Press the Enter key again.

# CONFIG.S36 File Format

The CONFIG.S36 file contains any number of variable-length records separated by a carriage return (hexadecimal 0D) and line feed (hexadecimal 0A) characters. The end of the file is marked by an end of file marker (hexadecimal 1A).

The first record of the CONFIG.S36 file must be the following header record:

## **Support/36**

This record identifies the file as a CONFIG.S36 configuration file. All other records in the file can appear in any order. These records are actions to be taken by one or more of the PC Support/36 programs. These records must be entered in the following format:

### **xxxx parameter values**

Where **xxxx** is a record identifier indicating the function to be performed by the record. For example, the record identifier used for specifying the PC Support/36 router interrupt level is INTL. The record identifier must be the first 4 characters of the record, and must be separated from the parameter values by a blank.



The parameters specify the value or values you want to use for a particular entry. The value you can specify depends on the record identifier you are using. For example, to change the PC Support/36 router interrupt level to hexadecimal 6D, the record in the CONFIG.S36 file would be:

**INTL 6D**

The PC Support/36 router then uses this value entered in the CONFIG.S36 file.

The format of the CONFIG.S36 file is an easy-to-use, free format. Alphabetic characters can be entered in uppercase, lowercase, or in a mixture of uppercase and lowercase.

Control characters less than hexadecimal 20 are treated as blanks with the following exceptions:

Carriage return

End of file

Line feed

Tab characters

# CONFIG.S36 Entries

This section describes the valid entries and identifiers that can be defined in the CONFIG.S36 file. Records in the CONFIG.S36 file that do not begin with recognized identifiers are ignored, and can be used as comment lines. However, it is recommended that you use an asterisk (\*) as the first character of a comment line.

The following tables describe the entries you can include in the CONFIG.S36 file for each portion of PC Support/36. Detailed descriptions of these entries can be found in alphabetical order later in this chapter.

## PC Support/36 Router Entries

The following table shows the entries you can include in the CONFIG.S36 file or an alternate configuration file for the PC Support/36 routers:

Entries common to both routers:

<b>Entry</b>	<b>Description</b>
A2ET	Change default ASCII to EBCDIC translation table
INTL	PC Support/36 router interrupt vector
RTYP	Router type

5250 only entries:

<b>Entry</b>	<b>Description</b>
EMLI	Remote system name
EMSN	Emulation session number
HPRC	System/36 router procedure name
OFFP	System/36 sign-off procedure name

Token-Ring only entries:

<b>Entry</b>	<b>Description</b>
TRAN	Token-Ring adapter number
TRAL	Number of additional links
TRAS	Number of additional SAP stations
TRDL	Token-Ring default link name
TRLI	Link information specific to a link
TRLN	Token-Ring router location name
TRRL	Maximum number of links
TRSS	Token-Ring source SAP value

## Virtual Disk Facility Entries

The following table shows the entries you can include in the CONFIG.S36 file for the virtual disk facility:

<b>Entry</b>	<b>Description</b>
A2ET	Change default ASCII to EBCDIC translation table
DSPL	Display type and/or speed used with color adapter
E2AT	Change default EBCDIC to ASCII translation table
VDSK	Configure virtual disk assignments

## Virtual Printer Facility Entries

The following table shows the entries you can include in the CONFIG.S36 file for the virtual printer facility:

<b>Entry</b>	<b>Description</b>
AEP1, AEP2, AEP3	Change default ASCII to EBCDIC translation table for virtual print files
A2ET	Change default ASCII to EBCDIC translation table
DSPL	Display type and/or speed used with color adapter
E2AT	Change default EBCDIC to ASCII translation table
VPRT	Configure virtual printer assignments

## Transfer Facility Entries

The following table shows the entries you can include in the CONFIG.S36 file for the transfer facility:

Entry	Description
A2ET	Change default ASCII to EBCDIC translation table
DSPL	Display type and/or speed used with color adapter
E2AT	Change default EBCDIC to ASCII translation table
PCSI	PC Support/36 interrupt vector

## Translation Table Utility Entries

The following table shows the entries you can include in the CONFIG.S36 file for the translation table utility:

Entry	Description
DSPL	Display type and/or speed used with color adapter

## Message Facility Entries

The following table shows the entries you can include in the CONFIG.S36 file or the message facility alternate configuration file:

<b>Entry</b>	<b>Description</b>
A2ET	Change default ASCII to EBCDIC translation table
DSPL	Display type and/or speed used with color adapter
E2AT	Change default EBCDIC to ASCII translation table
MDEF	Identifies the System/36 that messages are sent to and received from and the session mode
MMRI	Message receive interval
MTIM	Message window time-out value
PCSI	PC Support/36 interrupt vector

# AEP1, AEP2, and AEP3

These entries allow you to change the ASCII to EBCDIC translation tables used by a virtual printer when translating personal computer printer output to System/36 format. When you specify one of these entries, you must use the following format:

**AEPn [d:][path]*filename.ext***

where:

**n** is 1, 2, or 3 and:

**AEP1** corresponds to the virtual printer LPT1

**AEP2** corresponds to the virtual printer LPT2

**AEP3** corresponds to the virtual printer LPT3

**d:** specifies the name of the disk or diskette drive where the file containing the ASCII to EBCDIC translation table is located. The drive is required only if the file containing the translation table is not in the default drive.

**path** specifies a path of directory names. Type the directory names separated by backslashes (\).

***filename.ext*** is the personal computer file containing the translation table to be used. This file was created using the translation table utility. (Refer to Chapter 7, “The Translation Table Utility.”)

You can specify a different ASCII to EBCDIC translation table for each of the virtual printers specified. If these entries are in the CONFIG.S36 file when the virtual printer program VPRT.COM is run, the translation tables found in the named files will be used instead of the default translation tables.

For more details about virtual printers LPT1, LPT2, and LPT3, refer to Chapter 7, “Using the PC Support/36 Virtual Printer Facility,” in the *PC Support/36 User’s Guide*.



# A2ET

This entry allows you to change the ASCII to EBCDIC translation table used by the router, virtual disk, virtual printer, message facility, and transfer facility programs. The format for this entry is:

**A2ET [d:][path]*filename.ext***

where:

**d:** specifies the name of the disk drive where the file containing the ASCII to EBCDIC translation table is located. Type a letter followed by a colon to specify the drive. The drive is required only if the file containing the translation table is not in the default drive.

**path** specifies a path of directory names. Type the directory names followed by backslashes (\).

***filename.ext*** is the personal computer file containing the translation table to be used. This file was created using the translation table utility. (Refer to Chapter 7, "The Translation Table Utility.")

If this entry is in the CONFIG.S36 file when STARTRTR.EXE, CFGVDSK.COM, SETVDSK.COM, CFGVPRT.COM, SETVPRT.COM, STARTMSG.COM, MSG.COM, or STF.COM is run, the translation table found in the specified file is used instead of the default translation table.

# DSPL

This entry specifies whether you have a monochrome or color display attached to a color/graphics adapter card and whether to use high-speed or slow-speed display writing when using a graphics adapter. This entry tells a PC Support/36 program what attributes to send to your display. Using the wrong attributes makes the display difficult to read.

You need to specify this entry only if you are using a monochrome monitor attached to a graphics adapter card. If you are using a monochrome display and printer adapter card, this entry is ignored. When you specify the DSPL entry, you must use the following format:

**DSPL xy**

where:

**x** specifies the type of monitor being used. It is either an uppercase or lowercase C for a color display, or an uppercase or lowercase M for a monochrome display. If this value is specified on any of the interactive PC Support/36 commands or STARTMSG.COM, that value overrides the value specified in the CONFIG.S36 file.

**y** specifies the display writing speed. It is either an uppercase or lowercase H for high-speed display writing, or an uppercase or lowercase S for slow-speed display writing. If the speed parameter is not specified, slow-speed display writing will be used with all graphic adapter cards except the Enhanced Graphics Adapter.

For more information on using the correct display attributes, refer to Chapter 2, "What You Should Know before Operating PC Support/36," in the *PC Support/36 User's Guide*.

# EMLI

This entry allows you to specify a remote system name for PC Support/36 applications.

The format of this entry is:

## **EMLI remote system name**

where:

**remote system name** indicates the System/36 which is running the requested application.

Valid characters for the System/36 are:

- 0 through 9
- A through Z
- #
- \$
- @

The System/36 name field cannot start with a number or contain imbedded blanks.

*Note: In some code the hexadecimal equivalent for #, \$, and @ may be different characters. The # is equal to hexadecimal 7B, the \$ is equal to hexadecimal 5B, and the @ is equal to hexadecimal 7C.*

If the shared folders facility specifies a remote system name, it will override the name specified by this entry in CONFIG.S36 or the alternate configuration file.

If this entry is not in CONFIG.S36 or the alternate configuration file and the requested application does not specify a name, the application will be run on the same System/36 as the System/36 router.

This entry is needed to run PC Support/36 pass-through. It is only processed by the 5250 router.

Applications such as virtual disk, virtual printer, and transfer facility that do not specify a remote system name may still access a remote system if this entry is included in the router configuration file when STARTRTR is run.

See Chapter 3, "The PC Support/36 Routers," for more information on how to use PC Support/36 pass-through.

If multiple EMLI entries are in the configuration file, the last entry will be used.

# EMSN

This is the emulator session number. This parameter applies only if you are using emulation, remote emulation, or a personal computer attached as the console to the 5364 System Unit which supports more than one session. When you specify this entry, you must use the following format:

**EMSN x**

where:

x is the session number from which the router should be started. Valid session numbers are 1 through 4. If this parameter is not specified, the default is 1.

If the value you specify is not valid, the router ends and an error message is displayed. If you are not using an emulation program or a remote emulation program, this parameter is ignored.

Once the router has been installed, changes to the EMSN entry will not be effective until you restart your personal computer.

If multiple EMSN entries are in the configuration file, the last entry will be used.

# E2AT

This entry allows you to change the EBCDIC to ASCII translation table used by the virtual disk, virtual printer, message facility, and transfer facility programs. The format of this entry is:

**E2AT [d:][path]*filename.ext***

where:

**d:** specifies the name of the disk drive where the file containing the EBCDIC to ASCII translation table is located. Type a letter followed by a colon to specify the drive. The drive is required only if the file containing the translation table is not in the default drive.

**path** specifies a path of directory names. Type the directory names followed by backslashes (\).

***filename.ext*** is the personal computer file containing the translation table to be used. This file was created using the translation table utility. (Refer to Chapter 7, "The Translation Table Utility.")

If this entry is in the CONFIG.S36 file when STARTMSG.COM, SETVDSK.COM, CFGVDSK.COM, SETVPRT.COM, CFGVPRT.COM, STF.COM, MSG.COM or RCVMSG.COM is run, the translation table found in the specified file is used instead of the default translation table.

# HPRC

This is the System/36 router procedure name. The personal computer router program automatically attempts to start the System/36 router program using the System/36 procedure IWROUTER. If you need to change the method of starting the System/36 router program, you should use this entry.

The format of this entry is:

**HPRC x**

where:

**x** is a System/36 procedure name or option number.

You should specify the new procedure name or menu option here if:

- You have changed the procedure name
- You want to run your own procedure for accounting or security reasons
- You have a mandatory menu
- You want to run the Organizer

You can have more than one HPRC entry in the CONFIG.S36 file or alternate configuration file to create a sequence of commands or procedures. The PC Support/36 router processes each entry by automatically entering the characters for that entry on the System/36 command display. The total number of characters in the HPRC entries, including enter keys appended by the router, cannot be greater than 256.

For example, if your System/36 is set up so that, after signing on, you receive a main menu on which option 3 displays your own menu and option 10 on your own menu runs the IWROUTER procedure, you could include two HPRC entries as follows:

**HPRC 3**  
**HPRC 10**

The characters specified for each entry are converted to uppercase. They are then checked to make sure they are valid characters for System/36 commands or procedures.

*Note: The last HPRC entry must contain the correct procedure or menu option to start the System/36 router. Once the System/36 router has been started, all subsequent HPRC entries are ignored.*



# INTL

This is the software interrupt vector used by PC Support/36 applications when communicating with the router. You can change this number if the default, hexadecimal 68, is used by another program you are using on the personal computer. The format for this entry is:

## INTL x

where:

**x** is a value from hexadecimal 60 to hexadecimal 7F. If the value is not valid, the router ends and an error message is displayed.

### *Notes:*

- 1. If you want to change the interrupt level, it is recommended that you do not change it to a value from hexadecimal 70 through hexadecimal 7F if you are using an IBM 5170 PERSONAL COMPUTER AT<sup>®</sup>, because the values from hexadecimal 70 through hexadecimal 7F are used by the computer.*
- 2. If the router interrupt level is being used by an application, the router will override the application and no error or warning message will be displayed.*

If multiple INTL entries are in the configuration file, the last entry will be used.

# MDEF

This entry allows you to identify the System/36 you want to control your messages. It also allows you to specify if you want your messages immediately or just be notified that there are messages waiting.

The format is:

**MDEF [System/36 name] [,session mode]**

where:

**System/36 name** specifies the name of the host System/36 you want to interact with for your messages. This is an optional parameter. If no System/36 name is specified, then the PC Support/36 router default System/36 will be used.

The System/36 name must meet the same naming criteria as remote system name on the EMLI entry.

For additional information on **System/36 name** and its relationship to link name and remote system name, refer to the section on "Multiple Systems" in Chapter 3, "The PC Support/36 Routers."

**session mode** specifies the message control mode for the System/36. This is an optional parameter. If the session mode is specified, it must be one of the following:

- 1 Notify mode

If you specify Notify mode, you will receive an audible alarm that you have messages waiting.

- 2 Immediate mode

If you specify Immediate mode, the application presently running will be stopped and a window that contains the message(s) will be displayed. After you have exited the message window, the contents of the display will be restored and the application will continue.

If no mode is specified, Notify (1) is the default.

For more detailed information on Notify and Immediate modes, refer to Chapter 9, "The PC Support/36 Message Facility."

*Note: The System/36 name and the session mode are separated by a comma. If the System/36 name is left blank, the session mode parameter must be preceded by a comma. If the System/36 name is entered and the session mode is left blank, the comma is not needed.*

If you automatically start the message facility from a AUTOEXEC.BAT file and there is no MDEF parameter in the configuration file, you will interact with the default System/36 in Notify mode.

For example, if you wanted to use SystemA as the System/36 name with a Receive Session mode of Immediate, the entry in the configuration file would be:

**MDEF SystemA,2**

# MMRI

This entry allows you to specify the message receive interval. This establishes how often the resident code will poll the System/36 for messages. This is an optional identifier. If no identifier is specified, the default value of 60 seconds is used.

The format is:

**MMRI [seconds]**

where:

**seconds** specifies the amount of time between polls of the System/36. This is an optional parameter. If no time is specified, the default value of 60 seconds is used. A value of 1 to 3600 seconds (1 hour) is allowed. If there are multiple MMRI entries in the configuration file, the last entry will be the one used by your system.

For example, if you want the System/36 polled every 30 seconds, the configuration file entry is:

**MMRI 30**

*Note: A small MMRI could impact performance of other applications on your personal computer. This is caused by messages being automatically retrieved more often. If you would like messages more often, then use a small MMRI value. If performance is a concern, then a large MMRI is recommended.*

# MTIM

This allows you to specify how long the message window will appear on your display. This is an optional parameter. If you do not specify a time, the default value of 60 seconds is used.

The format is:

**MTIM [seconds]**

where:

**seconds** specifies how long to leave the message window on your display. A value of 0 specifies no time out. The window will remain until the ESC key is pressed. A value of 1 to 3600 seconds (1 hour) is allowed. If there are multiple MTIM entries in the configuration file, the last entry will be the one used by your system.

For example, if you want the message window to remain on your display for 30 seconds, the configuration file entry is:

**MTIM 30**

With MTIM set to 30 seconds and messages displayed automatically (Immediate mode), the message will be displayed for 30 seconds. If the Esc key is not pressed in 30 seconds, the original display will appear. The message appears again when you press any key.

# OFFP

This is the System/36 sign-off procedure name. The personal computer router program automatically tries to sign off the System/36 when the STOPRTR program is run (unless you signed on before running the router program). In order to sign off, it uses the System/36 procedure OFF. If you need to change the method of signing off the System/36, you should use this entry.

For example, if you are running from a mandatory menu or if you want to force the router to sign you off when it is stopped, even if you were signed on previously, you can use OFFP.

The format of the OFFP entry is:

**OFFP x**

where:

**x** is a procedure name or option number.

You can have more than one OFFP entry in the CONFIG.S36 file or alternate configuration file to create a sequence of commands or procedures. The PC Support/36 router processes each entry by automatically entering the characters for that entry on the System/36 command display. The total number of characters in the OFFP entries, including enter keys appended by the router, cannot be greater than 256.

For example, assume your System/36 is set up so that after the System/36 router program ends, you are returned to your own menu. From your own menu, option 12 returns you to a main menu, and option 24 on the main menu signs you off the System/36. You could use the OFFP entries to perform these options as follows:

**OFFP 12**

**OFFP 24**

The characters specified for each entry are converted to uppercase characters. They are then checked to make sure they are valid System/36 commands or procedures. If they are not valid, you will receive an error message.

# PCSI

This entry allows you to specify the value of the PC Support/36 interrupt vector for the PC Support/36 message facility and transfer facility. You can change the value if the default, hexadecimal 69, is being used by another program on your personal computer.

If PC Support/36 message facility or PC Support/36 transfer facility has been started, the PCSI parameter can only be changed by restarting the personal computer. If a PCSI parameter is found in another configuration file prior to the restart, it will be ignored.

The format is:

**PCSI x**

where:

**x** is a value between hexadecimal 60 and hexadecimal 7F. If the number is invalid, an error message will be displayed.

*Note: If you want to change the interrupt value, it is recommended that you do not change it to a value between hexadecimal 70 and hexadecimal 7F if you are using an IBM 5170 Personal Computer AT, because the values hexadecimal 70 through hexadecimal 7F are used by the computer.*

For example, if you wish to change the interrupt value to hexadecimal 64, the entry in the configuration file is:

**PCSI 64**



# RTYP

This entry is used to select the router you want to use to communicate with the local System/36.

The format is:

**RTYP xxxx**

where:

**xxxx** is 5250 if you are using one of the 5250 emulation programs. If you are using the IBM Token-Ring Network router, the parameter is ITRN.

If no RTYP entry is found in the configuration file, the default RTYP 5250 is used.

If you are using the IBM Token-Ring Network router, this is a mandatory entry in the configuration file.

For example, if you are using the IBM Token-Ring Network router, the entry in the configuration file is:

**RTYP ITRN**

If multiple RTYP entries are found in the configuration file, the last entry is the one that will be used.

# TRAL

This entry allows you to reserve links to be used by other applications that will be using the IBM Token-Ring Network adapter. You should specify this entry only if you plan to have other applications use the IBM Token-Ring Network adapter.

The format is:

**TRAL x**

where:

**x** is the number of additional links you wish to reserve. The default is zero. The sum of TRRL and TRAL cannot exceed 32. This is an optional entry and is ignored if the adapter has already been opened.

For example, if you want to reserve four extra links for other applications, you would type:

**TRAL 4**

If multiple TRAL entries are in the configuration file, the last entry will be used.

# TRAN

If more than one IBM Token-Ring Network adapter card is installed or if the IBM Token-Ring Network adapter card is installed as the secondary adapter in your personal computer, this entry allows you to specify which adapter is to be used by this session.

The format is:

**TRAN x**

where:

x is 0 for the primary adapter.

x is 1 for the secondary adapter.

If this entry is not in the configuration file, the system will default to 0 (the primary adapter).

For example, if you have two IBM Token-Ring Network adapters in your personal computer and you wish to use the adapter card defined as the secondary adapter, the entry in the configuration file is:

**TRAN 1**

The IBM Token-Ring Network router can only use one adapter at a time. If you have two IBM Token-Ring Network adapter cards in your personal computer, and you want to switch from one card to the other, you must first stop the router with the **STOPRTR** command. Then restart the router with the **STARTRTR** command using an alternate configuration file. The configuration file must contain a **TRAN** entry with the appropriate adapter number.

If multiple **TRAN** entries are in the configuration file, the last entry will be used.

# TRAS

This entry allows you to specify how many additional service access points (SAPs) stations will be reserved, in addition to those needed by the router, when the IBM Token-Ring adapter is initialized and opened.

The format is:

**TRAS x**

where:

**x** is the number of additional service access points to reserve. The maximum number is 9 and the default is 0.

You should specify this entry only if you plan to have other applications using the IBM Token-Ring Network adapter.

This is an optional entry and is ignored if the adapter has already been opened.

If multiple TRAS entries are in the configuration file, the last entry will be used.

# TRDL

This entry allows you to specify the default link the router is to use if the application does not specify a link name.

The format is:

## **TRDL link name**

where:

**link name** must match the name of an active link name from a previously processed TRLI entry.

The link name must meet the same naming criteria as remote system name on the EMLI entry.

This entry is processed every time STARTRTR is run.

If this entry is not specified, the first link that is started becomes the default link.

If multiple TRDL entries are in the configuration file, the last entry will be used.

# TRLI

This entry must be in the router configuration file when you are using the IBM Token-Ring Network Router. This entry is used to start and stop links.

To start remote links the format is:

**TRLI link name, remote-adapter-address,  
[destination SAP],  
[user ID],  
[remote system name]**

where:

**link name** is required. There is no default. This is a unique name that you create to identify the link between your personal computer router and the System/36 router. Your personal computer can have a link connection with up to six System/36s. The link name should be meaningful so that it is possible to identify the System/36 where the link is attached. This is the same link name that is used on the TRDL parameter.

The link name must meet the same naming criteria as remote system name on the EMLI entry.

**remote-adapter-address** is required. There is no default. The System/36 operator has to supply you with this address. This is the address of the System/36 IBM Token-Ring Network adapter. This address is 12 hexadecimal characters.

**destination SAP** should only be specified if the System/36 operator has changed the default value. This is an optional parameter. This parameter is the service access point (SAP) value that matches the System/36 router SSAP value. This value, if specified, must be a non-zero hexadecimal number divisible by four and in the range of hexadecimal 04 to hexadecimal FC.

**user ID** is the user-ID you enter when you sign on the System/36. This parameter is optional. If you do not specify this parameter, the router will prompt you for the data.

**remote system name** is the default remote system name the router will use if the application does not specify a name. The name specifies the actual location of the system that is to run the application. This parameter allows applications to use resources on a different system than the system running the System/36 router. This parameter is optional. If this parameter is not specified, applications not providing a name will be connected to the same system as the System/36 router.

The remote system name must meet the same naming criteria as remote system name on the EMLI entry.

Multiple TRLI entries can be specified. The entries will be processed in the order of appearance. An error will be displayed if the number of links started exceeds the number of links specified in the TRRL entry. This makes it possible for the user to log on to more than one system using the STARTRTR command. You will be prompted for a password since a password cannot be included as a parameter.

For more information on how to attach to multiple systems, refer to Chapter 3, "The PC Support/36 Routers."

When you specify the TRLI entry to start a link and you do not specify one parameter but you wish to specify a following parameter, you must type the comma for the parameter you did not specify.

For example, if you wanted to specify a link name, remote adapter address, and remote system name, you would type:

**TRLI S400,111111111111,, S700**

Any parameters not specified are set to the default value.

To stop remote links the format is:

**TRLI link name**

where:

**link name** must match a currently active link.



# TRLN

This entry provides the personal computer portion of the IBM Token-Ring Network router with a unique 8-character name. The router supplies the name to the System/36 when it makes contact. The name uniquely identifies this personal computer in the System/36 ICF environment. The name is used by the System/36 as the ICF location name. The name must be unique among all personal computers communicating to a specific System/36 and unique among all personal computers on the IBM Token-Ring Network.

*Note: It is recommended that this name be different than your user-ID.*

The format is:

**TRLN xxxxxxxx**

where:

**xxxxxxx** is the IBM Token-Ring Network router location name. This entry is required; there is no default. The name must be unique for all ICF locations communicating to the System/36.

The router location name must meet the same naming criteria as remote system name on the EMLI entry.

There are various methods you can use to ensure that your location names are unique. If you have a small network, it may be sufficient to use a form of the user's names. For example,

Joe  
Mary  
Bill

If you have a large network, using names may not be sufficient to ensure unique names. You may want to use the following method. When your IBM Token-Ring Network cabling was installed, cable outlets were placed throughout the building. Each of these outlets should have a unique number that identifies that outlet. You could use this number to identify the IBM Token-Ring router location name. This will ensure the uniqueness of the names.

# TRRL

This entry allows you to specify the maximum number of System/36s you will communicate with at the same time.

The format is:

**TRRL x**

where:

**x** is the number of systems you will communicate with at the same time. The maximum number allowed is six. If the entry is not found, the router default is three.

Do not specify more than the number you need. Each additional link takes up personal computer and IBM Token-Ring Network adapter resources.

This is an optional entry and is ignored if the IBM Token-Ring Network adapter has already been opened.

# TRSS

This entry allows you to specify the service access point (SAP) value used by the IBM Token-Ring Network router on the personal computer.

The format is:

**TRSS xx**

where:

**xx** is a value divisible by four in the range between hexadecimal 04 and hexadecimal EC.

This is an optional entry and should only be used if the default value hexadecimal 0C is being used by another function using the IBM Token-Ring Network adapter. The SAP value must be different for each function using the IBM Token-Ring Network adapter.

If multiple TRAL entries are in the configuration file, the last entry will be used.

# VDSK

You can use this entry to assign or release virtual disks when the CFGVDSK program is run. VDSK entries are processed when the CFGVDSK.COM program runs. Because you can assign as many as eight virtual disks, you can have a number of VDSK entries in the CONFIG.S36 file or a VDSK setup file. However, you can assign only one virtual disk to each drive. Refer to Chapter 5, "Using the PC Support/36 Virtual Disk Facility," in the *PC Support/36 User's Guide* for details.

When you specify the VDSK entry, you must use the following format:

**VDSK d [,vdkname[,a]]**

where:

**d** is the virtual disk drive to be assigned or released.

**vdkname** is the name of the virtual disk to assign. This parameter is optional. If specified, the virtual disk name must be separated from the virtual drive letter by a comma. If you do not specify a virtual disk name, the system releases the virtual disk assigned to the drive you entered for **d**.

**a** is the access level for the virtual disk you named in the `vdkname` parameter. The access level must be a number from 1 to 3.

where:

- 1 (Exclusive): means that no other users can access the virtual disk as long as you have it assigned. You will be able to assign the disk at this level only if no one else is using it. No other users can assign this disk until you release it.

*Note: If the virtual disk is protected by System/36 resource security, the minimum required access level is update authority.*

- 2 (Read/Write): means that you can read and write to the virtual disk, and other users can assign and read the disk. If another user has the virtual disk assigned with an access level of exclusive or read/write, you will not be able to assign the disk using an exclusive or read/write access level.

This level of access should be used with caution. If one user has read/write access, changes can be made to the virtual disk that may not be seen by the users with read only access if they are accessing the disk at the same time.

*Note: If the virtual disk is protected by System/36 resource security, the minimum required access level is update authority.*

- **3 (Read):** means you can read the virtual disk, but not write to it. Other users can read and write to the virtual disk. You would use this access level only if you want to be able to read information on a disk, but not change the information, especially by accident. If another user has the virtual disk assigned with an access level of exclusive, you will not be able to assign the disk using a read access level.

*Note: If the virtual disk is protected by System/36 resource security, the minimum required access level is read authority.*

If you do not enter a number for the access level, 1 (Exclusive) is used.

If you specify the parameters for the VDSK entry, you cannot leave blanks between the parameters.

You can have VDSK entries to cancel previous VDSK entries. For example, when the CFGVDSK program is run, the following entries assign disks to drives G, H, and J, and then release the virtual disk just assigned to H:

```
VDSK G,FREMAN2,3
VDSK H,N36K
VDSK J,NEWWORK,3
VDSK H
```

As these entries are processed:

- FREMAN2 is assigned to drive G with an access level of Read.
- N36K is assigned to drive H with the default access level (Exclusive).
- NEWWORK is assigned to drive J with an access level of Read.
- N36K is released from drive H.



# VPRT

This entry allows you to specify virtual printer assignments by running the CFGVPRT program. VPRT entries are processed when the CFGVPRT.COM program is run. You can specify as many VPRT entries as you want in the CONFIG.S36 file and VPRT setup file. When you specify the VPRT entry, you must use the following format:

**VPRT** **p**[,**p36**][,**cpl**][,**lpi**][,**pgl**][,**lpp**][,**nc**][,**t**][,**df**][,**ux**][,**co**][,**pdt**][,**cs**]

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where:

**p** is the number of the virtual printer. You can specify 1 (LPT1), 2 (LPT2), or 3 (LPT3). This parameter is required.

**p36** is the System/36 printer to which output will be sent. You can specify the 2-character printer name (for example, P1). This parameter is optional; if you do not specify a printer name, the printer specified in the previous parameter (**p**) is released.

**cpl** is the number of characters per line. You can specify 80, 132, or 198. This parameter is optional; if you do not specify this parameter, 80 is assumed. If a 3262, 4245, 5262, 5256, 5553 or 5557 Printer is being used, 198 characters per line cannot be specified.

**lpi** is the number of lines per inch. You can specify 6 or 8. This parameter is optional; if you do not specify this parameter, 6 is assumed.

**pgl** is the page length. You can specify any value from 1 through 127. This parameter is optional; if you do not specify this parameter, 66 is assumed. To calculate the page length, multiply the page length, in inches, by the number of lines per inch.

*Note: An error message will be sent to the system console if the page length specified is a value greater than the size of the paper in the printer.*

**lpp** is the number of lines to be printed per page. You can specify any value from 1 through the page length of the forms you are using. This parameter is optional; if you do not specify this parameter, 66 is assumed.

**nc** is the number of copies. You can specify a value from 1 through 255. This parameter is optional; if you do not specify this parameter, 1 is assumed.

**t** is the time-out value. You can specify a value from 1 to 255 seconds, or 0 (zero). Zero means that there is to be no time-out value (it is disabled). This parameter is optional; if you do not specify this parameter, 10 seconds is assumed.

**df** is the defer status. You can specify a 1 (Yes) or a 2 (No). This parameter is optional; if you do not specify this parameter, 1 (Yes) is assumed.

**ux** is the character to be printed when an untranslatable character is found. You can specify a 2-digit EBCDIC hexadecimal value. This parameter is optional; if you do not specify this parameter, hexadecimal 40 (EBCDIC blank) is used.

**co** specifies whether or not you want the commands in the printer data stream to override values previously specified for the printer. You can specify a 1 (Yes) or a 2 (No). This parameter is optional; if you do not specify this parameter, 2 (No) is assumed.

**pdt** specifies which printer data type should be used. You can specify 1 (S/36 printer data), 2 (Convert personal computer data to System/36), 3 (Final form text), or 4 (personal computer printer data). This parameter is optional; if you do not specify this parameter, 2 (Convert personal computer data to System/36) is assumed. For more information on printer data type, refer to the *IBM PC Support/36 User's Guide*.

**cs** specifies whether PC printer character set 1 or 2 should be used. You can specify 1 (character set 1) or 2 (character set 2). This parameter is optional; if you do not specify this parameter, 1 (character set 1) is assumed.

For more information about these parameters, refer to Chapter 7, "Using The PC Support/36 Virtual Printer Facility," in the *PC Support/36 User's Guide*.

If you do not specify one parameter, but you want to specify a following parameter, you must type the comma for the parameter you do not enter. For example, if you wanted to change only the page length to 68 and the number of copies to 13 for printer LPT2, you would enter:

**VPRT 2,P1,,68,,13**

Any parameters you do not specify are set to the default values, regardless of how these parameters were set prior to running the program CFGVPRT.COM.

# Processing the CONFIG.S36 File

The PC Support/36 programs search for the CONFIG.S36 file in the default drive and current directory. If the CONFIG.S36 file is found, the header record is checked (it must contain SUPPORT/36).

The CONFIG.S36 file is then searched for entries, one record at a time. If the program finds records to be used, it uses them as overrides or function requests. Any errors in the parameters result in error or warning messages.

Different PC Support/36 programs search for different entries in the CONFIG.S36 file. For example, the CFGVDSK program uses the A2ET and E2AT entries, but does not search for EMSN or HPRC entries (these are used only by the router).

Entries that appear more than once in the file will be overridden by the entry that appears last in the file. (The only exceptions to this are the HPRC, OFFP, TRLI, VDSK, and VPRT entries. Refer to “HPRC,” “OFFP,” “TRLI,” “VDSK,” and “VPRT” earlier in this chapter.)

The CONFIG.S36 file is not processed if one of the following occur:

- CONFIG.S36 is not found when the default drive and directory are searched. In this case, PC Support/36 proceeds as if the file was not created.
- The header record in CONFIG.S36 is not correct (not SUPPORT/36). In this case, an error message is displayed, allowing you to choose whether you want to continue without the CONFIG.S36 records, or exit from the program.
- There are no valid entries in CONFIG.S36. In this case, the program proceeds as though the file had not been found.
- An alternate configuration file was specified on the STARTRTR command or the STARTMSG command.

When you specify the default drive and directory, you can use more than one CONFIG.S36 file. This allows you to operate in several different modes by changing the default drive and directory when you have a different CONFIG.S36 file on each drive and directory.

Some PC Support/36 programs allow a particular default to be overridden as a parameter when the program is run. In the same way, these programs can override entries in the CONFIG.S36 file. The parameters used when the program is run usually override those specified in the CONFIG.S36 file.

The virtual printer program (VPRT.COM) reads the CONFIG.S36 file the first time it is run. Once this program is installed and running, changing a value in the CONFIG.S36 file will have no effect on this program. The personal computer must be restarted before the changes take effect.

If a STARTMSG command is run, the message facility will process any of its entries that have been changed in the CONFIG.S36 file.

## Example

The following shows an example of a CONFIG.S36 file:

```
SUPPORT/36  
DSPL M  
VDSK F,MYDISK,2  
VDSK G,PCGAMES,3  
VDSK I
```

The DSPL entry indicates that you are using a monochrome display attached to a color adapter. The DSPL entry causes the interactive PC Support/36 programs (SETPRT, SETVDSK, TOPC, FROMPC, TRTABLE, MSG and STARTMSG) to use the appropriate display attributes.

When the CFGVDSK program processes the entries in the CONFIG.S36 file, it does the following:

- Assigns the virtual disk named MYDISK to the virtual drive letter F with an access level of 2, Read/Write
- Assigns the virtual disk named PCGAMES to the virtual drive letter H with an access level of 3, Read
- Releases the virtual disk assigned to the virtual drive letter I

CFGVDSK uses the CONFIG.S36 file VDSK entries if a VDSK setup file name is not specified on the CFGVDSK command. If the VDSK setup file name is specified, CFGVDSK ignores the VDSK entries in the CONFIG.S36 file and uses those specified in the VDSK setup file.

Also, CFGVPRT uses the CONFIG.S36 file VPRT entries if a VPRT setup file name is not specified on the CFGVPRT command. If the VPRT setup file name is specified, CFGVPRT ignores the VPRT entries in the CONFIG.S36 file and uses those specified in the VPRT setup file.

# Chapter 3. The PC Support/36 Routers

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# Overview

The PC Support/36 router controls communication between one or more PC Support/36 applications and their counterpart applications on the System/36. The link to the System/36 can be through a 5250 Emulation Program or the IBM Token-Ring Network session.

When the router uses a 5250 Emulation Program, it will be referred to as the 5250 router. When the router uses the IBM Token-Ring Network, it will be referred to as the IBM Token-Ring router.

You have your choice of running either the 5250 router or the IBM Token-Ring router. You cannot run both versions of the router simultaneously, nor can you switch between the 5250 router and the IBM Token-Ring router without restarting your personal computer.

# Router Programs

The PC Support/36 routers consist of the following programs:

- **STARTRTR.EXE** is the program that must be run to start communications with the System/36. **STARTRTR.EXE**, in turn, loads one of the following programs:

**5250RTR.EXE** if you are running in the 5250 Emulation environment. This program can only be loaded by **STARTRTR.EXE** and should not be executed from the DOS prompt.

**ITRNRTR.EXE** if you are running in the IBM Token-Ring Network environment. This program can only be loaded by **STARTRTR.EXE** and should not be loaded from the DOS prompt.

*Note: **STARTRTR.EXE**, **5250RTR.EXE**, and **ITRNRTR.EXE** must be located in the current drive and directory when starting the router.*

- **STOPRTR.EXE** is the program that must be run to stop communications with the System/36.

# **Batch Level Codes Set by STARTRTR**

If you are running a batch file, STARTRTR sets a return code that can be checked by the DOS batch file command `IF ERRORLEVEL`. If the router is started successfully, the error level is 0 (zero). If an error occurs but the router is able to continue, the error level is 10. If an error occurs and the router is not able to make contact with the System/36, the error level is 20.

# 5250 Router

## Prerequisites

The router must be running before you can use any of the other PC Support/36 programs, except the translation table utility.

Before you can start the router, you must load DOS and the emulation program. The emulation program should be loaded as soon as you power on or restart your personal computer, or should be placed in an AUTOEXEC.BAT file so that it is loaded automatically.

# Starting the 5250 Router

There are two formats for the **STARTRTR** command:

**STARTRTR [configuration file]**

which starts the router, and

**STARTRTR /D**

which displays the router status.

The formats for the **STARTRTR** command cannot be combined. You either have to enter **STARTRTR** configuration file or **STARTRTR /D**.

If the **/** is not found on the command line, **STARTRTR** assumes that any nonblank character after **STARTRTR** is the name of a configuration file.

## Starting the Router

To start the personal computer router program, do the following:

1. Make sure that your personal computer is properly connected to the System/36. If you need help, contact your System/36 system operator.
2. After the DOS prompt, type:

**STARTRTR [configuration file]**

and press the Enter key.

**configuration file** is an optional parameter that specifies the name of an alternate configuration file you created to be used in place of CONFIG.S36.

If no configuration file entry is specified, the default CONFIG.S36 will be used.

If you did not sign on System/36 when you loaded the emulation program, the System/36 Sign On display appears as follows:

```

                                SIGN ON                                Xi
                                Optional-*

User ID . . . . . █-----
Password . . . . . -----
User menu . . . . . ----- *
Library . . . . . ----- *
Procedure . . . . . ----- *

Help-Assistance for sign on                                COPYRIGHT 1985 IBM Corporation
```

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3. Sign on System/36 by typing your user identification and password (if any).

*Note: If your personal computer is a system console for a System/36 5364 System Unit, you must sign on System/36 before running STARTRTR or an error message will be displayed.*



When the STARTRTR program is loaded, it checks to make sure that an active router does not exist. If it finds a router active, STARTRTR reprocesses some configuration file entries, and the router remains active.

If it does not find a router already active, it searches the current directory for the alternate configuration file you specified on the STARTRTR command. If the alternate configuration file parameter is blank, it searches for the PC Support/36 configuration file, CONFIG.S36. If the configuration file exists, the router searches for any of the following entries:

- RTYP (router type)
- INTL (interrupt number)
- EMSN (emulator session number)
- HPRC (host router procedure name)
- OFFP (sign-off procedure name)
- EMLI (remote system name)
- A2ET (change default ASCII to EBCDIC translation table)

*Note: When the router is already active and the STARTRTR command is executed, the EMLI configuration file entries are the only entries processed.*

The values specified for these entries override the default parameter values for the router. For details on how to specify these entries, refer to Chapter 2, "The PC Support/36 Configuration File."

The personal computer router verifies that an emulation program has been loaded and then starts the System/36 router program by automatically running the IWR OUTER procedure. If an error occurs and the System/36 router program cannot be started, an error message is displayed.

When the System/36 router program is started, the personal computer router program ends and becomes a resident part of DOS.

The personal computer router and the System/36 router communicate with each other by sending and receiving information on the display (in 5250 emulation mode). This display then becomes unusable for other System/36 applications. However, if you wish to run a System/36 command or application, you can interrupt the router. For information on how to do this, refer to "Interrupting the 5250 Router" in the next section.

## **Display Router Status**

Router status is displayed by entering the following:

**STARTRTR /D**

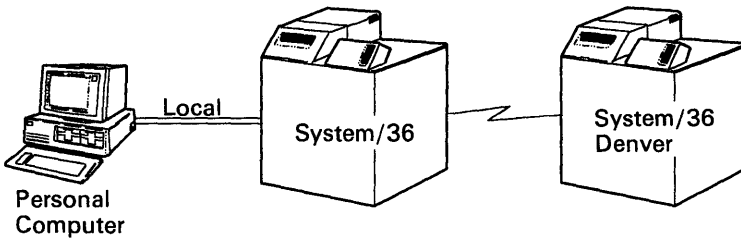
Router status is displayed when a remote system name has been activated through the use of an EMLI configuration file entry. This does not mean that the remote system is currently active. Refer to Chapter 2, "The PC Support/36 Configuration File," for information on the EMLI configuration entry.

The status appears on the following display:

```
C> STARTRTR /D  
  
PC Support/36  
5250 Emulation Router  
Version 04.00 (c) IBM Corp. 1987  
  
DENVER is the remote system  
  
C>
```

S9097916-2

For example, assume that the personal computer and your System/36 are connected like the following example:



S9097505-0

The router uses your configuration file to establish a link between your personal computer and the remote System/36 called DENVER. Your configuration file would have the following entries:

- Support/36
- EMLI DENVER

After the configuration file has been successfully processed, you can display the router status by entering the following:

**STARTRTR /D**

The router status would be displayed as follows:

```
C> STARTRTR /D  
  
PC Support/36  
5250 Emulation Router  
Version 04.00 (c) IBM Corp. 1987  
  
DENVER is the remote system  
  
C>
```

S9097916-2

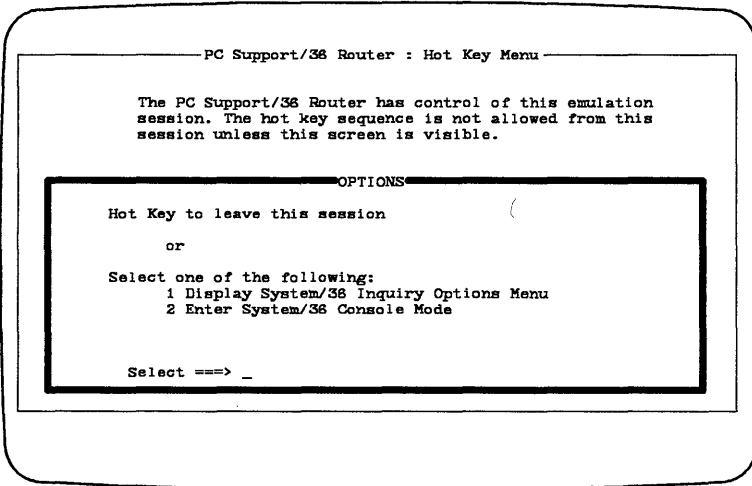
# Stopping the Router

Once the router is started, it controls the 5250 emulation session. This means that you must stop the router if you want to use your personal computer as a 5250 display station. To do this, you can either end or temporarily interrupt the router.

# Interrupting the 5250 Router

To temporarily interrupt the 5250 router, do the following:

1. Make sure the router is not currently sending data to or receiving data from any of the PC Support/36 programs.
2. Use the hot key sequence to enter 5250 emulation mode. The PC Support/36 Router: Hot Key menu will be displayed as follows:



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*Note: The number of options available on the PC Support/36 Router: Hot Key menu depends on your system configuration.*

3. Select option 1 by typing 1 on the hot key menu. This causes the System/36 Inquiry Options menu to appear, as follows:

```
INQUIRY OPTIONS                               Interrupted Job: W1131042                               W1

0. Resume interrupted job
1. Request Command display
2. Cancel job and close files; new data is saved
3. Cancel job; new files are lost
4. Set inquiry condition for program
5. Display session status
6. Display messages sent to this display station

Enter number to select option
■
```

S9097302-0



4. Select option 1 by typing 1 on the Inquiry menu. This causes the System/36 command display to appear, as follows:

```

                                MAIN          INQUIRY          X1
                                Main System/36 help menu

Select one of the following:

1. Display a user menu
2. Perform general system activities
3. Use and control printers, diskettes, or tape
4. Work with files, libraries, or folders
5. Use programming languages and utilities
6. Communicate with another system or user
7. Define the system and its users
8. Use problem determination and service
9. Use office products
10. Sign off the system

Cmd3-Previous menu  Cmd7-End  Cmd12-How to use help  Home-Sign on menu
Ready for option number or command          Cmd1-Resume job

                                (c) 1985 IBM Corp.
```

S9097303-1

You can now use your personal computer as a 5250 display station. Because the System/36 router is not currently active, you will not be allowed to hot key from this emulation session. You must return to the PC Support/36 Router: Hot Key menu (resume operation of the System/36 router) before you will be allowed to hot key back to personal computer mode.

When you want to return to personal computer mode, do the following:

1. Press the emulated Cmd1. When the System/36 router resumes operation, the PC Support/36 Router: Hot Key Menu will be displayed.
2. Use the hot key sequence to return to personal computer mode. You can now continue with your PC Support/36 program.

If you find it impossible to resume the System/36 router's operation and return to the PC Support/36 Router: Hot Key Menu, follow these steps to return to personal computer mode:

1. Use the hot key sequence to display the following window:

```

                                MAIN          INQUIRY          X1
                                Main System/36 help menu

Select one of the following:

1. Display a user menu
2. Perform general system activities
3. Use and control printers, diskettes, or tape
4. Work with files, libraries, or folders
5. ERROR
6.
7. Hot key at this time may abnormally terminate the router.
8. Hot key is recommended only from the PC Support/36 Hot Key
9. Menu. Press any key to continue, or press Enter to allow
10. hot key at this time.

Cmd3-Previous menu  Cmd7-End  Cmd12-How to use help  Home-Sign on menu
Ready for option number or command          Cmd1-Resume job

                                (c) 1985 IBM Corp.
```

S9097907-0

2. Press the Enter key to remove the window.
3. Use the hot key sequence again to return to personal computer mode. PC Support/36 programs will no longer be able to use the router to communicate with the System/36.
4. You must run the STOPRTR program to completely terminate the router.

# Ending the 5250 Router

If you have finished using the PC Support/36 programs, you can end the router. To end the router, do the following:

1. Make sure that all other personal computer applications communicating with the System/36 router program have ended. (All sessions currently active must be ended. For more information on how to end these sessions, refer to Chapter 12, "Ending PC Support/36," in the *PC Support/36 User's Guide*.)
2. Type the following command after the DOS prompt:

**STOPRTR [/F]**

where:

**/F** means force stop. This is an optional parameter. The router verifies that all personal computer applications using the router have ended (for example, all virtual disks and virtual printers have been released). If the **/F** option is specified and there are applications using the router, the personal computer router program ends the System/36 router program.

If the **/F** parameter is not specified and the personal computer applications using the router have not ended, an error message is displayed, giving you an option to end the System/36 router program anyway by pressing the Enter key or to cancel the STOPRTR command by pressing the ESC key.

If you are running a batch file, STOPRTR sets a return code that can be checked by the DOS batch file command IF ERRORLEVEL. If STOPRTR completes successfully, the error level is 0 (zero). If an error occurs but you choose to continue, the error level is set to 10 (hexadecimal 0A). If an unrecoverable error occurs or you choose to abort STOPRTR, the error level is set to 20 (hexadecimal 14).

*Note: If you have virtual printers assigned when you enter STOPRTR, it is not recommended that you force the router to stop. It is possible that data remains in the buffers and this data is not yet sent to the System/36 printer.*

*To ensure that all of the data is sent to the printer and the printer file is closed, you must use the SETVPRT command to release the virtual printers, then enter the STOPRTR command again.*

3. When the System/36 router program ends, one of the following happens:
  - If you were not signed on the System/36 as a 5250 Work Station when the router was started, you are automatically signed off the System/36.
  - If you signed on the System/36 as a 5250 Work Station when the router was started, you remain signed on unless you had one or more OFFP entries in your configuration file. In this case, the OFFP entries are processed. For more information on the OFFP entry, refer to Chapter 2, "The PC Support/36 Configuration File."

The router remains a resident part of DOS. If you want to restart it, type the STARTRTR command.

# IBM Token-Ring Network Router

## Prerequisites

The communications between your personal computer and your System/36 is the IBM Token-Ring Network. The IBM Token-Ring Network must be installed and functioning before the IBM Token-Ring Network router may be used.

The router must be running before you can use any of the other PC Support/36 utilities, except the translation table utility.

As with the other PC Support/36 utilities, the router is composed of two parts. There is a piece of the router that executes on the System/36 and there is a piece that executes on the personal computer. The System/36 router must be started first, then the personal computer router may be started.

## Starting the IBM Token-Ring Network Router

Before you can start the personal computer portion of the IBM Token-Ring router:

- The IBM Token-Ring Network must be installed and functioning.
- The System/36 portion of the router must be ready, ENABLED.

- You must load DOS on the personal computer. The IBM Token-Ring router requires DOS 3.2 or a later compatible version of DOS in order to function correctly. See the appropriate DOS manuals to determine how to load DOS.
- You must load the IBM Token-Ring Network PC Adapter Support Interface, TOKREUI.COM, on the personal computer. Refer to the *IBM Token-Ring Network PC Adapter Guide to Operations* manual for instructions on how to load TOKREUI.COM.

Whenever the IBM Token-Ring router communicates with the IBM Token-Ring Network, requests are made to the PC Adapter Support Interface which then talks to the IBM Token-Ring Network. Therefore, the PC Adapter Support Interface must be installed before the IBM Token-Ring router will function.

There are two formats for the STARTRTR command:

**STARTRTR [configuration file]**

which starts the router, and

**STARTRTR /D**

which displays the router status.

The formats for the STARTRTR command cannot be combined. You either have to enter STARTRTR configuration file or STARTRTR /D.

If the / is not found on the command line, STARTRTR assumes that any nonblank characters after STARTRTR is the name of a configuration file.

# Starting the Router

After the DOS prompt, type:

**STARTRTR [configuration file]**

and press the Enter key.

**configuration file** is the name of an alternate configuration file you created to be used in place of CONFIG.S36. This is an optional entry. If no configuration file is specified, the CONFIG.S36 file is used.

When the STARTRTR program is loaded, it checks to make sure that an active router does not exist. If it finds a router active, STARTRTR reprocesses some configuration file entries and the router remains active.

If it does not find a router already active, it searches the current directory for the alternate configuration file you specified on the STARTRTR command. If the alternate configuration file parameter is blank, it searches for the PC Support/36 configuration file, CONFIG.S36. If the configuration file exists, the router searches for any of the following entries:

## Required

- RTYP ITRN
- TRLN (IBM Token-Ring router location name)

## Optional

- INTL (Interrupt number)
- TRAN (IBM Token-Ring adapter number)
- TRSS (Source SAP value)
- TRRL (Maximum number of router links)
- TRAL (Number of additional links)
- TRAS (Number of additional SAPs)
- TRLI (IBM Token-Ring link information)

- TRDL (IBM Token-Ring default link)
- A2ET (Change default ASCII to EBCDIC translation table)

*Note: If no TRLI entries are in the router configuration file, the router will still install and remain resident in personal computer storage; however, the router will be unusable since it is not communicating with any of the System/36 systems.*

The values specified for the optional entries override the default values for the router. For details on how to specify these entries, refer to Chapter 2, "The PC Support/36 Configuration File."

Since the IBM Token-Ring router requires some of the configuration file entries, the configuration file must be set up before the STARTRTR command may be used to start the IBM Token-Ring router.

If the router is already active and the STARTRTR command is reissued, the only configuration file entries that take effect are the TRDL and TRLI entries.

The following example shows what the CONFIG.S36 file might look like if you chose to place the bare minimum number of entries in the configuration file and still allow the IBM Token-Ring router to communicate with the System/36.

```
SUPPORT/36
RTYP ITRN
TRLN PC1
TRLI 5360,1005F0001986
```



# Special Considerations for the IBM Token-Ring Network Router

## IBM Token-Ring Network PC Adapter Configuration

When the IBM Token-Ring router is started, it opens the IBM Token-Ring Network PC adapter by issuing commands to the IBM Token-Ring PC Adapter Support Interface which communicates directly with the adapter. The IBM Token-Ring router uses entries in the configuration file to determine how the adapter should be set up. The following list shows the configuration file entries that are used to set up the adapter :

- TRRL (maximum number of remote links)
- TRAL (number of additional links)
- TRAS (number of additional SAPs)

To remain compatible with other programs that may want to use the IBM Token-Ring Network, if the adapter has already been opened, the IBM Token-Ring router will attempt to use the adapter in its present condition. It will not reopen the adapter. This means that the TRRL, TRAL, and the TRAS configuration file entries will not take effect.

If you want the TRRL, TRAL, and TRAS entries to be used by the IBM Token-Ring router and the adapter is already open, you will have to turn off the power to your personal computer. Then turn the power on to restart the IBM Token-Ring router.

*Note: When the router is stopped by the STOPRTR command, the adapter remains in an open state and therefore the TRRL, TRAL, and the TRAS configuration file entries will not take effect if the router is restarted.*

## Performance Considerations

Located on the IBM Token-Ring Network PC adapter is an adapter-shared RAM that is used for communication between the personal computer and the adapter. The adapter-shared RAM is also used for communication between the adapter and the IBM Token-Ring Network itself. The amount of adapter-shared RAM remains fixed. The IBM Token-Ring router supports the IBM Token-Ring Network PC adapter cards that have either 8K or 16K of adapter-shared RAM.

The adapter-shared RAM is divided into two areas. The first area is used to store pertinent IBM Token-Ring Network information. The second area is used to hold data that is transmitted to and received from the IBM Token-Ring Network. When the IBM Token-Ring Network PC adapter is set up (opened), the size of these areas are defined. By keeping the area that is used to store IBM Token-Ring Network information small, the area that is capable of transmitting and receiving data will be large and the net result will be the ability to transmit and receive more data. Therefore, you should experience an increase in performance by keeping the data transmit and receive area large and the IBM Token-Ring Network information area small.

There are three configuration file entries that affect the size of the adapter shared RAM area used for the Token-Ring Network information and they are the same entries that are used to set up the adapter when the adapter is opened. The entries are :

- TRRL (maximum number of router links)
- TRAL (number of additional links)
- TRAS (number of additional SAPs)

Each link (maximum number of router links plus the number of additional links) and each SAP (one SAP for the IBM Token-Ring router plus the number of additional SAPs) require adapter-shared RAM space. To obtain the best IBM Token-Ring router performance, you should keep these values as small as possible. The default values for the TRRL, TRAL, and TRAS configuration file entries should give you the maximum performance on the IBM Token-Ring router. As you increase the value of any of the above configuration file entries, it is possible that you will see a decrease in performance.

## **Adapter-Shared RAM Address**

When the IBM Token-Ring Network PC adapter is initialized, the personal computer memory that is used to define the adapter-shared RAM area may be specified in terms of a segment address. The IBM Token-Ring router uses the default value for this segment address. If this default area in PC memory is already being used, there is a parameter on the command to load the IBM Token-Ring Adapter Support Interface that allows you to change the default adapter-shared RAM segment address. For the current default values and the format of the Adapter Support Interface command, see the *IBM Token-Ring Network PC Adapter Guide to Operations*.

## **DOS Internal Stack Considerations**

There exists the possibility that DOS's available stack resources will become depleted. To avoid this problem, you may have to place a STACKS command in the CONFIG.SYS file. For more information, refer to the *IBM Token-Ring Network PC Adapter Guide to Operations* manual and the *IBM Personal Computer Disk Operating System Reference* manual.

# Display Router Status

Router status is displayed by entering the following command:

**STARTRTR /D**

Router status is displayed when the router has determined that there is an active link connection. If there is an active link connection, the status will be displayed on the following display:

```
C> STARTRTR /D
PC Support/36
IBM Token-Ring Network Router
Version 04.00 (c) IBM Corp. 1987

STATUS for IBM Token-Ring Network Router

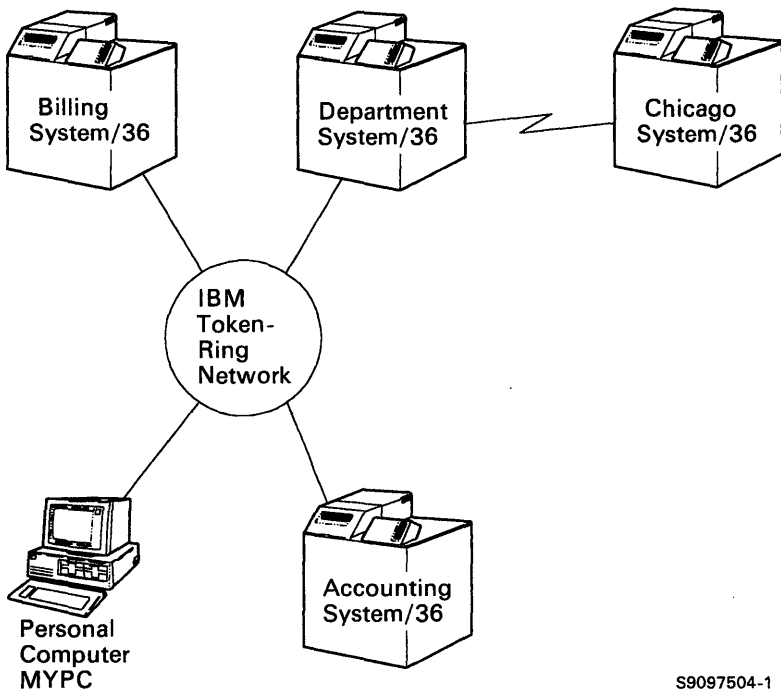
DEFAULT  SYSTEM/36 LINK NAME  REMOTE SYSTEM NAME
->         DEPT                 CHICAGO
.          ACCOUNTG             .
.          BILLING              .

C>
```

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The System/36 link name and the remote system name (if there is one), will be displayed. Also, a pointer to the default System/36 link will be displayed.

For example, assume that the personal computer and your System/36 are connected like the example on the next page.



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Your router uses the following configuration file to establish a link between your personal computer and the System/36s on the DEPT link, ACCOUNTG link, BILLING link, and the remote System/36 CHICAGO through the DEPT link. Your configuration file would have the following entries:

- Support/36
- RTYP ITRN
- TRLI DEPT,1000A7001234,,CHICAGO
- TRLI ACCOUNT,1000A7002001
- TRLI BILLING,1000A7003579
- TRLN MYPC
- TRRL 5

After the links have been successfully established, you would display the router status by entering the following:

## STARTRTR /D

The router status would be displayed as follows:

```
C> STARTRTR /D
PC Support/38
IBM Token-Ring Network Router
Version 04.00 (c) IBM Corp. 1987

STATUS for IBM Token-Ring Network Router

DEFAULT  SYSTEM/38 LINK NAME  REMOTE SYSTEM NAME
->          DEPT          CHICAGO
.          ACCOUNTG      .
.          BILLING       .
.          .              .
.          .              .

C>
```

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# Ending the IBM Token-Ring Network Router

If you have finished using the PC Support/36 programs, you can end the router. To end the router:

1. Make sure that all other personal computer applications communicating with the System/36 router program have ended. (All sessions currently active must be stopped. For more information on how to do these things, refer to Chapter 12, "Ending PC Support/36" in the *PC Support/36 User's Guide*.)
2. Type the following command after the DOS prompt:

**STOPRTR [/F]**

where:

**/F** means force stop. This is an optional parameter. The router verifies that all personal computer applications using the router have ended (for example, all virtual disks and virtual printers have been released). If the **/F** option is specified and there are applications using the router, the personal computer router program ends the System/36 application programs.

If the **/F** parameter is not specified and the personal computer applications using the router have not ended, an error message is displayed, giving you an option to end the System/36 application programs by pressing the Enter key or to cancel the STOPRTR command by pressing the ESC key.



If you are running a batch file, STOPRTR sets a return code that can be checked by the DOS batch file command IF ERRORLEVEL. If STOPRTR completes successfully, the error level is 0 (zero). If an error occurs but you choose to continue, the error level is set to 10 (hexadecimal 0A). If an unrecoverable error occurs or you choose to abort STOPRTR, the error level is set to 20 (hexadecimal 14).

*Notes:*

- 1. If you have virtual printers assigned when you enter STOPRTR, it is recommended that you do not force the router to stop. It is possible that data remains in the buffers, and this data is not yet sent to the System/36 printer. To ensure that all of the data is sent to the printer and the printer file is closed, you must use the SETVPRT command to release the virtual printers, then enter the STOPRTR command again.*
- 2. The IBM Token-Ring Network router may also be stopped abnormally from the System/36 using the DISABLE command. Refer to "Using System/36 Communications" for more information on how to do this command. This is not the recommended method to stop the routers because there may be data left in the buffers that has not been sent to the System/36.*

# Multiple Systems

One of the characteristics of an IBM Token-Ring Network is the ability to attach multiple devices to the network and have them communicate with each other. On a single IBM Token-Ring Network, you can have multiple personal computers and multiple System/36s. The PC Support/36 Token-Ring router can attach and communicate with up to six System/36s at one time.

Each link with a System/36 is made when the STARTRTR command is executed. The number of links and the specifics of each link are determined by the TRLI entries in the router configuration file. Each link to a System/36 requires a separate TRLI entry. Multiple TRLI entries may be contained in a configuration file, or you may run STARTRTR several times, each time specifying a different router configuration file with a different TRLI entry.

With this support, it is possible to do the following:

- Activate multiple links with up to six System/36s with the STARTRTR command.
- Activate an additional link with another System/36 with the STARTRTR command.
- Deactivate an active link to a System/36 using the STARTRTR command.
- Change the current default link with the STARTRTR command.

Information on how to do the above functions is contained in the following section.

# Starting Multiple Links

To start a link with more than one System/36, you simply place more than one TRLI entry in the CONFIG.S36 file (or alternate configuration file).

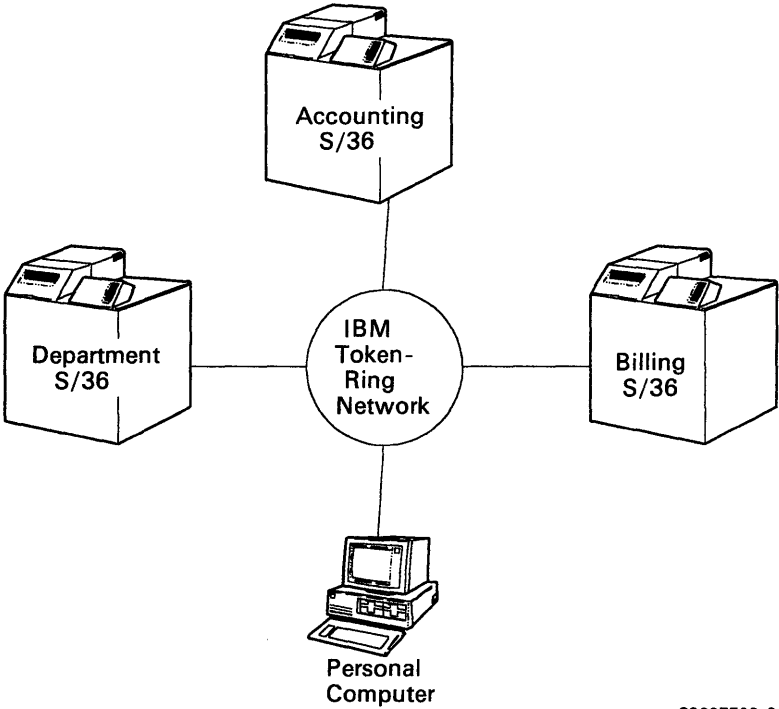
Each TRLI entry contains the name of the link you are starting and the adapter address of the remote system with which you wish to connect (among other things). Refer to Chapter 2, "The PC Support/36 Configuration File," for details on the TRLI parameters.

When the STARTRTR command is run, each TRLI entry is processed one at a time. If appropriate, you are prompted for user-ID and password for each system to which you are connecting. The success or failure of each link connection is displayed to you and, if successful, processing continues with the next TRLI entry in the configuration file.

For example, suppose you wished to start a link with three separate System/36s every time you started the IBM Token-Ring router. You must know the adapter addresses of each of these systems. (The IBM Token-Ring Network adapter address of a particular System/36 may be obtained from that system's system operator.)

For our example, let's assume that the three systems you are attaching to are the following:

- **System One:** This is your own department's system. It is the one you use most often and contains all of the virtual disks that you use from day to day. The adapter address of this system is 1000A7001234.
- **System Two:** This is the accounting department's system. Periodically throughout the day, you need to retrieve files from this system using the PC Support/36 transfer facility. The adapter address of this system is 1000A7002001.
- **System Three:** This is the billing department's system. Periodically throughout the day, you need to upload files to this system using the PC Support/36 transfer facility. The adapter address of this system is 1000A7003579.



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To attach to all three systems using one STARTRTR command, you could place the following entries in your CONFIG.S36 file:

```
TRLI DEPT,1000A7001234
TRLI ACCOUNTG,1000A7002001
TRLI BILLING,1000A7003579
```

*Note: The first parameter on the TRLI entry is the link name. The link name can be any name by which you wish to refer to this link. It is best to give the link a name which you are familiar with and which uniquely identifies the system being attached. For our example, we are attaching to our department's system, the accounting department's system, and the billing department's system. Thus, DEPT, ACCOUNTG, and BILLING are good link names.*

With these entries in the CONFIG.S36 file, STARTRTR will process each entry individually. As each entry is processed, an attempt is made to communicate to the system corresponding to the specified adapter address. If communications is successful, you are prompted for the user-ID and password for that system. Therefore, it is necessary for you to have proper authorization for each system to which you are connecting. If your ID and password are acceptable to the System/36, the link started successfully.

The first link started (in this example, the department system) is always the default link. This means that all the virtual disk, virtual print, and transfer facility requests will be directed to this system. Since this is the system you use most often throughout the day, it is important that its TRLI entry be the first in the configuration file.

At this time, you may wish to use SETVDSK or CFGVDSK to create and/or assign the virtual disks you are going to use throughout the day.

## Changing the Default Link

As stated in the previous section, the first TRLI entry successfully processed in the router configuration file determines the default link. All virtual disk, virtual printer, and transfer facility activity takes place on the default link.

If you wish to direct activity to one of the other active links, you will have to make that link the default link. To do this, you will have to have the STARTRTR command process a configuration file that contains a TRDL entry corresponding to the link you wish to make the default.

To do this, you would normally create an alternate router configuration file with the corresponding TRDL entry contained in it.

Using the previous example, when the router was first started, the DEPT link became the default. From it, we assigned various virtual disks.

If you now wanted to run a transfer request to get a file from the accounting system, you would first have to make the accounting system the new default system. To do this, you would have to create an alternate router configuration file.

For example, create a file called ACCOUNTG.DEF that contains the following statement:

```
TRDL ACCOUNTG
```

Now, when you execute the following:

### **STARTRTR ACCOUNTG.DEF**

The router will recognize this as a request to change the default link and process the request. When this command successfully completes, the ACCOUNTG link will become the default link. It is now possible to run a transfer facility request to download a file from the accounting department's system to your personal computer.

Any virtual disks that you had previously assigned when DEPT was the default link are still active and usable. Therefore you could download a file from the accounting system to a virtual disk on your department's system.

Any virtual disks you assign from this point on, however, will be directed to the new default link, ACCOUNTG. If this is not what you want, you may wish to create another configuration file called DEPT.DEF with the following statement:

### **TRDL DEPT**

Now, when you execute the following:

### **STARTRTR DEPT.DEF**

The router will change the default link back to DEPT.

Similarly, you will want to create a configuration file called BILLING.DEF in order to make BILLING the default link when you want to access information on the billing department's system.



## Starting Additional Links

Perhaps there is a System/36 attached to your IBM Token-Ring Network that you access infrequently, perhaps weekly or monthly, or on an as-needed basis. To access it, you would have to start a new link to it in addition to your already active links.

To do this, you need to create an alternate router configuration file with the appropriate TRLI entry to start a link with that system and then run STARTRTR with that configuration file specified as a parameter.

For our example, let's assume that you already have active links to your department's system, the accounting department's system, and the billing department's system and that now you have a need to use the high-speed printer that is attached to the shipping department's System/36.

To do this, you could create a router configuration file called SHIPPING.S36 that contains the following entry:

```
TRLI SHIPPING,1000A5004152
```

```
TRDL SHIPPING
```

Now, when you enter the following command:

```
STARTRTR SHIPPING.S36
```

The router will interpret this as a request to start an additional link and will prompt you for your user-ID and password for this system.

Since there is also a TRDL entry in this file (the TRDL entry is optional), the router would also make SHIPPING the default link so that it is immediately usable to the virtual printer facility. Without the TRDL entry, the default link would not have changed and you would have had to change it in a separate step.

*Note: If you wished, you could have used this method to start all your links separately rather than placing multiple TRLI entries in one configuration file.*

## Stopping a Link

When you are through using the services of a particular System/36 and wish to terminate communications to that System/36 in order to free up resources on the network and on the System/36, or you need to stop a link because you wish to start a new link but already have the maximum of six links active, you can stop the link you have to one System/36 without affecting the other links you currently have active.

This is done using the STARTRTR command which specifies a configuration file that has a TRLI entry for the link you wish to stop. The TRLI entry must specify the name of an active link, but must not specify the link's adapter address. A TRLI entry without an adapter address will be interpreted by STARTRTR as a request to stop the corresponding link.

For example, in the previous section, an additional link was started with the shipping department's System/36 in order to use one of its printers. When you are done using this printer, you may wish to release any virtual printers you have assigned to it and then stop the link.

In order to stop the link, you could create a router configuration file called SHIPPING.STP with the following entry:

### **TRLI SHIPPING**

Then, when you run the following command:

### **STARTRTR SHIPPING.STP**

The router would interpret this as a request to stop the link it has with the shipping department's System/36. If this were also the default link, the router would search its link table for the first active link. In this case, that would be the DEPT link. DEPT then becomes the new default link.

*Note: STARTRTR can be used to stop individual active links. STOPRTR on the other hand is used to stop all active links and causes the router to remove itself from the network altogether. STOPRTR should be run before restarting or powering off your PC.*

# Using Message Facility on Multiple Systems

You can use the support provided by STARTRTR to use the message facility on multiple systems. All of the message facility commands will be run on the default link that has been set up by the router.

If you do not wish to use STARTRTR to change your default links as described in the previous section, the message facility allows you to specify the system to send and receive messages on with an MDEF entry in the configuration file. Refer to Chapter 2, "The PC Support/36 Configuration File," for the format of this entry.

For example, assume that you have started the links in the previous example.

```
TRLI DEPT,1000A7001234
TRLI ACCOUNTG,1000A7002001
TRLI BILLING,1000A7003579
```

Your default link is DEPT. You can start the message facility on link BILLING by entering the following command:

**STARTMSG file-name**

where:

**file-name** is the name of a configuration file that contains the following entry:

**MDEF BILLING**

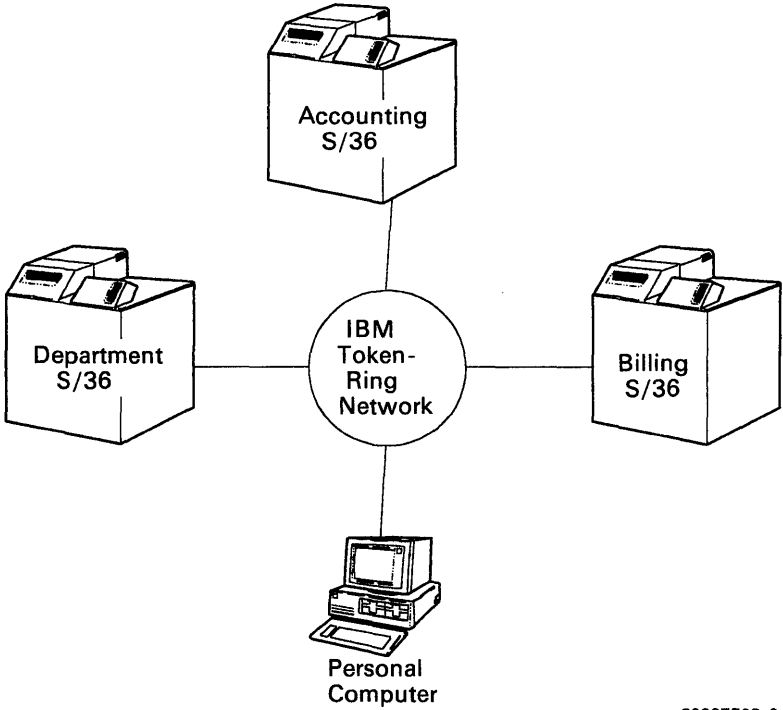
# Using Shared Folders on Multiple Systems

Shared folders provides a parameter on the FSPC ASSIGN command which will allow you to directly access a folder on any of the System/36's that you have an active link to without changing your default link. The format of this command is:

**FSPC ASSIGN path //System/36**

where:

**System/36** is the corresponding link-name from the TRLI entry in the configuration file.



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For example, assume that you have started a link with the following TRLI entries:

```
TRLI DEPT,1000A7001234  
TRLI ACCOUNTG,1000A7002001  
TRLI BILLING,1000A7003579
```

Your default link is DEPT. You can assign folder ACCTFLDR on link ACCOUNTG by entering the following command:

**FSPC ASSIGN ACCTFLDR //ACCOUNTG**

or you can assign folder DEPTFLDR on link DEPT by entering one of the following commands:

**FSPC ASSIGN DEPTFLDR**

or

**FSPC ASSIGN DEPTFLDR //DEPT**

## **PC Support/36 Pass-Through**

PC Support/36 Pass-through can be used with the emulation programs and the IBM Token-Ring Network.

As mentioned in the previous section, the PC Support/36 router has the capability of maintaining communications to multiple System/36s. PC Support/36 Pass-through allows PC Support/36 applications to pass through one system to another system via an APPC or APPN connection.

You can indicate that you wish to use PC Support/36 Pass-through by specifying a remote system name parameter on the TRLI entry in your IBM Token-Ring router configuration file or an EMLI entry in the emulation router configuration file. The remote system name must match the remote system name as known by APPC or APPN.

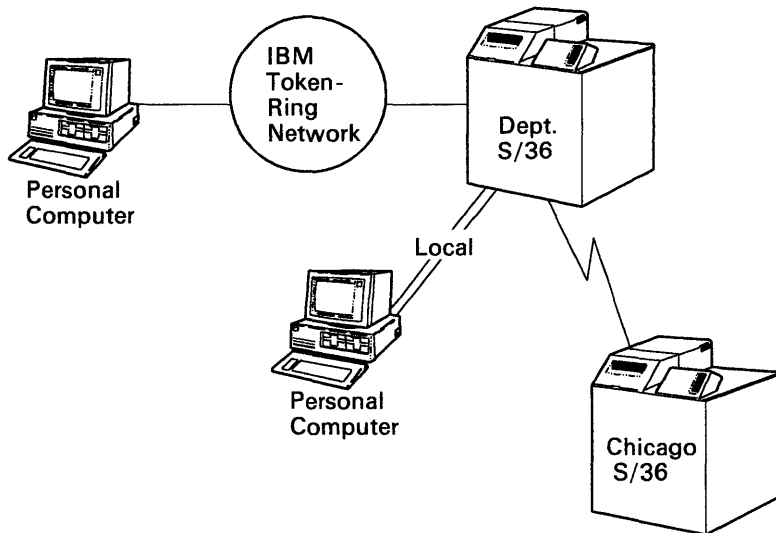
If you provide a remote system name parameter on your TRLI entry or EMLI entry, then whenever you use one of the PC Support/36 applications such as virtual disk or virtual printer, that application will use the resources on the remote system rather than the system with which you have an active link. The exceptions to this are shared folders and the message facility, they do not have to default to this System/36.

This can best be explained with an example.

Assume that, as in the example in the previous section you have an active link to your department's system and that you have named that link DEPT. Assume also that your department system has an APPC connection to your headquarters system in Chicago. This connection is most likely over the telephone lines via SDLC. The System/36 in Chicago is known to APPC on your department's system by the name CHICAGO.



Let's also assume that there is a file on the headquarters system in Chicago that you need to download using the PC Support/36 transfer facility. Assuming the remote system in Chicago has PC Support/36 installed on it, you can use PC Support/36 Pass-through to have the transfer request executed on the remote system rather than on your department's system.



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To do this, you would have to start the router using a configuration file that contains the following entry:

```
TRLI DEPT,1000A7001234,,CHICAGO
```

When STARTRTR is run, it would interpret this entry as a request to start a link to the System/36 that has an IBM Token-Ring adapter address of 1000A7001234 (which, in this case, is your department's system). In addition, the remote system name parameter of CHICAGO indicates to the router that all application requests should be passed through this system to a remote system named CHICAGO. It is the department system's responsibility to make sure the request gets forwarded properly to the remote system.

If the link to DEPT was already established, the router would interpret this entry as a request to change the destination of an application request from the department system to the remote system. It will therefore display a message indicating that the remote system name has been changed.

Now, when the transfer facility is run, the transfer request is passed through the department system to the system in Chicago. This way, the required file on the headquarters system in Chicago may be accessed and downloaded to the personal computer.

*Note: If there were multiple links active to multiple systems on the IBM Token-Ring Network, you must make sure that DEPT is the default link. If it is not the default link, the transfer request will be directed to the system that corresponds to the current default link.*

# PC Support/36 Pass-Through Prerequisites

In order to use PC Support/36 Pass-through, the following requirements must be met:

- APPC or APPN must be configured and enabled both on the system you have a link with and the remote system. See the *System/36 ICF Reference* manual for information on how to configure and enable APPC and APPN.
- PC Support/36 must be installed on both systems; however, it only needs to be enabled on the system with which you have a link.
- You must specify a remote system name parameter on the TRLI or EMLI entry for the system with which you have a link. This remote system name must match the name of an active APPC or APPN system. Refer to Chapter 2, “The PC Support/36 Configuration File,” for more information on how to specify a remote system name parameter on the TRLI or EMLI entry.
- You may only pass through from the default link. See the previous section, “Changing the Default Link,” for information on how to change the default link.

# Using Shared Folders on PC Support/36 Pass-Through

Shared folders provides a parameter on the FSPC ASSIGN command which allows you to directly access a folder on a remote system by entering the following command:

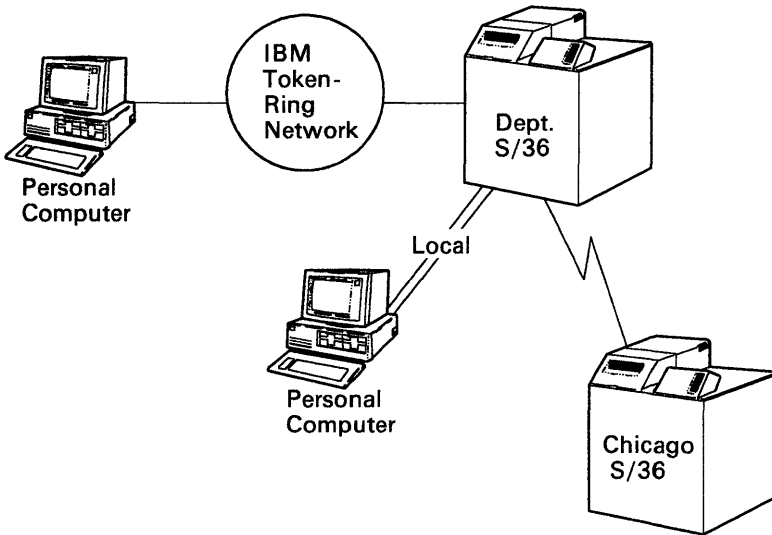
**FSPC ASSIGN path //System 36**

where:

**System 36** is the remote system name as known by APPC or APPN.

## IBM Token-Ring Network

When you specify a system name on the FSPC ASSIGN command, the router first looks for a match on link-name in the active links. If no match is found, the router looks at the remote system name if any is currently set up by the router. If no match is found, the router attempts to start the shared folders application on the specified system by passing through the default system.



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For example, assume that you have started a link to system DEPT with the following configuration file:

```
TRLI DEPT,1000A7001234
```

You can assign folder CHICFLDR on system CHICAGO by entering the following command:

```
FSPC ASSIGN CHICFLDR //CHICAGO
```

and you can assign folder DEPTFLDR on system DEPT by entering one of the following commands:

```
FSPC ASSIGN DEPTFLDR
```

or

```
FSPC ASSIGN DEPTFLDR //DEPT
```

## Using Message Facility on PC Support/36 Pass-Through

You can use the support provided by STARTRTR to use the message facility on a remote system. All of the message facility and facility commands will be run on the default link to any remote system that has been set up by STARTRTR, unless you have an MDEF entry that specifies another link.

If you do not want to use STARTRTR to start the message facility on a remote system, the message facility allows you to specify the system to send and receive messages on with an MDEF entry in the configuration file. Refer to Chapter 2, "The PC Support/36 Configuration File," for the format of this entry.

If you specify a system name in an MDEF entry when starting the message facility, the router will first look for a match on link name in the active links. If no match is found, the router will look at the remote system names (if any are currently set up by the router). If no match is found, the router will attempt to start the message facility on the specified system by passing through the system that is the default link.

Remember that the message facility is only active on one system at a time.

For example, assume that you have started the link to the DEPT system which has a remote connection to system CHICAGO (see router example). You would have started the router with the following entry in your configuration file:

```
TRLI DEPT,1000A7001234
```

You can start the message facility on system CHICAGO by entering the following command:

**STARTMSG file-name**

where:

**file-name** is the name of the configuration file with the following entry:

**MDEF CHICAGO**

or, you can start the message facility on system DEPT by entering one of the following commands:

**STARTMSG**

or

**STARTMSG file-name**

where:

**file-name** is the name of the configuration file with the following entry:

**MDEF DEPT**

# Using Shared Folders on PC Support/36 Pass-Through

Shared folders provides a parameter on the FSPC ASSIGN command which will allow you to directly access a folder on a remote system by entering the following command:

**FSPC ASSIGN path //System/36**

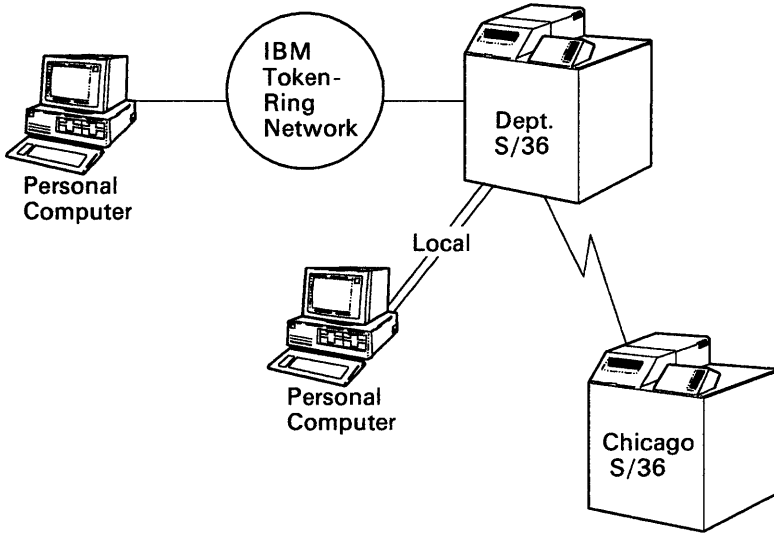
where:

**System/36** is the remote system name as known by APPC or APPN.

## IBM Token-Ring Network

When you specify a system name on the FSPC ASSIGN command, the router will first look for a match on link-name in the active links. If no match is found here, the router will look at the remote system names if any are currently set up by the router. If no match is found, the router will attempt to start the shared folders application on the specified system by passing through the system that is the default link.





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For example, assume that you have started a link to system DEPT with the following configuration file:

```
TRLI DEPT,1000A7001234
```

You can assign folder CHICFLDR on system CHICAGO by entering the following command:

```
FSPC ASSIGN CHICFLDR //CHICAGO
```

and you can assign folder DEPTFLDR on link DEPT by entering one of the following commands:

```
FSPC ASSIGN DEPTFLDR
```

or

```
FSPC ASSIGN DEPTFLDR //DEPT
```

## **5250 Emulation**

Since you can only have one link with 5250 Emulation, any system name that you provide on the ASSIGN command will be used to pass through the emulation attached system. Therefore, to assign folder CHICFLDR on system CHICAGO through system DEPT, you would enter the following command:

```
FSPC ASSIGN CHICFLDR //CHICAGO
```

and you would assign folder DEPTFLDR on system DEPT with this command:

```
FSPC ASSIGN DEPTFLDR
```

# Stopping PC Support/36 Pass-Through

If you wish to stop using PC Support/36 Pass-through, but do not want to bring down the link you have with the system being passed through, simply run STARTRTR again specifying a configuration file that has a TRLI or EMLI entry with no remote system name parameter.

For example, if you had an IBM Token-Ring router configuration file with the following entry:

```
TRLI DEPT,1000A700123
```

then, when STARTRTR is run, it will interpret this entry as a request to change the remote system name to null, thus effectively stopping pass-through from this system. Application requests will now be directed to the DEPT system rather than being passed through to a remote system.

Or, if you had an emulation configuration file with the following entry:

```
EMLI
```

with no remote system name specified and STARTRTR is run, this would stop pass-through.

Any applications that are using pass-through at the time STARTRTR is run will still be using pass-through.

# Chapter 4. The Virtual Disk Facility

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# Prerequisites

The PC Support/36 router must be running before you can use the virtual disk facility.

The PC Support/36 router, called STARTRTR.EXE, must be run after emulation or the IBM Token-Ring Network is started. Refer to Chapter 3, "The PC Support/36 Routers," for more information on the PC Support/36 routers.

## Virtual Disk Facility Programs

The virtual disk facility consists of three programs that are used in addition to emulation or the IBM Token-Ring Network, and the router. These programs are:

- VDSK.SYS, which is the virtual disk device driver. This program must be installed before you can use any of the other virtual disk facility programs.
- SETVDSK.COM, which allows you to interactively create, delete, assign, and release virtual disks.
- CFGVDSK.COM, which allows you to automatically assign or release virtual disks using entries in the CONFIG.S36 file or a VDSK setup file. For details on VDSK setup files, refer to Chapter 5, "Using the PC Support/36 Virtual Disk Facility," in the *PC Support/36 User's Guide*.

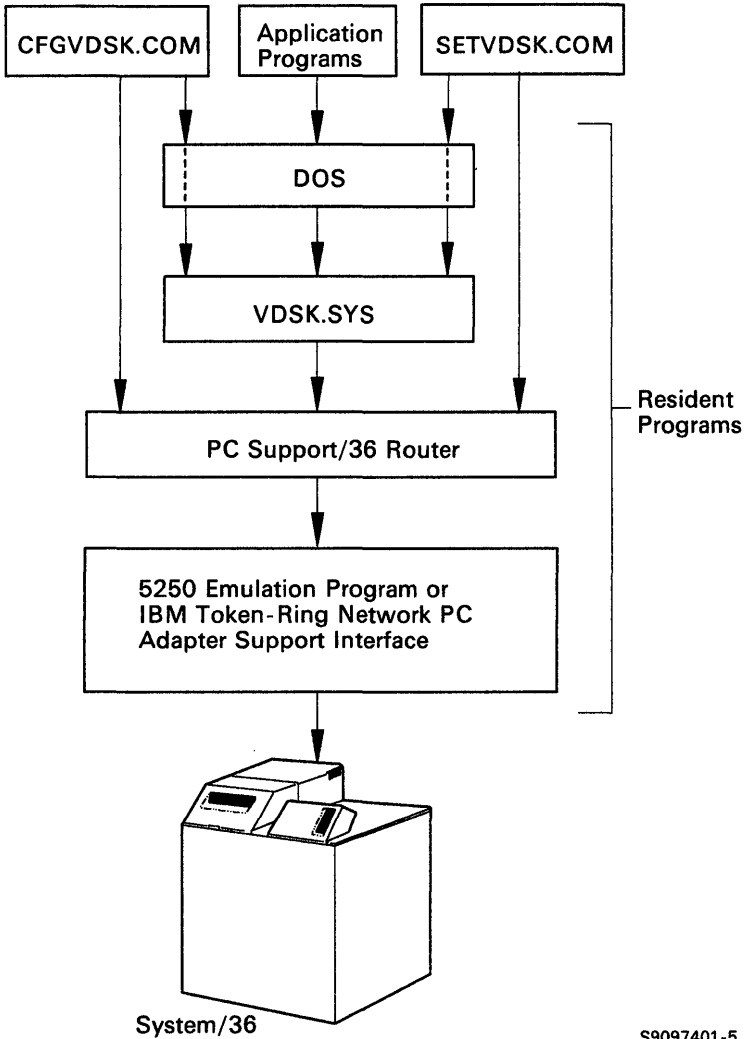
The VDSK.SYS program is installed when you power on or restart your personal computer. It is started when DOS processes the `DEVICE = VDSK.SYS` command in the `CONFIG.SYS` file. (This command is added to your `CONFIG.SYS` file when you run the `INSTALL` command. For more information, refer to Chapter 1, "Installation.")

When installed, VDSK.SYS becomes a resident part of the DOS operating system. This means that VDSK.SYS will take up a portion of the storage available in your personal computer to run other programs.

The SETVDSK.COM program allows you to create, delete, assign, and release virtual disks. The CFGVDSK.COM program allows you to assign and release virtual disks. SETVDSK.COM and CFGVDSK.COM run as personal computer applications and do not take up any permanent storage. However, you must have enough storage left after emulation or the IBM Token-Ring Network, the router, and the VDSK.SYS program are installed to run at least one of these programs.

You are not required to run both SETVDSK.COM and CFGVDSK.COM. For example, if you plan only to assign virtual disks but not create or delete them, you need only run the CFGVDSK.COM program.

The following shows the relationship between the virtual disk facility programs:





The VDSK.SYS program is installed and runs under DOS. The CFGVDSK and SETVDSK programs communicate with the VDSK.SYS program through DOS function calls (using interrupt hexadecimal 21). Application programs pass virtual disk input and output requests to DOS, and DOS passes the requests to the VDSK.SYS program.

All three virtual disk programs communicate directly with the router, which manages communication through the emulation link. The interface to the router is through software interrupt hexadecimal 68. This interrupt can be changed to another value using the INTL entry in the CONFIG.S36 file. For information on using INTL, refer to Chapter 2, "The PC Support/36 Configuration File."

# The VDSK.SYS Program

VDSK.SYS is the device driver portion of the virtual disk facility. The VDSK.SYS program is installed when your personal computer is powered on or restarted, and DOS finds a `DEVICE = VDSK.SYS` entry in the `CONFIG.SYS` file. (This entry will be added to `CONFIG.SYS` at install time. Refer to Chapter 1, "Installation," for more information.)

Once installed, VDSK.SYS becomes a permanently resident part of DOS. It requires approximately 24K bytes of resident storage on the personal computer.

You can specify the number of virtual disk drives (from one through eight) you want to use by specifying a parameter on the `DEVICE` statement in the `CONFIG.SYS` file. However, changing this value will not affect the amount of resident space VDSK.SYS requires. If you do not specify the number of virtual disk drives, eight is assumed.

*Note: Installing more than one copy of VDSK will not allow you to use more than eight virtual disk drives; it will only use more storage space on your personal computer.*

## **The SETVDSK.COM Program**

The SETVDSK.COM program allows you to interactively create, assign, release, and delete virtual disks.

SETVDSK.COM communicates with the System/36 through the router and the emulator. You can use a batch program called ISETVDSK which automatically installs the router and then runs SETVDSK. If the router has already been installed, it will not be installed a second time.

## **The CFGVDSK.COM Program**

The CFGVDSK.COM program allows you to automatically assign and release virtual disks.

The CFGVDSK.COM program assigns and releases virtual disks using VDSK entries in the CONFIG.S36 file or a VDSK setup file. You can use as many VDSK entries as you want in the CONFIG.S36 file or VDSK setup file to assign and release virtual disks.

The following is an example of a CONFIG.S36 file with VDSK entries:

```
SUPPORT/36  
VDSK H,MYDISK,2  
VDSK J,TAX84  
VDSK F
```

Using this sample CONFIG.S36 file, the CFGVDSK program would assign the virtual disk MYDISK to drive H and the virtual disk TAX84 to drive J; the virtual disk assigned to drive F would be released.

For details on how to create a CONFIG.S36 file and what to enter, refer to Chapter 2, “The PC Support/36 Configuration File.”

You can use the CFGVDSK.COM program to automatically assign a set of virtual disks each time you power on or restart your personal computer. To do this, you must add the CFGVDSK command to your AUTOEXEC.BAT file.

*Note: If CFGVDSK runs and cannot find the CONFIG.S36 file (or VDSK setup file, if specified), or there are no VDSK entries in the CONFIG.S36 file (or VDSK setup file, if specified), CFGVDSK displays an error message and ends without doing anything.*

For details on how to specify the VDSK setup file, refer to Chapter 5, “Using the PC Support/36 Virtual Disk Facility,” in the *PC Support/36 User's Guide*.

## **Batch Error Level Codes Set by CFGVDSK**

If you are running a batch file, CFGVDSK sets a return code that can be checked by the DOS batch file command IF ERRORLEVEL. When all entries are processed successfully, the error level is 0. If an error occurs, but you choose to continue the operation anyway, the error level is set to 10 (hexadecimal 0A). If an unrecoverable error occurs, or you choose to abort the CFGVDSK program, the error level is set to 20 (hexadecimal 14).

# Creating an AUTOEXEC.BAT File for Virtual Disk

If you frequently use the virtual disk facility, it is recommended that you create an AUTOEXEC.BAT file containing all of the commands required to start the virtual disk facility. This can be especially useful if you usually use the same virtual disks.

The following example shows what the contents of an AUTOEXEC.BAT file might look like and assumes you are using Enhanced 5250 Emulation (*rem* means the line is a comment line):

```
rem Prompt for the correct date and time
rem (optional)
DATE
TIME
rem Install the 5250 Emulation Program.
rem The parameters P and T are optional:
rem P tells the emulation program to skip
rem the presign-on display and use the PC
rem keyboard layout.
rem T tells the emulation program to skip 5250
rem emulation mode and go to the DOS
rem prompt. You will not need to sign on
rem the System/36 at this time.
rem Note: If you have the Enhanced 5250
rem Emulation Program or the Remote
rem 5250 Emulation Program, refer to the user's
rem manual to determine the correct command or
rem installation procedure to use.
DE5250 P
rem Start the PC Support/36 5250 router.
rem When the System/36 sign-on display appears,
rem enter your System/36 user ID and password.
STARTRTR
rem Automatically assign the virtual disks
rem requested using VDSK entries in the PC
rem Support/36 CONFIG.S36 file.
CFGVDSK
```

In addition to the AUTOEXEC.BAT file, you also need two other files on the disk or diskette from which you are powering on your personal computer:

- A CONFIG.SYS file that has the  
DEVICE = VDSK.SYS command to install  
VDSK.SYS.
- A CONFIG.S36 file that has the VDSK entries  
(refer to Chapter 2, “The PC Support/36  
Configuration File”) for the virtual disks you  
want assigned.

# How Virtual Disks Differ from Physical Diskettes

In most cases, virtual disks function the same way as physical personal computer diskettes and fixed disks. The exceptions are:

- You cannot power on or reset your personal computer from a virtual disk. This is because the earliest the virtual disk programs can be installed is when the personal computer is powered on. This means that you must have at least one physical diskette drive or fixed disk in order to use the virtual disk facility.
- Virtual disks cannot be formatted using the DOS FORMAT command. They are automatically formatted when they are created.

A virtual disk is formatted in much the same way as a hard disk formatted using a DOS 2.1 FORMAT command. If you are using a virtual disk that is larger than 10 megabytes, you will not be able to store as many files on the virtual disk as you could on a hard disk of the same size formatted using a DOS 3.0 or later FORMAT command.

- The DOS DISKCOPY function does not work for virtual disks. This is because the DISKCOPY function requires the format of the virtual disks to be the same as the physical diskettes. However, virtual disks do not have the same format as physical diskettes.
- The DOS DISKCOMP function does not work for virtual disks. This is because virtual disks do not have the same format as physical diskettes, and DOS expects the format of the disks or diskettes being compared to be the same.
- The DOS SYS function, which writes DOS operating system files to a diskette, does not work for virtual disks. This is because the SYS function requires the diskette to be formatted with either the /S or /B option on the DOS FORMAT command. However, the DOS FORMAT command does not work for virtual disks.
- You cannot change virtual disks while a personal computer application is running, as you can physical diskettes. This is because you must use the SETVDSK or CFGVDSK program to assign and release virtual disks. You must assign all virtual disks needed by a particular application before starting the application.



# Using System/36 Utilities for Virtual Disks

When you create a virtual disk using the virtual disk facility, the virtual disk is created and maintained on the System/36 as any other System/36 file. The name you give a virtual disk when you create it is the name that is given to the System/36 file that contains it. For this reason, the System/36 will not allow you to give a virtual disk the same name as an existing System/36 file.

The System/36 utilities that work with entire files will, in most cases, also work with virtual disks. For example, you can perform System/36 functions such as SAVE and RESTORE for a virtual disk, just as you would for any System/36 file.

*Note: Remember that the format of the data within the virtual disk is compatible with DOS and not the System/36. This means that most System/36 utilities that work with the data within files will not be able to recognize or work with the data within the virtual disk.*

It is recommended that you use only the following System/36 utilities with virtual disks:

- **CATALOG:** Lists the System/36 information about a virtual disk.
- **SAVE:** Saves a virtual disk to a System/36 diskette or tape.
- **RESTORE:** Restores a virtual disk from tape or diskette to the System/36.
- **DELETE:** Deletes a virtual disk from the System/36.
- **RENAME:** Changes the name of a virtual disk.
- **SECEDIT:** Displays a series of menus to step you through resource security. For more information on SECEDIT, refer to the *IBM System/36 System Reference* manual.

*Notes:*

1. *If you use RENAME to change the name of a virtual disk, you must use the new name when accessing it using PC Support/36.*
2. *You should be aware that the RENAME utility does not change the volume name that is displayed by the DOS DIR command. To change the volume name to match the virtual disk name, you must use the DOS LABEL command (available with DOS 3.0 and later versions of DOS). Refer to the **IBM Personal Computer Disk Operating System** manual for details.*

# Virtual Disk Format

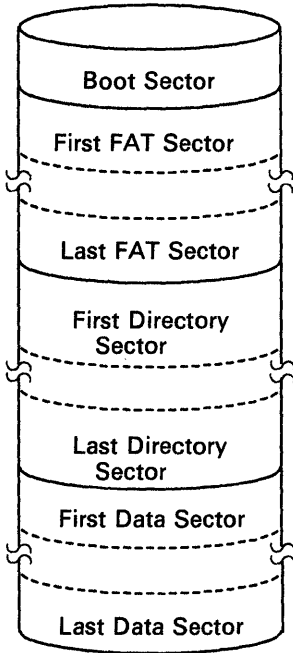
All PC Support/36 virtual disks have the same basic format, which is very similar to that of a physical diskette formatted by DOS. Each disk is divided into a number of 512-byte sectors.

## Parts of a Virtual Disk

Like a diskette formatted by DOS, a virtual disk is comprised of four main parts:

- Boot sector
- File allocation table
- Directory
- Data sectors

The following diagram shows the parts of a virtual disk:



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## **The Boot Sector**

The boot sector contains the BIOS parameter block and occupies the first sector of every virtual disk. For details on the BIOS parameter block, refer to the *IBM Personal Computer Disk Operating System Technical Reference* manual.

## **The File Allocation Table**

The file allocation table (FAT) is used by DOS to manage the free space on the disk and to track where the data for files appears. Unlike diskettes formatted by DOS, only one copy of the file allocation table is kept on a virtual disk. Each entry in the file allocation table is 12 bits long, and the total table can be from 1 to 12 sectors in size, depending on the size of the virtual disk.

## **The Directory**

The directory follows the file allocation table. The directory is made up of a number of directory entries containing information about the files on that virtual disk.

Each directory entry is 32 bytes long, and can contain information about one of the files on the virtual disk. (Refer to the *IBM Personal Computer Disk Operating System Technical Reference* manual.) Since 16 directory entries will fit within one 512-byte sector, there will be from 1 to 128 sectors in the directory, depending on the directory size specified when the virtual disk was created.

## The Data Sectors

The data sectors contain the actual data files. The number of sectors available for data is equal to the total size of the virtual disk minus the boot sector, file allocation table, and directory.

## Clusters

As on physical DOS diskettes, the space for data files on virtual disks is allocated in fixed portions, called *clusters*. A cluster can be from 1 to 32 sectors (512 to 16384 bytes) in size.

The size of a cluster can affect the amount of storage available, as well as performance. A larger cluster size wastes storage space because the cluster size is the minimum amount of space a file can allocate. However, a large cluster size reduces the size of the file allocation table. In some cases, this could improve performance. Refer to "Performance Considerations" later in this chapter for more details.

PC Support/36 sets the cluster size for a virtual disk when the virtual disk is created. This size is based on the size specified for the virtual disk. The cluster size created is as small as possible (the minimum is 1 sector), as long as the file allocation table size is 12 sectors or less. If the size of the file allocation table is greater than 12 sectors, the cluster size doubles until the file allocation table is 12 sectors or less in size. For example, a 32 megabyte disk would use a cluster size of 32 sectors.

# Sharing Virtual Disks

An advantage of using virtual disks is that they can be shared by a number of personal computer users at one time, while physical diskettes cannot. However, if you intend to share a virtual disk, you should understand how virtual disks are shared.

Sharing of a virtual disk is controlled by the access level assigned to that disk. When you assign a virtual disk, you must specify the access level for the disk. You can specify any one of three access levels for a virtual disk. They are:

- *Exclusive*, which means that you can read and write to the virtual disk or diskette, but no other users can access the virtual disk or diskette as long as you have it assigned. You will be able to assign the disk or diskette at this level only if no one else is using it. No other users can assign this disk or diskette until you release it.
- *Read/Write*, which means that you can read and write to the virtual disk or diskette, and other users can assign and only read it. If another user has the virtual disk or diskette assigned with an access level of *Exclusive* or *Read/Write*, you will not be able to assign it using an *Exclusive* or *Read/Write* access level.

- *Read*, which means that you can read the virtual disk or diskette, but not write to it. Other users can read and write to it.

You would use this access level if you want to be able to read information on a particular disk or diskette, but not be able to accidentally change the information. If another user has the virtual disk or diskette assigned with an access level of *Exclusive*, you will not be able to assign it using an access level of *Read*.

*Note: Assigning a virtual disk with an access level of Exclusive or Read/Write protects the virtual disk only for the time that you have the disk assigned. Once you release the disk or power off your personal computer, the disk is no longer protected. Refer to "Virtual Disk Security" later in this chapter for details.*

PC Support/36 allows only one user to assign a virtual disk at a level that allows write access. This means that, if you want to share a virtual disk with another user, and you both want to be able to write to the virtual disk, you must take turns assigning it using an access level of *Read/Write*.

For example, if two users want to be able to write to the same virtual disk, both users must initially assign the disk using an access level of *Read*. When the first user wants to write to the virtual disk, he must reassign the disk using an access level of *Read/Write*. When the first user is finished writing to the virtual disk, he must reassign the virtual disk using an access level of *Read* so that the second user can write to the virtual disk. (The second user must reassign the virtual disk with an access level of *Read/Write*.)

# Considerations for Sharing Virtual Disks

You should be aware of the following when sharing virtual disks:

- If you have Read access to a virtual disk while another user is writing to the virtual disk, you may not have the latest copy of the information on the virtual disk. This is because DOS stores in a buffer the information on the virtual disk (including the directory and file allocation table) and is not aware that another user at another personal computer has changed the information.

In fact, you might be able to retrieve information that the other user has actually erased. This is because DOS erases a file by clearing the directory entry for it, without erasing the actual data. Although the directory on the virtual disk indicates that the file is no longer there, the directory that your copy of DOS is working with still shows that it exists, and can still access the data.



If a new file is created on the same virtual disk using the sectors that were previously being used by the file that was just erased, it is possible that you could actually retrieve information from the wrong file. In this case, the results are unpredictable.

*Note: If you have read access to a virtual disk and another user is writing to it, you can assure that you have the latest copy of the information by assigning the virtual disk again with an access level of read. This forces DOS to clean the buffer and refresh it with the actual data from the virtual disk.*

- A virtual disk may contain sensitive information that should be shared only with certain other users, or information that should not be shared at all. Refer to “Virtual Disk Security” for details on how to protect such information.

# Redirection of Virtual Disk Drives

DOS and various other programs allow drives to be redirected. This redirection causes any input or output directed to a particular drive to be redirected to another drive. If you are using DOS 3.0 or a later compatible release of DOS, the PC Support/36 virtual disk programs are able to determine when a virtual disk drive has been redirected.

SETVDSK and CFGVDSK recognize when a drive has been allocated to the virtual disk facility, and redirected by another program. If an attempt is made to assign or release a virtual disk from the redirected virtual disk drive, an error message is displayed. Before this drive can again be considered a virtual disk drive, the redirection of the drive must be reversed. Once the drive is returned, the original status of the drive is restored. For example, any virtual disk assigned to the restored drive will be available as if nothing had happened.

The interactive virtual disk program, SETVDSK, can be used to determine which virtual disk drives have been redirected. SETVDSK indicates which drives are redirected by de-emphasizing the highlighting on an assigned drive and by placing an asterisk by the drive letters that have been redirected.

On the following display, the virtual disk facility no longer has control over drives G and M. They have been redirected.

```

-----SET VIRTUAL DISKS-----
DRIVE  DISK NAME  ACCESS LEVEL  SIZE (KB)  DIR SIZE
F      -        -             -          -
G*     SMPDK.45  Exclusive     360        112
H      -        -             -          -
I      #IWPCLD2  Read         1390       98
J      -        -             -          -
K      -        -             -          -
L      -        -             -          -
M*     -        -             -          -

-----OPTIONS-----
Select one of these options; press Enter.
1 Assign virtual disks
2 Release virtual disks
3 Create a new virtual disk
4 Delete an existing virtual disk
5 Exit

Select ==> 1

Esc=Exit
-----Version 04.00 (c) IBM Corp. 1987-----

```

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# Virtual Disk Security

Because virtual disks can be accessed from both the System/36 and the personal computer, it is important that you take the steps necessary to ensure the security of your PC Support/36 virtual disks. A virtual disk may contain sensitive information that should not be shared by other users, or information that you want to protect against unauthorized change, destruction or misuse.

You should be aware that *assigning a virtual disk with an access level of Exclusive or Read/Write protects the virtual disk only for the time that you have the disk assigned*. Once you release the disk or power off your personal computer, the disk is no longer protected. Because a virtual disk is treated as a file on the System/36, it can only be protected using System/36 resource security.

This section will not provide you with the details of System/36 security procedures. The purpose of this section is to briefly describe those procedures as they apply to virtual disk security. For details on System/36 resource security procedures, refer to the *System/36 System Security Guide*.

# System/36 Resource Security

You can secure a virtual disk the same way you would secure any other file on the System/36. To do this, contact your System/36 security officer to add an entry to the System/36 resource security file for your virtual disk.

System/36 resource security allows you to specify various levels of authorization for specific users through their System/36 user identification. It also allows you to specify a default access level for all other System/36 users. System/36 resource security secures your virtual disk from unauthorized System/36 users as well as other personal computer users.

If you know what name you will give the virtual disk, resource security can be set up on the System/36 before the virtual disk is actually created. This allows you to control which user is authorized to create the virtual disk.

The access levels that can be used to secure a virtual disk are:

- *Owner:* You will usually want this level of authority for virtual disks that you create and maintain. As the owner of a virtual disk, you can assign it at any access level. You can create and delete the disk, as well as change its name using the System/36 rename procedure. You can also change the resource security entry for the virtual disk using the System/36 SECEDIT procedure. This allows you to control access of the virtual disk by other users.

More than one user can have this level of authority.

- *Change:* This level of authority allows you to create, delete, and assign a virtual disk at any level. However, you cannot change the authorization of other users for the virtual disk, or rename the virtual disk.
- *Update:* This level of authority allows you to assign the virtual disk at any level, but not create or delete the virtual disk. However, you can create and delete any files on the virtual disk.
- *Read:* This level of authority allows to you read the virtual disk, but not write to it. Other users may be able to read and write to the virtual disk. If you have Read authority, you will not be able to create, delete, or write to the virtual disk.
- *None:* This level of authority prevents you from accessing the virtual disk. This level of authority is usually used as the default access level to prevent unauthorized users from accessing the virtual disk. The name of the virtual disk will not appear in the list of virtual disks available for the user to assign if the user has this level of authority.

## Examples

- Assume you have a virtual disk that you want no other users to access. The entry for that virtual disk in the System/36 resource security file would specify you as the owner of the disk, and would have a default access level of None.
- Assume you have a virtual disk that you want to allow anyone to read, but you want only a few users to be able to write to it. You want to be the only user able to create, delete, or rename the virtual disk.

In this case, the resource security entry would specify you as the owner of the virtual disk, and a few specific users would have Update authority. The default authority would be Read.

- The virtual disk #IWPCLD2, created when PC Support/36 was installed, can also be protected from being accidentally deleted by assigning a default access level of Update or lower.

## Security Considerations

You should be aware of the following concerns regarding security of information on virtual disks:

- Although resource security is available on the System/36, it is possible that your System/36 is not using resource security. In this case, contact your System/36 system administrator or security officer to have resource security set up on your System/36. System/36 resource security is the only effective way to secure the information on your virtual disks.
- System/36 resource security protects the entire virtual disk. You cannot protect only certain files on a virtual disk, or give different files different levels of security.

If you need to have more than one level of security, you must create several virtual disks and place the files on each disk according to the level of security required for each file.

- Your virtual disks are only as secure as the password you use to sign on to the System/36. If another user knows your user identification and password, that user will be able to access your virtual disks just as you do. Therefore, you should use caution where your System/36 user identification and password are concerned.



# Performance Considerations

A number of things can affect PC Support/36 virtual disk performance. The purpose of this section is to give you some ideas on how you can improve your virtual disk performance.

## System/36 Activity Level

The activity level on your System/36 probably has the greatest impact on performance. Since all virtual disk operations are actually done on the System/36, the busier the System/36 is with other processing, the slower virtual disk performance will be.

Under good conditions (the System/36 is not very busy), virtual disk performance can be very similar or even better than the performance you would get using a physical diskette. However, as the System/36 work load increases, virtual disk performance slows down. If virtual disk performance is a problem, you should avoid using the virtual disk at times when the System/36 is the busiest.

You can minimize this problem by assigning the virtual disk or disks you need, and then copying all of the data files you need to a physical diskette or a fixed disk. You can then work with the data directly on your personal computer, without having to wait for the System/36 for each input or output request. When you have finished working with the files, you can copy them all back to the virtual disk in one operation.

## **Virtual Disk Size**

The size of the virtual disks you assign can also impact performance. As a rule, the smaller the virtual disk and the fewer files on the disk, the better the performance will be.

This is because DOS retains the directory and file allocation table for the virtual disks being accessed. Larger virtual disks have larger directories and file allocation tables. In many cases, they may be so large that DOS cannot keep them in storage. Instead, DOS issues input and output requests to read them. (Refer to “Internal Buffers” later in this chapter for more information.)

## **Virtual Disk Performance Compared to Physical Diskette Performance**

Small input and output operations (those involving 3 disk sectors (1536 bytes) or less at one time) can often be faster on a virtual disk than on a physical diskette, because a virtual disk does not require the warm-up time necessary for a physical diskette drive. However, the larger the input and output operations for a virtual disk, the poorer the performance will be compared to physical diskette operation.

## File Arrangement

The arrangement of files on your virtual disk affects the amount of time required to access the virtual disk. This is also true for physical diskettes.

Because space for files is constantly being released and reallocated, DOS may not store all of the data for a particular file in one place. Rather, it can be scattered on a disk; this can affect performance. This often happens on a virtual disk that you have been using for some time.

To correct this problem, you can create a new virtual disk the same size as the old one and copy all the files from the old virtual disk to the new disk. To copy the files, use the following command:

**COPY s:\*. \* d:**

where **s** stands for the drive letter of the old disk, and **d** stands for the drive letter of the new disk.

When you copy the files, the data for each file is stored contiguously. You can then delete the old virtual disk and begin working with the new one.

## Internal Buffers

The number of internal buffers DOS has also affects virtual disk performance. This is true for physical diskettes as well as virtual disks. In general, the more internal buffers DOS has, the fewer actual input and output requests required, and the better performance will be. DOS allows you to specify the number of buffers using the BUFFERS command in the CONFIG.SYS file.

DOS normally uses two or three internal buffers. However, you can increase the number of buffers, depending on the number and size of the virtual disks you have assigned at one time.

*Note: The addition of each buffer decreases the amount of main storage available for other programs by 528 bytes.*

Refer to the *IBM Personal Computer Disk Operating System* manual for more information on how to use the BUFFERS command.

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# Chapter 5. The Virtual Printer Facility

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# Prerequisites

The PC Support/36 router must be running before you can use the virtual printer facility.

The PC Support/36 router called `STARTRTR.EXE` must be run after emulation or after the IBM Token-Ring Network is started. Refer to Chapter 3, "The PC Support/36 Routers," for more information on the PC Support/36 routers.



# Virtual Printer Facility Programs

The virtual printer facility consists of the following programs that are used in addition to the link and the router. These programs are:

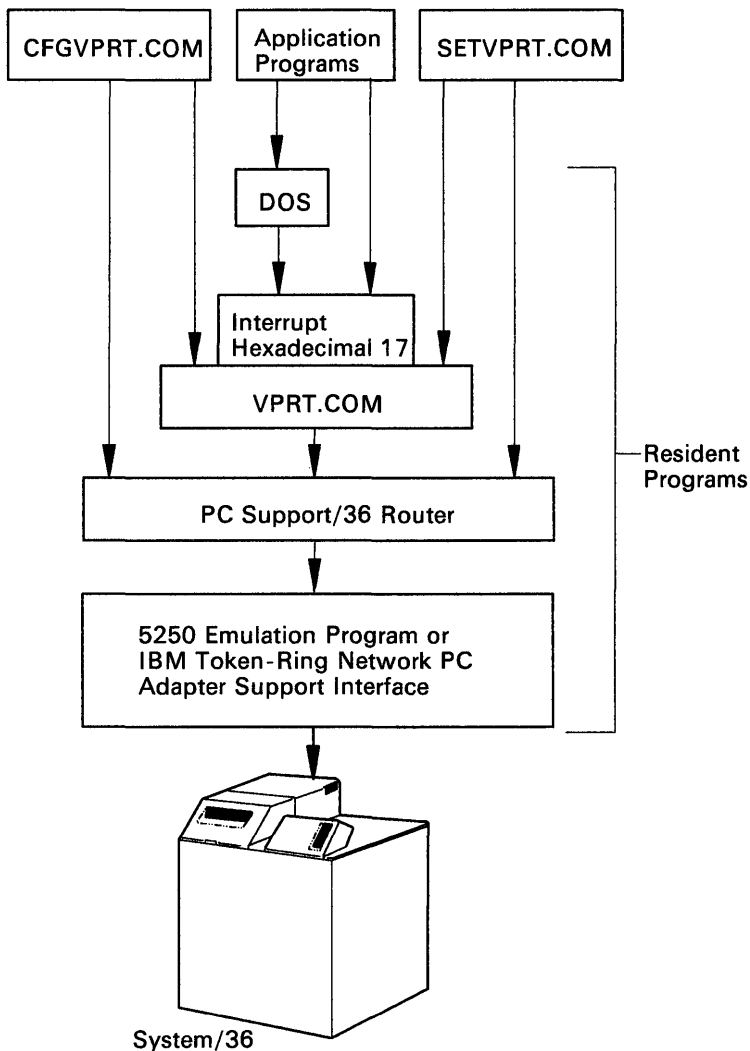
- **VPRT.COM**, which is the virtual printer interrupt handler. This program handles print requests, converts the print stream, as necessary, to System/36 format, and passes the data to the System/36, where it is printed.
- **SETVPRT.COM**, which allows you to interactively assign and release virtual printers.
- **CFGVPRT.COM**, which allows you to automatically assign or release virtual printers using entries in the CONFIG.S36 file or a VPRT setup file. For more information, refer to Chapter 7, "Using the PC Support/36 Virtual Printer Facility," in the *PC Support/36 User's Guide*.

The VPRT.COM program is required to run the other virtual printer facility programs. When you install VPRT.COM, it becomes a resident part of the DOS operating system.

The SETVPRT.COM and CFGVPRT.COM programs allow you to assign and release virtual printers. These programs run as personal computer application programs. However, you must have enough storage left after the link, the router, and the VPRT.COM program are installed to run at least one of these programs. For exact storage requirements, refer to Chapter 1, "Introduction," in the *PC Support/36 User's Guide*.

You are not required to run both SETVPRT.COM and CFGVPRT.COM. For example, if you plan to assign and release the same virtual printers each time you use your personal computer, you need to use only the CFGVPRT.COM program.

The following shows the relationship between the programs required to run the virtual printer facility:



The VPRT.COM program is installed and runs under DOS. The CFGVPRT and SETVPRT programs communicate with the VPRT.COM program (using interrupt hexadecimal 17).

The application programs pass printer operations either to DOS or directly to the Basic Input/Output Service (BIOS). (This is done using interrupt hexadecimal 17.) VPRT.COM then intercepts the print requests.

All of these virtual printer programs communicate directly with the router, which manages communication to the System/36. The interface to the router is through interrupt hexadecimal 68. This interrupt can be changed to another value using the INTL entry in the CONFIG.S36 file. For information on using INTL, refer to Chapter 2, "The PC Support/36 Configuration File."

# **The VPRT.COM Program**

The VPRT.COM program handles all print requests sent to the BIOS using interrupt hexadecimal 17.

When you install VPRT.COM, it becomes a permanently resident part of DOS. This means that VPRT.COM will take up a portion of the storage available in your personal computer to run other programs.

VPRT.COM requires approximately 21K bytes of storage to run. However, this storage requirement is reduced to 13K bytes of DOS resident storage after VPRT.COM is completely installed. An additional 5K bytes of resident storage is required for each virtual printer assigned. (This storage is allocated by the SETVPRT or CFGVPRT program.)

# **The SETVPRT.COM Program**

The SETVPRT.COM program allows you to interactively assign, release, and change virtual printers, and close print files. It also displays the status of any virtual printers currently assigned.

# The CFGVPRT.COM Program

The CFGVPRT.COM program allows you to automatically assign, change, or release virtual printers. The CFGVPRT.COM program assigns and releases virtual printers using VPRT entries in the CONFIG.S36 file or a VPRT setup file. For example:

**[d:]CFGVPRT[VPRT-setup-filename]**

You can use as many VPRT entries as you want in the CONFIG.S36 file or VPRT setup file to assign and release virtual printers. However, the maximum number of virtual printers allowed is three. The following is an example of a CONFIG.S36 file with VPRT entries:

```
SUPPORT/36
VPRT 1
VPRT 2,P3,,,,,5
VPRT 3,P2,,8,88,88
```

If you created this CONFIG.S36 file, the CFGVPRT program would:

- Release printer LPT1, so that data sent to this printer goes to the local personal computer printer.
- Assign printer P3 on the System/36 as virtual printer LPT2. This entry sets the number of copies to five and uses the default for each of the other parameters.
- Assign printer P2 on the System/36 as virtual printer LPT3. This entry sets the lines per inch to 8, the page length to 88 lines, and the lines per page to 88 lines. The number of characters per line is not specified (the default, 80, is assumed).

For details on how to create a CONFIG.S36 file and what to enter, refer to Chapter 2, "The PC Support/36 Configuration File."

When CFGVPRT cannot successfully process an entry in the CONFIG.S36 file or a VPRT setup file, a message will be displayed asking whether you want CFGVPRT to continue processing the remaining entries in the CONFIG.S36 file or VPRT setup file, or to end immediately.

For details on how to specify the VPRT setup file, refer to Chapter 7, "Using the PC Support/36 Virtual Print Facility," in the *PC Support/36 User's Guide*.

## **Batch Error Level Codes Set by CFGVPRT**

If you are running a batch file, CFGVPRT (and VPRT) sets a return code that can be checked by DOS. When all entries are processed successfully, the error level is 0. If an error occurs, but you chose to continue the operation anyway, the error level is set to 10 (hexadecimal 0A). If an unrecoverable error occurs, or you choose to end the CFGVPRT or VPRT program, the error level is set to 20 (hexadecimal 14).

# Creating an AUTOEXEC.BAT File for Virtual Printers

If you frequently use the virtual printer facility, it is recommended that you create an AUTOEXEC.BAT file containing all of the commands required to start the virtual printer facility. This can be especially useful if you usually use the same virtual printers and the same configuration parameters.

The example on the next page shows what the contents of an AUTOEXEC.BAT file might look like and assumes you are using Enhanced 5250 emulation (*rem* means the line is a comment line).

**rem Prompt for the correct date  
rem and time (optional).**

**DATE**

**TIME**

**rem Install the 5250 Emulation Program.**

**rem The parameters P and T are optional:**

**rem P tells the emulation program to skip  
rem the presign-on display and use the PC  
rem keyboard layout.**

**rem T tells the emulation program to skip  
rem 5250 emulation mode after the presign-on  
rem display and go back to the DOS prompt.**

**rem Note: If you have the Enhanced 5250**

**rem Emulation Program or the Remote  
rem 5250 Emulation program, refer to the user's  
rem manual for the correct command or  
rem installation procedure to use.**

**DE5250 P**

**rem Start the PC Support/36 5250 router.**

**rem When the System/36 sign-on display appears,  
rem enter your System/36 user ID and password.**

**STARTRTR**

**rem Install the virtual printer program VPRT.**

**VPRT**

**rem Automatically assign virtual printers using  
rem VPRT entries in the CONFIG.S36 file.**

**CFGVPRT**

In addition to the AUTOEXEC.BAT file, you also need to create a CONFIG.S36 file containing VPRT entries. Refer to Chapter 2, "The PC Support/36 Configuration File," for more information.



# How Virtual Printers Differ from Personal Computer Printers

In most cases, virtual printers function the same way that personal computer printers do. The exceptions are:

- Printer functions are limited in that some personal computer printer commands (such as Double Width Print Mode and Ignore Paper End) cannot be used on a System/36 printer. Also, some personal computer printer commands can be used on one System/36 printer, but not on another.

This means that the virtual printer must simulate some of these printer functions and ignore others. When a personal computer printer function is being simulated, it may not print on the System/36 printer as it does on the personal computer printer. Refer to “Virtual Printer Commands and Configuration Parameters” later in this chapter for more information.

- It is not recommended that you use other personal computer spool utilities while using the virtual printer facility. If another background spool utility is loaded while the VPRT.COM program is loaded, unpredictable results can occur. For more information, refer to “Special Considerations” later in this chapter.

You can use any of the following System/36 printers as a virtual printer:

<b>System/36 Printer</b>	<b>Description</b>
3262	High-speed printer
4214	Medium-speed printer
4224	IPDS printer
4234	Medium-speed matrix printer
4245	Very high-speed printer
5219 or 3812	Letter-quality printer
5224 or 5225	Matrix printer
5256 or 5262	Low-/high-speed printer
5553 or 5557	IGC (Ideographic-capable) printer

# Virtual Printer Commands and Configuration Parameters

This section describes the printer commands and parameters that can be specified for virtual printers. These commands can be performed using a programming language, such as Assembler, that has access to the 8088 registers and can generate interrupt requests.

When you use DOS or a programming language to print data, the print character requests are generated for you. If you want to issue a reset or status request, you must use a programming language that allows you to set the registers and issue interrupts. A printer request is issued with interrupt hexadecimal 17. Refer to the *DOS Technical Reference* manual for details.

Virtual printers support three types of personal computer printer requests. These are:

- **Reset the printer:** This request is the same for a virtual printer as it is for a local personal computer printer. That is, register AH is equal to hexadecimal 01 and register DX is equal to:
  - Hexadecimal 0000 for printer LPT1
  - Hexadecimal 0001 for printer LPT2
  - Hexadecimal 0002 for printer LPT3

When a virtual printer receives a reset request, it closes the existing print file, if any. Values specified in the CONFIG.S36 file or a VPRT setup file, or when you set or changed the virtual printer configuration (SETVPRT), are used until another override command is received and you specify 1 (Yes) for the Command override option.

- **Printer status request:** This request is the same for the virtual printer as it is for a local personal computer printer. That is, register AH is equal to 02 and register DX is equal to:
  - Hexadecimal 0000 for printer LPT1
  - Hexadecimal 0001 for printer LPT2
  - Hexadecimal 0002 for printer LPT3

When the virtual printer receives a Printer Status request, it returns the current virtual printer status in the status byte (register AH). The virtual printer uses the same status as the local personal computer printer, except that information that does not apply to the virtual printer is ignored.

The following table describes the indicators of the printer status byte and their meanings:

<b>Bit</b>	<b>Hex Value</b>	<b>PC Printer Status</b>	<b>Virtual Printer Status</b>
0	01	Time-out	Time-out
1	02	Unused	Unused
2	04	Unused	Unused
3	08	I/O error	I/O error
4	10	Selected	Selected
5	20	Out of paper	Not applicable
6	40	Acknowledge	Not applicable
7	80	Not busy	Not busy

- **Print a character:** This request is the same for a virtual printer as it is for a local personal computer printer. That is, register AH is equal to hexadecimal 00, and register DX is equal to:
  - Hexadecimal 0000 for printer LPT1
  - Hexadecimal 0001 for printer LPT2
  - Hexadecimal 0002 for printer LPT3

The character to be sent to the printer is in register AL. Requests to print a character are made 1 byte at a time. This 1 byte can be a printer character, a printer command, or part of a printer command string. These commands are described in the following section, "Personal Computer Printer Commands."

# Personal Computer Printer Commands

The virtual printer supports many of the personal computer printer commands. However, each type of System/36 printer being used as a virtual printer supports different functions. The virtual printer translates (or simulates) most personal computer printer commands so that they can be accepted on a System/36 printer.

Some personal computer printer commands are ignored by the virtual printer. Such commands are personal computer printer commands that are used only by personal computer printers and have no meaning to some System/36 printers.

The following table shows the personal computer printer commands that are supported by the PC Support/36 virtual printer facility when using the default printer data type, option 2 (Convert PC data to S/36). See Chapter 7, "Using the PC Support/36 Virtual Printer Facility," in the *PC Support/36 User's Guide* for additional information on the printer data type options available. For more information on the personal computer printer commands, refer to the *IBM Personal Computer Guide to Operations*.

<b>PC Printer Code</b>	<b>Hex Value</b>	<b>Function</b>
NUL	00	Null
HT	09	Horizontal Tab
LF	0A	Line Feed
VT	0B	Vertical Tab
FF	0C	Form Feed
CR	0D	Carriage Return
SO	0E	Shift Out (double width)
SI	0F	Shift In (compressed)
DC2	12	Device Control Two (compressed off)
DC4	14	Device Control Four (double width off)
CAN	18	Cancel
ESC -	1B2D	Escape Minus (underline)
ESC 0	1B30	Escape Zero (1/8-inch line feeding)
ESC 2	1B32	Escape Two (starts variable line)
ESC 6	1B36	Escape Six (select character set 2)
ESC 7	1B37	Escape Seven (select character set 1)
ESC B	1B42	Escape B (set vertical tab stop positions)
ESC C	1B43	Escape C (set lines per page or inches per page)
ESC D	1B44	Escape D (set horizontal tab stops)
ESC E	1B45	Escape E (emphasized)
ESC F	1B46	Escape F (emphasized off)

<b>PC Printer Code</b>	<b>Hex Value</b>	<b>Function</b>
ESC G	1B47	Escape G (double strike)
ESC H	1B48	Escape H (double strike off)
ESC N	1B4E	Escape N (set skip perforation)
ESC O	1B4F	Escape O (cancel skip perforation)
ESC W	1B57	Escape W (double width)
ESC o	1B6F	Escape o (end document)
ESC p	1B70	Escape p (begin document)



The following table shows all of the personal computer printer commands that are ignored by the PC Support/36 virtual printer facility when using the default printer data type, option 2 (Convert PC data to S/36). See Chapter 7, "Using the PC Support/36 Virtual Printer Facility," in the *PC Support/36 User's Guide* for additional information on the printer data type options available. For more information on the personal computer printer commands, refer to the *IBM Personal Computer Guide to Operations*.

<b>PC Printer Code</b>	<b>Hex Value</b>	<b>Function</b>
BEL	07	Bell
ESC 1	1B31	Escape One (7/72-inch line feeding)
ESC 3	1B33	Escape Three (variable line feeding to n/216 inch)
ESC 8	1B38	Escape Eight (ignore paper end)
ESC 9	1B39	Escape Nine (cancel ignore paper end)
ESC <	1B3C	Escape Less Than (home head)
ESC A	1B41	Escape A (set variable line feeding to n/72 inch)
ESC J	1B4A	Escape J (set variable line feeding to n/216 inch)
ESC K	1B4B	Escape K (480 bit image graphics mode)
ESC L	1B4C	Escape L (960 bit image graphics mode)
ESC S	1B53	Escape S (subscript/superscript)
ESC T	1B54	Escape T (subscript/superscript off)

<b>PC Printer Code</b>	<b>Hex Value</b>	<b>Function</b>
ESC U	1B55	Escape U (unidirectional printing)
ESC Y	1B59	Escape Y (960 bit image graphics mode normal speed)
ESC Z	1B5A	Escape Z (1920 bit image graphics mode)

The following table shows the personal computer printer commands and the System/36 equivalents (in Printer Data Type 2):

<b>PC Printer Code</b>	<b>PC Printer Function and System/36 Printer Equivalent</b>
NUL	<p><i>PC Printer Function:</i> Used with ESC B and ESC D as a list terminator.</p> <p><i>Virtual Printer Support:</i> Same.</p>
BEL	<p><i>PC Printer Function:</i> Sounds the printer buzzer for 1 second.</p> <p><i>Virtual Printer Support:</i> Ignored.</p>
HT	<p><i>PC Printer Function:</i> Tabs to the next horizontal tab stop. Tab stops are set with ESC D. No tab stops are set when the printer is powered on. (Graphics printer sets a tab stop every eight columns when powered on.)</p> <p><i>Virtual Printer Support:</i> Tab stops are initially set every eight columns. Tab stops may be changed by ESC D.</p>
LF	<p><i>PC Printer Function:</i> Spaces the paper up one line.</p> <p><i>Virtual Printer Support:</i> Same.</p>
VT	<p><i>PC Printer Function:</i> Spaces the paper to the next vertical tab position. Tab stops are set with ESC B.</p> <p><i>Virtual Printer Support:</i> Inserts the proper number of blank lines.</p>
FF	<p><i>PC Printer Function:</i> Advances the paper to the top of the next page.</p> <p><i>Virtual Printer Support:</i> Same.</p>

PC Printer Code	PC Printer Function and System/36 Printer Equivalent
CR	<p><i>PC Printer Function:</i> Moves the printer head to the first position of the same line. (No line feed operation takes place.)</p> <p><i>Note:</i> <i>IBM Personal Computer BASIC adds a line feed unless the command is hexadecimal 8D instead of hexadecimal 0D.</i></p> <p><i>Virtual Printer Support:</i> Same.</p> <p><i>Note:</i> <i>If character set two is specified, hexadecimal 8D is treated as a character instead of a CR command.</i></p>
SO	<p><i>PC Printer Function:</i> Changes the printer to the double width print mode.</p> <p><i>Note:</i> <i>A carriage return, line feed, or DC4 cancels double width print mode.</i></p> <p><i>Virtual Printer Support:</i> System/36 printers do not have this function. Therefore, output is expanded by placing a blank after each character so that the spacing is correct.</p>

<b>PC Printer Code</b>	<b>PC Printer Function and System/36 Printer Equivalent</b>
SI	<p><i>PC Printer Function:</i> Changes the printer to compressed character mode (132 characters per line).</p> <p><i>Virtual Printer Support:</i> System/36 printers do not have this function. It is treated as if you specified 132 characters per line.</p> <p><i>Note:</i> This command will not take effect for the current print file if it is received by the virtual printer support after a printable character, or if you selected 198 for the characters per line parameter.</p>
DC2	<p><i>PC Printer Function:</i> Stops printing in the compressed character print mode.</p> <p><i>Virtual Printer Support:</i> System/36 printers do not have this function. It is treated as if you specified 80 characters per line.</p> <p><i>Note:</i> This command will not take effect for the current print file if it is received by the virtual printer support after a printable character, or if you selected 198 for the characters per line parameter.</p>
DC4	<p><i>PC Printer Function:</i> Stops printing in the double width print mode.</p> <p><i>Virtual Printer Support:</i> Same.</p>

PC Printer Code	PC Printer Function and System/36 Printer Equivalent
CAN	<p><i>PC Printer Function:</i> Clears the printer buffer. Control codes, except shift out, remain in effect.</p> <p><i>Virtual Printer Support:</i> Clears the printer buffer up to the beginning of the current line of printing. Control codes, except shift out, remain in effect.</p>
ESC -	<p><i>PC Printer Function:</i> ESC - followed by a 1, prints all of the following data with an underline. ESC - followed by a 0, cancels the underline print mode.</p> <p>Format: ESC -;1;</p> <p>Format: ESC -;0;</p> <p><i>Virtual Printer Support:</i> Since some System/36 printers do not support this function, the virtual printer facility simulates this function by placing a backspace and an underline character after each character.</p>
ESC 0	<p><i>PC Printer Function:</i> Changes paper feeding to 1/8 inch.</p> <p><i>Virtual Printer Support:</i> Same. For some System/36 printers, you can only change the lines per inch using a switch. In this case, this command is ignored.</p> <p><i>Note:</i> This command will not take effect for the current print file if it is received by the virtual printer support after a printable character.</p>

<b>PC Printer Code</b>	<b>PC Printer Function and System/36 Printer Equivalent</b>
ESC 1	<p><i>PC Printer Function:</i> Changes paper feeding to 7/72 inch.</p> <p><i>Virtual Printer Support:</i> Ignored.</p>
ESC 2	<p><i>PC Printer Function:</i> ESC 2 is an execution command for ESC A. If no ESC A command has been given, line feeding returns to 1/6 inch.</p> <p><i>Virtual Printer Support:</i> Since the virtual printer facility does not support ESC A, the ESC 2 command is ignored if an ESC A has been received since the last RESET printer request. Otherwise, the virtual printer facility sets the line feeding to 1/6-inch for the next System/36 print file.</p> <p>For some System/36 printers, you can only change the lines per inch using a switch. In this case, this command is ignored.</p> <p><i>Note:</i> This command will not take effect for the current print file if it is received by the virtual printer support after a printable character.</p>
ESC 3	<p><i>PC Printer Function:</i> Changes the paper feeding to n/216-inch.</p> <p><i>Virtual Printer Support:</i> Ignored.</p>

PC Printer Code	PC Printer Function and System/36 Printer Equivalent
ESC 6	<p><i>PC Printer Function:</i> Select character set 2.</p> <p><i>Virtual Printer Support:</i> In character set 2, any character between X'20' and X'FF' is treated as a data character and translated to an EBCDIC code according to the translation table you specified.</p>
ESC 7	<p><i>PC Printer Function:</i> Select character set 1.</p> <p><i>Virtual Printer Support:</i> In character set 1, any character between X'00' and X'1F', and between X'80' and X'9F' is treated as a printer command. Other characters are treated as data and translated to an EBCDIC code according to the translation table you specified.</p>
ESC 8	<p><i>PC Printer Function:</i> Ignore paper end.</p> <p><i>Virtual Printer Support:</i> Ignored.</p>
ESC 9	<p><i>PC Printer Function:</i> Cancel ignore paper end.</p> <p><i>Virtual Printer Support:</i> Ignored.</p>
ESC <	<p><i>PC Printer Function:</i> Home head.</p> <p><i>Virtual Printer Support:</i> Ignored.</p>
ESC A	<p><i>PC Printer Function:</i> Set variable line feeding.</p> <p>ESC A sets the line feed feeding to n/72-inch.</p> <p><i>Virtual Printer Support:</i> Ignored.</p>



PC Printer Code	PC Printer Function and System/36 Printer Equivalent
ESC B	<p><i>PC Printer Function:</i> Vertical Tabs.</p> <p>Format: ESC B;n1;n2;...;nk;NUL,</p> <p>where n represents a tab stop position.</p> <p>Sets vertical tab stop positions. Up to 64 vertical stop positions are recognized by the printer. Tab stop numbers must be received in ascending numerical order. The tab stop numbers must be ended by a NUL.</p> <p><i>Virtual Printer Support:</i> Same.</p>
ESC C	<p><i>PC Printer Function:</i> Set lines per page or inches per page.</p> <p>Format (lines): ESC C;n;</p> <p>Sets the page length. The ESC C command must be followed by a value specifying the desired page length. The maximum page (form) length is 127 lines.</p> <p>Format (inches): ESC C;n;m;</p> <p>Sets the length of the page in inches. You must specify a value of 00 for n, and a value between 1 and 22 inches for m.</p> <p><i>Virtual Printer Support:</i> Same.</p> <p><i>Note:</i> The command will not take effect for the current print file if it is received by the virtual printer support after a printable character.</p>

<b>PC Printer Code</b>	<b>PC Printer Function and System/36 Printer Equivalent</b>
ESC D	<p><i>PC Printer Function:</i> Set horizontal tab stops.</p> <p>Format: ESC D;n1;n2;...;nk;NUL;</p> <p>Sets the horizontal tab stop positions. The maximum number of tab stops that can be set is 112.</p> <p><i>Virtual Printer Support:</i> Same.</p>
ESC E	<p><i>PC Printer Function:</i> Changes the printer to the emphasized print mode.</p> <p><i>Virtual Printer Support:</i> System/36 printers do not have this function. Instead, the double strike function is performed.</p>
ESC F	<p><i>PC Printer Function:</i> Stops printing in the emphasized print mode.</p> <p><i>Virtual Printer Support:</i> Same.</p>
ESC G	<p><i>PC Printer Function:</i> Changes the printer to double strike print mode.</p> <p><i>Virtual Printer Support:</i> Same.</p>
ESC H	<p><i>PC Printer Function:</i> Stops printing in the double strike print mode.</p> <p><i>Virtual Printer Support:</i> Same.</p>

PC Printer Code	PC Printer Function and System/36 Printer Equivalent
ESC J	<p><i>PC Printer Function:</i> Changes paper feeding to n/216-inch.</p> <p><i>Virtual Printer Support:</i> Ignored.</p>
ESC K	<p><i>PC Printer Function:</i> 480 bit image graphics mode.</p> <p>Changes from the text mode to the 480 bit image graphics mode.</p> <p><i>Virtual Printer Support:</i> Ignored.</p> <p><i>Note:</i> Because the virtual printer ignores this command, if this command is included in your print data stream, the line spacing will not be the same as if you had printed it on the personal computer graphics printer.</p>
ESC L	<p><i>PC Printer Function:</i> 960 Bit image graphics mode.</p> <p>Changes from the text mode to the 960 bit image graphics mode.</p> <p><i>Virtual Printer Support:</i> Ignored.</p> <p><i>Note:</i> Because the virtual printer ignores this command, if this command is included in your print data stream, the line spacing will not be the same as if you had printed it on the personal computer graphics printer.</p>

PC Printer Code	PC Printer Function and System/36 Printer Equivalent
ESC N	<p><i>PC Printer Function:</i> Set skip perforation.</p> <p>Format: ESC N;n;</p> <p>Sets the skip perforation function. The number following ESC N sets the value for the number of lines of skip perforation. The value of n must be between 1 and 127. ESC N must be specified any time the page length (ESC C) is changed.</p> <p><i>Virtual Printer Support:</i> Same.</p> <p><i>Note:</i> This command will not take effect for the current print file if it is received by the virtual printer support after a printable character.</p>
ESC O	<p><i>PC Printer Function:</i> Cancels the skip perforation function.</p> <p><i>Virtual Printer Support:</i> Same.</p>
ESC S	<p><i>PC Printer Function:</i> Subscript/superscript</p> <p>Changes the printer to the subscript or superscript print mode.</p> <p><i>Virtual Printer Support:</i> Ignored.</p>
ESC T	<p><i>PC Printer Function:</i> The printer stops printing in the subscript or superscript print mode.</p> <p><i>Virtual Printer Support:</i> PDT 3 and 4 support superscripts and subscripts.</p>

<b>PC Printer Code</b>	<b>PC Printer Function and System/36 Printer Equivalent</b>
ESC U	<p><i>PC Printer Function:</i> Unidirectional printing. The printer prints from left to right following the input of ESC U;1. This operation is canceled when ESC U;0 is received.</p> <p><i>Virtual Printer Support:</i> Ignored.</p>
ESC W	<p><i>PC Printer Function:</i></p> <p>Format: ESC W;1;</p> <p>Changes the printer to the double width mode. This mode is not canceled by a line feed operation and must be canceled with ESC W followed by a 0 (zero).</p> <p>Format: ESC W;0;</p> <p>Cancels the double width print mode.</p> <p><i>Virtual Printer Support:</i> System/36 printers do not have this function. Therefore, the output is expanded by placing a blank after each character so that the line spaces correctly.</p>

PC Printer Code	PC Printer Function and System/36 Printer Equivalent
ESC Y	<p><i>PC Printer Function:</i> 960 bit image graphics mode normal speed.</p> <p>Changes from the text mode to the 960 bit image graphics mode.</p> <p><i>Virtual Printer Support:</i> Ignored.</p> <p><i>Note:</i> Because the virtual printer ignores this command, if this command is included in your print data stream, the line spacing will not be the same as if you had printed it on the personal computer graphics printer.</p>
ESC Z	<p><i>PC Printer Function:</i> 1920 bit image graphics mode.</p> <p>Changes from the text mode to the 1920 bit image graphics mode.</p> <p><i>Virtual Printer Support:</i> Ignored.</p> <p><i>Note:</i> Because the virtual printer ignores this command, if this command is included in your print data stream, the line spacing will not be the same as if you had printed it on the personal computer graphics printer.</p>

<b>PC Printer Code</b>	<b>PC Printer Function and System/36 Printer Equivalent</b>
ESC o	<p><i>PC Printer Function:</i> End Document. Most personal computer printers do not use this function. This function is intended primarily for the 5218 Printer. It tells the printer that the time-out function, which was previously disabled by a Begin Document (ESC p) command, must be enabled.</p> <p><i>Virtual Printer Function:</i> Closes the current print file. It also enables the printer time-out function previously disabled by a Begin Document (ESC p) command.</p>

<b>PC Printer Code</b>	<b>PC Printer Function and System/36 Printer Equivalent</b>
ESC p	<p data-bbox="348 152 894 428"><i>PC Printer Function:</i> Begin Document. Most personal computer printers do not use this function. This function is intended primarily for the 5218 Printer. It tells the printer that the time-out function must be temporarily disabled until an End Document (ESC o) command is received.</p> <p data-bbox="348 461 905 672"><i>Virtual Printer Function:</i> Closes the current print file (if any). If the time-out function is enabled, this command temporarily disables the printer time-out function until an End Document (ESC o) or reset printer command is received.</p> <p data-bbox="348 704 898 915">The time-out value is enabled by running the SETVPRT or CFGVPRT program and specifying a time-out value other than zero. After you use SETVPRT or CFGVPRT to reassign a virtual printer, the time-out function will be enabled.</p>



# Virtual Printer Translation Table

The default PC Support/36 ASCII to EBCDIC translation table is used by the virtual printer unless you create a new table to be used instead. To create a new translation table or change the values in the default table, you can use the translation table utility. (Refer to Chapter 7, "The Translation Table Utility.")

The translation table entries between hexadecimal 00 and hexadecimal 1F are not valid for the virtual printer, although the translation table utility allows you to use these entries. If these entries are used, the virtual printer ignores them. ASCII values from hexadecimal 00 to hexadecimal 1F for both the first and second printer hexadecimal character sets, and values from hexadecimal 80 to hexadecimal 9F for the first hexadecimal character set, are reserved for printer commands.

The EBCDIC values from hexadecimal 00 to hexadecimal 3F are reserved for printer commands. You should not specify these values in your virtual printer translation table. If you do, a warning message is displayed for each invalid entry in the translation table you specified when loading the VPRT.COM program. You can ignore this message and continue by pressing the Enter key.

However, if you ignore invalid entries and use an ASCII character that translates to an invalid entry in the table specified for the virtual printer, the invalid entry is replaced by the character to be used as the replacement character for untranslatable characters. You specified this replacement character using SETVPRT or CFGVPRT when you assigned or changed the virtual printer. (The default is a blank.)

The VPRT.COM program continues. The DOS return code will be 0 if VPRT.COM is part of your batch file and there is no other error detected by VPRT.COM.

You can press the Escape key to end the VPRT.COM program. If you do so, you can then use the translation table utility to update your translation table and run the VPRT.COM program again.

## Special Considerations

When using the virtual printer facility, you should be aware of the special considerations in this section.

### Use of Remote Printers

If you want to use a remote printer, the printer must be *varied on* so that the system will recognize that the printer exists.

### Use of Page Length and Lines Per Page

The Lines per page and the Page length parameters are used by the SETVPRT and CFGVPRT programs to determine when page ejects (or form feeds) are inserted into the virtual print stream. If the value specified for the Lines per page parameter is less than the value specified for the Page length parameter, the virtual printer detects when the specified number of lines have been printed on a page and causes the System/36 printer to perform a page eject.

However, if your print data contains the commands needed to perform the page breaks correctly, the virtual printer may cause extra form feeds to be done. This will result in blank pages scattered throughout the printed output.

If your print stream is already formatted (it prints correctly on your local personal computer printer), you should ensure that the values specified for the Lines per page and Page length parameters are equal when you assign a virtual printer. This will prevent the virtual printer from inserting any extra form feeds, and will ensure that the page breaks done by the System/36 printer are the same as those done by your personal computer printer (assuming that the forms being used on the System/36 printer are the same length as those being used on the personal computer printer).

If you print data that is not already formatted to produce page breaks, specifying a value for Lines per page that is less than the value specified for Page length allows the virtual printer to skip the specified number of lines across the page breaks. The number of lines skipped is the difference between the page length and the number of lines per page.

# Using Personal Computer Print Spoolers and Other Timer-Driven Programs

Some personal computer programs support print spooling to the personal computer printer. It is recommended that you do not use these spoolers with data that is being sent to a virtual printer, because these spoolers use interrupt hexadecimal 17, just as the virtual printer facility does. Depending on how the print spooler is installed, the virtual printer facility may never intercept the data intended for a virtual printer.

These print spoolers often send print data to the personal computer printer while running on the hardware timer interrupt. This type of program should not be used with the PC Support/36 virtual printer facility.

# **Opening and Closing Virtual Print Files**

It is important to understand when virtual print files are opened and closed.

## **Opening a Virtual Print File**

A new virtual print file is opened when a character of printable data is sent to a printer that has just been assigned for the first time as a virtual printer by the CFGVPRT or SETVPRT program, or is already assigned as a virtual printer but has just closed a previous virtual print file. This means that, if you assign a virtual printer but never send any data to it, a print file is never opened.

## **Closing a Virtual Print File**

Controlling when a virtual print file is closed is an important part of using the virtual printer facility. If you are printing several jobs, but the print files are not closed correctly, the printed output may not appear as you want it. For example, it may contain partial data from several jobs, or the printed output from a single job may be spread over several print files.

If a print file is never closed, it may not be printed at all or, if it is, part of the print data might be missing.

The PC Support/36 virtual printer facility uses a time-out value to automatically close virtual print files. The time-out value is automatically set for you when you assign a virtual printer using the SETVPRT or CFGVPRT program. Once a print file is opened, the time-out value specifies the length of time the file should remain open since the last print data was sent to the virtual printer. After the specified period of time, the print file is automatically closed.

The default value is 10 seconds. However, you can change this value to a number from 1 through 255 seconds using the CFGVPRT or SETVPRT advanced options.

You can also disable the time-out by specifying a time-out value of zero. If you do this, you must ensure that the print files are closed. You can close a print file in one of the following ways:

- Using the close option of the SETVPRT program. You can use option 3 on the OPTIONS menu to display or close virtual print files that are open. When closed, the print file is immediately sent to the specified printer for printing.
- Releasing a virtual printer. When you release a virtual printer using the SETVPRT or CFGVPRT programs, the open print file is automatically closed and printed on the specified printer.
- Sending a RESET command to the virtual printer. Refer to “Virtual Printer Commands and Configuration Parameters” earlier in this chapter for information on how to send a RESET command from a personal computer program.

- Sending a Begin Document or End Document command to a virtual printer. If your application program is slow when sending printer data to the virtual printer, it is recommended that you do one of the following:
  - Disable the time-out by running the SETVPRT or CFGVPRT program. Add an End Document command to the end of your print data to cause the print file to be closed at the correct time.
  - Add a Begin Document command to the beginning of your print data to cause the time-out to be temporarily disabled. Add an End Document command to the end of your print data to cause the current print file to be closed and enable the time-out, which was temporarily disabled when the Begin Document command was received.

If you are running the SETVPRT or the CFGVPRT programs, you should be aware that, even though the time-out period expires, the final buffer of data will not be sent to the virtual printer until the SETVPRT or CFGVPRT program ends.

When the time-out value is used, the virtual printer intercepts the hardware interrupt hexadecimal 1C to mark a particular print file as closed. However, the print file cannot be sent to the virtual printer because the printer cannot spend more than a fraction of a second on the hardware timer interrupt. This means that, although the print file is marked as closed, the last buffer of print data is not sent until the virtual printer gains control again.

This is usually done when another character is sent to the printer, which opens another print file on the personal computer and sends the previously closed print file to the System/36. If a print file is closed using a time-out value and no more data is sent to the printer, the virtual printer facility may not regain control and the last part of the print file will not be sent to the System/36.

To prevent this problem, the virtual printer facility also intercepts the keyboard interrupt (hexadecimal 16). Any program that uses this interrupt will cause the virtual printer facility to regain control and, if necessary, send the last part of a print file to the System/36. This interrupt is constantly checked by DOS to determine if you have typed anything. However, this interrupt is not constantly checked by some programs, such as BASIC, preventing the virtual printer facility from regaining control and sending the remaining print file to the System/36.

This means that, if you are not at a DOS prompt, and have been waiting for a virtual print file to close after the time period specified in the time-out value, you may have to press a key on the keyboard or return to the DOS prompt before the print file is actually sent to the System/36.

Once a print file is closed for a virtual printer, the next printable character sent to that printer will open a new print file. With a few exceptions, this new print file will have the same characteristics as the previous print file.



# Changing Characteristics of a Print File

You can change some characteristics of a print file while printing on a locally attached personal computer printer that cannot be changed while printing on a virtual printer. These characteristics are:

- Characters per line
- Lines per inch
- Lines per page
- Page length

For a virtual print file, the values for these characteristics must be set using the SETVPRT and CFGVPRT programs when the virtual printer is assigned. However, these values can be overridden for a program if both of the following are true:

- Command override is in effect for the virtual printer. Command override is set up using the SETVPRT or CFGVPRT advanced options when a virtual printer is assigned. (The default for command override is no.)

- The override commands are sent to the printer before any printable characters are sent. This means that, even if you specify yes for the Command override parameter, once printable data is sent to the virtual printer, you cannot change the characteristics.

*Note: If you selected 198 for the Characters per line parameter, the compress on and compress off commands will be ignored by the virtual printer facility even though the command override option is selected and the compress commands are sent to the virtual printer before the first printable character is sent.*

Using printer commands to change these characteristics affects only the current print file. The next print file opened for that printer will use the original values set by SETVPRT or CFGVPRT, unless you override them again by sending printer commands before the printable data.

*Note: Using printer commands to change the characteristics of a print file does not affect the values displayed by the SETVPRT and CFGVPRT programs.*

## To the DisplayWrite User

If you include a KQE.COM (Keyboard Queue Extender) in your DisplayWrite batch file (DW1.BAT, DW2.BAT or DW3.BAT), you must run DWx.BAT (where x is 1, 2, or 3) and exit, or run KQE.COM before loading VPRT.COM. If you do so, your print files will be closed properly; otherwise, you must exit the DisplayWrite program in order to cause your print files to be closed properly.

If you use a default time-out (10 seconds), the time may not be long enough for the DisplayWrite program to accumulate printing data. Therefore, one DisplayWrite print form will become multiple System/36 print files. To prevent this from occurring, you need to increase or disable the time-out value.

# **Sending Personal Computer Data to a Personal Computer Printer**

If you are sending personal computer printer data to a personal computer printer that is emulating a System/36 printer through the virtual printer facility and the 5250 emulation printer program, or the Work Station Feature program, it is recommended that you do the following:

## **1. Using SETVPRT**

- Select option 5 (Set printer data type) on the **ADVANCED OPTIONS** menu of the virtual printer facility and press the Enter key. The printer data type display will appear.
- Select option 4 (PC printer data) on the printer data type display and press the Enter key to set the printer data type.

## **2. Using CFGVPRT**

Select option 4 (PC printer data) on the printer data type display and press the Enter key to set the printer data type.

The use of the PC printer data option for printer data type assures that the features of the personal computer printer are fully utilized. No data conversion is done by the virtual printer facility and the emulation program, or Work Station Feature.

For more information on setting printer data type, refer to Chapter 7, "Using the PC Support/36 Virtual Printer Facility," in the *PC Support/36 User's Guide*.



# Chapter 6. The Transfer Facility

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# Overview

The transfer facility consists of the following programs:

STF.COM  
RTOPC.EXE  
RTOPCB.EXE  
RFROMPC.EXE  
RFROMPCB.EXE

The STF.COM (source transfer facility) program communicates to the System/36 through the router. STF.COM is a programming interface that allows personal computer application programs to send data to and receive data from the System/36. STF.COM also manages requests from all of the other transfer facility programs.

If you are using 5250 emulation, the 5250 Emulation Program, the router, and STF.COM must all be running in order for you to use any of the other transfer facility programs.

If you are using the IBM Token-Ring Network, the IBM Token-Ring Adapter Support Interface (TOKREUI.COM), the router, and STF.COM must be running in order for you to use any of the other transfer facility programs.

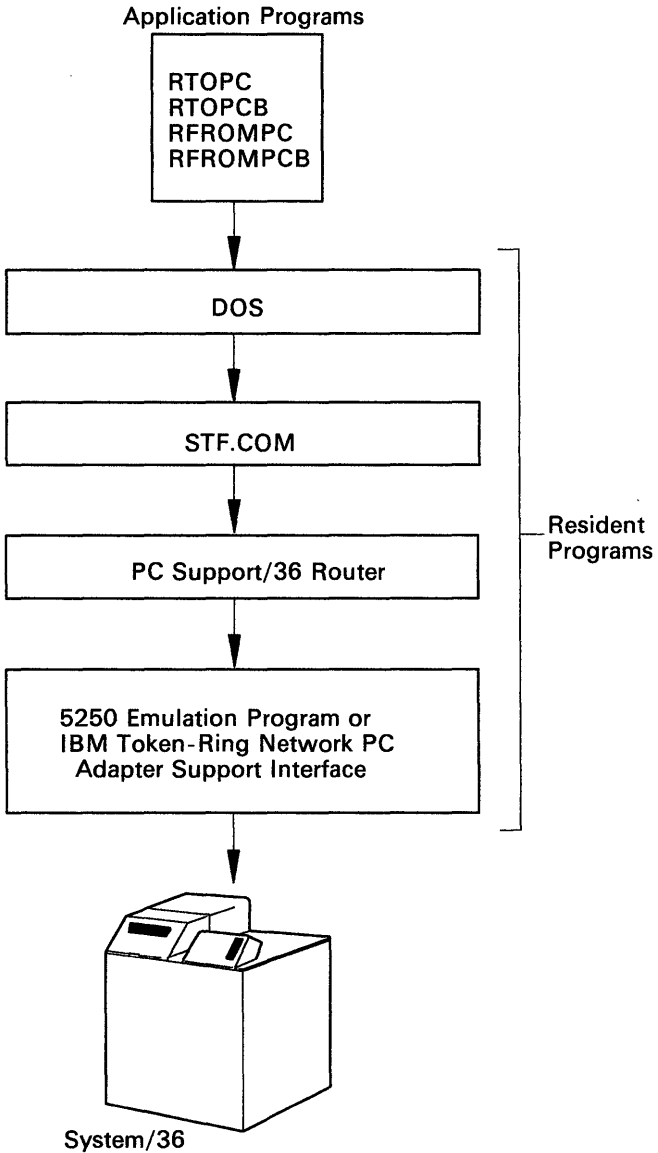
The other transfer facility programs, RTOPC, RTOPCB, RFROMPC, and RFROMPCB, are application programs that use the PC Support/36 application program interface through STF.COM to communicate with the System/36. These programs provide the means to interactively or automatically transfer data to and from the System/36.

The programs RTOPC and RFROMPC are the interactive transfer facility programs. They provide a series of prompts to step you through creating a System/36-to-personal computer or personal computer-to-System/36 transfer request.

These programs use DOS function calls to receive keyboard input. This means that you can use DOS redirected input from a disk file as input to these programs. Refer to the *IBM Personal Computer Disk Operating System* manual for more information about DOS redirected input and output.

The programs RTOPCB and RFROMPCB are automatic transfer facility programs. They automatically run a transfer request that you have created using the interactive transfer facility programs.

The following diagram shows the relationship between the transfer facility programs:



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Instead of using the IBM-supplied transfer facility programs RTOPC, RTOPCB, RFROMPC, and RFROMPCB, you can write your own application program to transfer data to and from the System/36. Your program must use the application program interface provided through STF.COM to communicate with the System/36. Refer to “Application Program Interface” later in this chapter for details.

# Default Transfer Facility Batch Files

Four IBM-supplied batch files are provided with the transfer facility portion of PC Support/36. These batch files automatically start the router and STF.COM. These batch files and their contents are:

- TOPC.BAT, which contains:

```
STARTRTR.EXE
STF.COM
RTOPC.EXE %1
```

- TOPCB.BAT, which contains:

```
STARTRTR.EXE
STF.COM
RTOPCB.EXE %1
```

- FROMPC.BAT, which contains:

```
STARTRTR.EXE
STF.COM
RFROMPC.EXE %1
```

- FROMPCB.BAT, which contains:

```
STARTRTR.EXE
STF.COM
RFROMPCB.EXE %1
```

You can also write your own batch files to run these programs.

# How to Write Batch Files for the Transfer Facility

You can include the transfer facility programs in your own batch files. In order to do this, you must understand the sequence in which those programs must be started. You must also know how to check the return codes that these programs return.

## Prerequisite Programs

In order to run the transfer facility programs, you must do the following:

1. 5250 Emulation or IBM Token-Ring Network must be started before you can run any of the PC Support/36 programs. It is recommended that you start 5250 Emulation or IBM Token-Ring Network in your AUTOEXEC.BAT file. If you do not have an AUTOEXEC.BAT file, 5250 Emulation or IBM Token Ring Network can be added to the LINK36.BAT file at installation. For information on how to do this, refer to Chapter 1, "Installation."
2. Start the router. The router must be running in order for any of the other PC Support/36 programs to be able to communicate with the System/36. For more information on the router, refer to Chapter 3, "The PC Support/36 Routers."

Once these two programs are running, you can start one or more of the desired transfer facility programs.

## Starting STF.COM

The source transfer facility program (STF.COM) must be running before any of the transfer facility programs can be used. Before you start STF.COM, you must load the prerequisite programs. Refer to "Prerequisite Programs" earlier in this chapter for more information.

After you have started the prerequisite programs, you can start STF.COM in either of the following two ways:

- Automatically, by typing in one of the following transfer facility commands:

TOPC  
FROMPC  
TOPCB  
FROMPCB

- By typing the following command after the DOS prompt:

**STF [X]**

where:

**X** is an optional parameter specified by the user to indicate the maximum number of transfer requests that are to be opened simultaneously. This number can range from one to eight. If no parameter is specified, the default is one. This parameter is provided for a programmer who writes his own application program and needs more than one transfer request active at a time. Also, the storage requirements for STF.COM will vary depending upon this parameter.

The source transfer facility program requires 20K bytes of storage if the maximum number of transfer requests is one. For each additional transfer request beyond one, an additional 3.3K bytes of storage is needed.

When STF.COM is started, it first determines if the router is loaded. If the router is not loaded, STF.COM displays an error message and ends immediately.

If the router is loaded, STF.COM determines at which interrupt level to install itself. If the message facility has already been installed, STF will ignore any PCSI entries in the PC Support/36 configuration file (CONFIG.S36) and will install itself at the same interrupt level as the message facility. Otherwise, STF processes the PCSI entries in the configuration file to determine at which interrupt to install. If the specified interrupt is the same as the interrupt at which the router is installed, STF ends and an error message is displayed. If there is no PCSI entry, STF will attempt to install at interrupt hexadecimal 69, the default. If it is possible that the router is using this interrupt level, then STF will end and display an error message.

- If STF.COM is *not* already in storage, STF.COM searches the current directory on the default drive for the PC Support/36 configuration file (CONFIG.S36). If the configuration file exists, STF.COM searches for both A2ET and E2AT entries which indicate which ASCII-to-EBCDIC and EBCDIC-to-ASCII translation tables are to be loaded over the default translation tables. If neither A2ET nor E2AT entries are found, the default translation tables in STF.COM are used.



For details on how to specify these entries, refer to Chapter 2, "The PC Support/36 Configuration File." For information on the errors that may occur when processing these table entries, refer to the *PC Support/36 Messages Guide*. If no severe errors occur, STF.COM ends and becomes a resident part of DOS.

- If STF.COM is already in storage and is the same version, STF.COM is set to the initial stage and remains the active program to handle transfer requests that are sent to it. Setting STF.COM to its initial stage closes any active transfer requests, and the router conversations handling those requests are deactivated.

Any translation tables specified in the configuration file will be loaded over the translation tables already loaded into storage. If a configuration file does not exist, or if there are no A2ET and no E2AT entries in the configuration file, the default translation tables will be loaded over the translation tables in the active source transfer facility program. This is one way to reload the default translation tables.

If the parameter used to specify the maximum number of transfer requests is greater than the maximum number of transfer requests currently allowed, additional storage is allocated for each additional transfer request.

- If an older version of STF.COM is loaded into storage, the source transfer facility program loads itself into storage and this newer version becomes the active program that will handle the transfer requests sent to it. The old version of STF.COM still exists in storage, but it is inactive.

Any A2ET and E2AT entries specified in the configuration file will be processed. The specified translation tables will be loaded over the default translation tables in the new version of STF.COM. If the configuration file does not exist or if it does not contain A2ET or E2AT entries, the default translation tables will be used. This new version of STF.COM will end and become a resident part of DOS.

- If a new version of STF.COM already exists in storage, and an older version of STF.COM is started, the program that is started will display an error message and end immediately. The source transfer facility program that already exists in storage will remain active.

The A2ET and E2AT entries in the configuration file are not processed and the default translation tables are not loaded over the existing translation tables.

## **Starting the Transfer Facility Programs**

After you have started STF.COM, you can run the RTOPC, RTOPCB, RFROMPC, and RFROMPCB programs, as well as your own application program.

You can specify parameters on each of the four IBM-supplied transfer facility programs. You would specify these parameters the same way they are specified for their corresponding IBM-supplied batch files. Refer to the *PC Support/36 User's Guide* for details on the parameters you can specify for these programs.

## **Removing STF.COM**

You may want to free the personal computer memory used by STF.COM when you have finished running an application program that interfaces to the source transfer facility. For example, the transfer facility programs. This gives you more memory to run other applications.

To accomplish this, type the following command after the DOS prompt:

```
STF /R
```

STF.COM will attempt to remove itself from memory. If the version and modification level of the installed source transfer facility is not the same as the STF.COM program you ran with the /R parameter, an error message will be displayed.

## **Error Level Return Codes**

The router, RTOPCB.EXE, STF.COM, and RFROMPCB.EXE programs set the DOS error level to indicate whether processing was successful, partially successful, or unsuccessful. This error level can be checked from a batch file to determine what processing should be done next.

The following are the expected error return codes and their meaning:

<b>Error Level (Decimal)</b>	<b>Description</b>
0	Processing was successful.
10	Processing was partially successful. An error or a warning occurred, but the program was able to complete its task.
20	Processing was unsuccessful. An error occurred and the program terminated abnormally.

## Batch File Example

The example on the next page shows how you might write a batch file to run various transfer facility programs. For this example, assume that emulation has been started, and that the transfer requests were previously created and saved using the interactive System/36-to-personal computer transfer facility. (For details on how to create and save transfer requests, refer to Chapter 9, "Transferring Data from the System/36 to the Personal Computer," and Chapter 10, "Transferring Data from the Personal Computer to the System/36," in the *PC Support/36 User's Guide*.)

The batch file in this example runs four System/36-to-personal computer transfer requests: CUST01.TTO, CUST02.TTO, CUST03.TTO, and CUST04.TTO. If any transfer request is unsuccessful, a message is displayed and the batch file ends.

```
ECHO OFF  
STARTRTR.EXE  
STF.COM  
RTOPCB.EXE CUST01.TTO  
IF ERRORLEVEL 20 GOTO EXIT1  
RTOPCB.EXE CUST02.TTO  
IF ERRORLEVEL 20 GOTO EXIT2  
RTOPCB.EXE CUST03.TTO  
IF ERRORLEVEL 20 GOTO EXIT3  
RTOPCB.EXE CUST04.TTO  
IF NOT ERRORLEVEL 20 GOTO EXIT  
GOTO EXIT4  
:EXIT1  
ECHO CUST01 DID NOT WORK  
GOTO EXIT  
:EXIT2  
ECHO CUST02 DID NOT WORK  
GOTO EXIT  
:EXIT3  
ECHO CUST03 DID NOT WORK  
GOTO EXIT  
:EXIT4  
ECHO CUST04 DID NOT WORK  
:EXIT
```

# Personal Computer File Description File

The file description file is a personal computer file that is used to describe the data in a corresponding personal computer file. This file description is only required when you are transferring data to a file on the System/36 that was defined by IDDU data definitions.

Just as the System/36 files require data definitions, so do the personal computer files to be transferred. However, the System/36 data definitions describe the file as it exists on the System/36, and the personal computer file description file describes the same data as it exists on the personal computer.

The file description file contains a description for each field in a data file. This description includes the field name, data type, and the field size. The file description file also contains the type of personal computer file in which the data is stored.

A file description file can be automatically created for you when you transfer data from the System/36 to the personal computer. However, if you have data that you want to transfer to the System/36 that has not been previously transferred from the System/36 to the personal computer, you must create a file description file.

# Creating a File Description File

You can create a file description file using a personal computer text editor, such as the Personal Editor. The file description file must be an ASCII text file, and each record must end with a carriage return character, CR (hexadecimal 0D), and a line feed character, LF (hexadecimal 0A). Tab characters (hexadecimal 09) are treated as ASCII blanks. The last byte of the file must contain an end-of-file character, EOF (hexadecimal 1A). Your text editor probably already uses these characters.

You can use either uppercase or lowercase characters anywhere in the file.

## File Description File Format

The format of the file description file is as follows:

```
PCFDF [comment]
PCFT file-type-indicator [comment]
PCFL field-name-1 data-type-1
    length-1[/decimal-position-1][comment]
    .
    .
    .
PCFL field-name-n data-type-n
    length-n[/decimal-position-n][comment]
[* comment]
```

where items within brackets ([ ]) are optional.

**PCFDF** identifies this file as a personal computer file description file. This entry must appear in the first line of the file, starting in column one. A comment entry is the only other entry that is allowed on the first line. If you type in a comment, it must be separated from the PCFDF keyword by a blank.



**PCFT** identifies the type of personal computer file in which the data is stored. This entry must appear only once, must start in column one, after the PCFDF record, and before any PCFL records.

The PCFT entry contains the following:

- The keyword, PCFT, followed by a blank
- The indicator for the type of personal computer file

The following chart shows the valid personal computer file type indicators:

<b>Indicator</b>	<b>File Type</b>
1	ASCII text
2	DOS RANDOM
3	BASIC SEQUENTIAL
4	BASIC RANDOM
5	DIF <sup>1</sup>
6	No Conversion file
<sup>1</sup> DIF is a registered trademark of Lotus Development Corporation.	

- A comment. This is an optional entry for your information only. If you type a comment, it must be separated from the personal computer file type indicator by a blank.

The following is an example of a PCFT entry:

#### **PCFT 4 BASIC RANDOM FILE**

**PCFL** identifies a definition for a field. You must enter a PCFL entry in the file description file for each field in the personal computer data file. The PCFL records must be in the same order as the fields they define in the data file.

You can define as many as 60 PCFL records in the file description file. Remember, you must start PCFL records in column one. If you enter more than 60 PCFL records, you will receive an error message. A record cannot be continued on more than one line, and only the first 80 characters of a record are used.

Each PCFL entry contains the following:

- The keyword, PCFL, starting in column one and followed by a blank. This identifies the record as a field description.
- The field name, followed by a blank. This name must match the name that exists in the System/36 data definitions. The field name can be from 1 to 8 characters long.

- The indicator for the data type. The chart below shows the indicator that represents the personal computer data type of the data that exists in the field. This indicator must be followed by a blank. You must specify one of the following:

<b>Indicator</b>	<b>Data Type</b>
1	ASCII
2	ASCII numeric
3	Hexadecimal
4	Binary
5	ASCII-zoned decimal
6	ASCII-packed decimal
7	BASIC integer
8	BASIC single-precision floating point
9	BASIC double-precision floating point
10	EBCDIC
11	EBCDIC-zoned decimal
12	EBCDIC-packed decimal

The data type indicator you enter must be valid for the file type you entered earlier.

Valid data types for each file are:

<b>File Type</b>	<b>Valid Data Types</b>
ASCII text	ASCII, ASCII numeric
DOS random	ASCII, binary, hexadecimal, ASCII-packed decimal, ASCII-zoned decimal
BASIC sequential	ASCII, ASCII numeric
BASIC random	ASCII, hexadecimal, BASIC integer, BASIC single-precision floating point, BASIC double-precision floating point
DIF	ASCII, ASCII numeric
No conversion	EBCDIC, EBCDIC-zoned decimal, EBCDIC-packed decimal, binary, hexadecimal

- The size of the field as it is stored in the personal computer file. This is the size in bytes of the data in the field.

For numeric data in BASIC sequential and DIF files, a size specification must be present. However, because the data in these fields is of variable length, the transfer facility will assume a maximum length of 65 characters. This length more than covers the largest possible exponential ASCII numeric value. The size specifications for character fields must be the maximum size of any data item in that field.

The allowed personal computer data length limits for each data type are shown in the following chart. These are the maximum lengths that can be specified for the size in the PCFL entry.

<b>Personal Computer Data Type</b>	<b>Data Length Limits</b>
ASCII	4096
ASCII numeric	33 (except for DIF and BASIC sequential)
Hexadecimal	256
Binary	4
Zoned decimal (ASCII and EBCDIC)	31
Packed decimal (ASCII and EBCDIC)	16
BASIC integer	2 (only allowed length)
BASIC single-precision	4 (only allowed length)
BASIC double-precision	8 (only allowed length)
EBCDIC	4096

The allowed System/36 data length limits for each data type are:

<b>System/36 Data Type</b>	<b>Data Length Limits</b>
EBCDIC	256
Hexadecimal	256
Binary	2 or 4 (only allowed lengths)
Zoned decimal (EBCDIC)	15
Packed decimal (EBCDIC)	8

*Note: The data length limits for the personal computer and the System/36 data fields are different in some cases. For these cases, the transfer facility will attempt to fit the personal computer data into the System/36 field. If the personal computer data will not fit into the System/36 field, a message will be displayed. Refer to "Data Conversions" in this chapter for more details.*

- A slash (/) followed by the number of decimal positions in the field. This is an optional entry. If the number has decimal positions, enter the number of decimal digits to the right of the decimal point.

This entry can only be specified if the data type is one of the following:

- Binary
- ASCII-zoned decimal
- ASCII-packed decimal
- EBCDIC-zoned decimal
- EBCDIC-packed decimal
- ASCII numeric

The value you specify in this PCFL entry can be from zero to the maximum number of decimal digits in this number.

*Note: The number of decimal positions that can be in a System/36 field ranges from zero to nine or the maximum number of decimal digits in this number, whichever is smaller. The transfer facility may round the number in order to fit it into the System/36 field. Refer to the “Data Conversions” in this chapter for more details.*

- A comment. This is an optional entry for your information only. If you type a comment, it must be separated from the size entry by a blank.

The following is an example of a PCFL entry:

**PCFL CUSTNAME 1 20 CUSTOMER NAME**



## Comment Lines

If you wish, you can enter comment lines anywhere in the file description file. To do this, use an asterisk (\*) as the first nonblank character in the line, as follows:

**\* This is a comment line**

A comment line must not be the first line in the file description file.

## Example

The following is an example of a file description file for an inventory file:

```
PCFDF
PCFT 3 BASIC SEQUENTIAL FILE
* ITEM INVENTORY FILE
PCFL ITEMNO 2 8 ITEM NUMBER
PCFL ITEMDESC 1 20 DESCRIPTION OF ITEM
PCFL COLOR 1 8 COLOR
PCFL WEIGHT 2 7/2 ITEM WEIGHT
PCFL PRICE 2 7/2 PRICE PER ITEM
PCFL INSTOCK 2 6 ITEMS IN STOCK
```

# Data Conversions

Data conversions are needed in the transfer facility for transferring data from the System/36 to the personal computer, and from the personal computer to the System/36. For both types of transfers, the conversion necessary depends on the type of data being transferred, the type of personal computer file being used, the System/36 data type and, in some cases, the length of the data.

## Data Types

The following System/36 data types are supported:

- Character data
- Hexadecimal data
- Binary data
- Zoned decimal data
- Packed decimal data

The following personal computer data types are supported:

- Character data
- Hexadecimal data
- Binary data
- Zoned decimal data
- Packed decimal data
- BASIC numeric data, including:
  - Single-precision data
  - Double-precision data
  - Integer data
- ASCII numeric data

## **Character Data**

This data can be thought of as a string of bits that represent particular characters and symbols. The personal computer uses ASCII conventions and the System/36 uses EBCDIC conventions.

# ASCII Character Set Table

The ASCII character set table is shown below:

		First Hexadecimal Character																
		0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F	
ASCII CHARACTER SET	0	BLANK NULL	▶	BLANK SPACE	0	@	P	‘	p	ƒ	Ē	á					∞	≡
	1	☺	◀	!	1	A	Q	a	q	ü	æ	í					β	±
	2	☹	↑	"	2	B	R	b	r	é	Æ	ó					γ	≥
	3	♥	!!	#	3	C	S	c	s	â	ô	ú					π	≤
	4	♦	¶	\$	4	D	T	d	t	ä	ö	ñ					Σ	∫
	5	♣	§	%	5	E	U	e	u	â	ò	Ñ					σ	∫
	6	♠	■	&	6	F	V	f	v	ä	û	á					μ	÷
	7	•	↓	'	7	G	W	g	w	ç	ù	ó					τ	≈
	8	•	↑	(	8	H	X	h	x	ê	ÿ	í					Φ	°
	9	○	↓	)	9	I	Y	i	y	ë	Ö	Γ					⊖	•
	A	○	→	*	:	J	Z	j	z	è	Ü	Γ					Ω	•
	B	♂	←	+	;	K	l	k	{	ï	ç	½					δ	√
	C	♀	└	,	<	L	\	l		î	ℒ	¼					∞	η
	D	♪	↔	-	=	M	l	m	}	ï	ÿ	ı					∅	²
	E	♪	▲	.	>	N	^	n	~	Ä	Pls	«					€	█
	F	☼	▼	/	?	O	_	o	Δ	Å	f	»					∩	BLANK ET

# EBCDIC Character Set Table

The EBCDIC character set table is shown below:

		First Hexadecimal Character															
		0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
Second Hexadecimal Character	0					<small>Scor</small> &	-	ø	Ø	°	μ	¢	{	}	\	0	
	1					<small>Hex. 10</small> <small>Scor</small> e	/	Ē	a	j	~	ℒ	A	J	<small>Hex. 10</small> <small>Scor</small> 1		
	2					â	ê	Ā	Ê	b	k	s	Ƴ	B	K	S	2
	3					ä	ë	Ā	Ë	c	l	t	<small>Pts</small>	C	L	T	3
	4					à	è	À	È	d	m	u	f	D	M	U	4
	5					á	í	Ā	Ī	e	n	v	§	E	N	V	5
	6					ã	ï	Ā	Ī	f	o	w	¶	F	O	W	6
	7					â	î	Ā	Ī	g	p	x	¼	G	P	X	7
	8					ç	ï	Ç	Ī	h	q	y	½	H	Q	Y	8
	9					ñ	β	Ñ	`	i	r	z	¾	I	R	Z	9
	A					€	!	!	:	<<	a	i	∟	-	≥	2	3
	B					.	\$	,	#	>>	o	ı		ô	û	Ô	Û
	C					<	*	%	@	đ	æ	Ð	≠	ö	ü	Ö	Ü
	D					(	)	-	'	≤	♪	↑	∴	ò	ù	Ò	Ù
	E					+	;	>	=	þ	Æ	þ	∕	ó	ú	Ó	Ú
	F						∟	?	"	±	⊗	®	=	õ	ÿ	Õ	

## **Translation Tables**

The tables used to translate characters from ASCII to EBCDIC, and from EBCDIC to ASCII contain the following kinds of values:

- Values where the personal computer ASCII characters and the System/36 EBCDIC characters match exactly.
- Values where the personal computer ASCII character has no corresponding System/36 EBCDIC character, and values where the System/36 EBCDIC character has no corresponding personal computer character. These characters are referred to as characters that could not be translated, and they are identified by a table entry of 00.
- Values where a substitute character was chosen for a character that could not be translated.

The transfer facility API uses the following tables to translate data from ASCII to EBCDIC and EBCDIC to ASCII. You can change these default tables using TRTABLE. Refer to Chapter 7, “The Translation Table Utility,” for a description of the default tables and how to change them.

# ASCII to EBCDIC Translation Table

		← First Hexadecimal Character →															
		0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
Second Hexadecimal Character	0	00	00	40	F0	7C	D7	79	97	68	71	45	00	00	00	00	00
	1	00	00	5A	F1	C1	D8	81	98	DC	9C	55	00	00	00	59	8F
	2	00	00	7F	F2	C2	D9	82	99	51	9E	CE	00	00	00	00	DA
	3	00	00	7B	F3	C3	E2	83	A2	42	CB	DE	4F	00	00	00	8D
	4	00	B6	5B	F4	C4	E3	84	A3	43	CC	49	00	00	00	00	00
	5	00	B5	6C	F5	C5	E4	85	A4	44	CD	69	00	00	00	00	00
	6	00	00	50	F6	C6	E5	86	A5	47	DB	9A	00	00	00	A0	00
	7	00	00	7D	F7	C7	E6	87	A6	48	DD	9B	00	00	00	00	00
	8	00	00	4D	F8	C8	E7	88	A7	52	DF	AB	00	00	00	00	90
	9	00	00	5D	F9	C9	E8	89	A8	53	EC	00	00	00	00	00	00
	A	00	00	5C	7A	D1	E9	91	A9	54	FC	5F	00	00	00	00	00
	B	00	00	4E	5E	D2	00	92	C0	57	4A	B8	00	00	00	00	00
	C	00	00	6B	4C	D3	E0	93	6A	56	B1	B7	00	00	00	00	00
	D	00	00	60	7E	D4	00	94	D0	58	B2	AA	00	00	00	80	EA
	E	00	00	4B	6E	D5	00	95	A1	63	B3	8A	00	00	00	00	00
	F	9F	00	61	6F	D6	6D	96	00	67	B4	8B	00	00	00	00	00

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# EBCDIC to ASCII Translation Table

		← First Hexadecimal Character →															
	Second Hexadecimal Character	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0	0	00	00	00	00	20	26	2D	ED	ED	F8	E6	9B	7B	7D	5C	30
1	0	00	00	00	00	20	82	2F	90	61	6A	7E	9C	41	4A	20	31
2	0	00	00	00	00	83	88	83	88	62	6B	73	9D	42	4B	53	32
3	0	00	00	00	00	84	89	8E	89	63	6C	74	9E	43	4C	54	33
4	0	00	00	00	00	85	8A	85	8A	64	6D	75	9F	44	4D	55	34
5	0	00	00	00	00	A0	A1	A0	A1	65	6E	76	15	45	4E	56	35
6	0	00	00	00	00	A6	8C	A6	8C	66	6F	77	14	46	4F	57	36
7	0	00	00	00	00	86	8B	8F	8B	67	70	78	AC	47	50	58	37
8	0	00	00	00	00	87	8D	80	8D	68	71	79	AB	48	51	59	38
9	0	00	00	00	00	A4	E1	A5	60	69	72	7A	00	49	52	5A	39
A	0	00	00	00	00	9B	21	7C	3A	AE	A6	AD	AA	2D	F2	FD	00
B	0	00	00	00	00	2E	24	2C	23	AF	A7	A8	B3	93	96	93	96
C	0	00	00	00	00	3C	2A	25	40	00	91	00	00	94	81	99	9A
D	0	00	00	00	00	28	29	5F	27	F3	00	18	00	95	97	95	97
E	0	00	00	00	00	2B	3B	3E	3D	00	92	00	27	A2	A3	A2	A3
F	0	00	00	00	00	B3	AA	3F	22	F1	0F	00	CD	A7	98	A7	00

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## Substitution Values for the EBCDIC to ASCII Translation Table

EBCDIC Hexadecimal Code	Character Description	ASCII Hexadecimal Code	Character Substituted
46	Lowercase a-tilde	A6	Lowercase a-underbar
62	Uppercase A-caret	83	Lowercase a-caret
64	Uppercase A-grave accent	85	Lowercase a-grave accent
65	Uppercase A-acute accent	A0	Lowercase a-acute accent
66	Uppercase A-tilde	A6	Lowercase a-underbar
70	Lowercase slash-o	ED	Uppercase slash-O
72	Uppercase E-caret	88	Lowercase e-caret
73	Uppercase E-umlaut	89	Lowercase e-umlaut
74	Uppercase E-grave accent	8A	Lowercase e-grave accent
75	Uppercase I-acute accent	A1	Lowercase i-acute accent
76	Uppercase I-caret	8C	Lowercase i-caret
77	Uppercase I-umlaut	8B	Lowercase i-umlaut
78	Uppercase I-grave accent	8D	Lowercase i-grave accent
BB	Vertical bar	B3	Vertical line
BE	Acute accent	27	Apostrophe
BF	Alternate hyphen	CD	Double horizontal lines
CA	Overscore	2D	Hyphen
CF	Lowercase o-tilde	A7	Lowercase o-underbar
EB	Uppercase O-caret	93	Lowercase o-caret
ED	Uppercase O-grave accent	95	Lowercase o-grave accent
EE	Uppercase O-acute accent	A2	Lowercase o-acute accent
EF	Uppercase O-tilde	A7	Lowercase o-underbar
FB	Uppercase U-caret	96	Lowercase u-caret
FD	Uppercase U-grave accent	97	Lowercase u-grave accent
FE	Uppercase U-acute accent	A3	Lowercase u-acute accent

## Hexadecimal Data

This data can also be thought of as a string of bits representing base 16 numbers. For example, the hexadecimal value 3D can be represented by the following string of bits:

**0011 1101**

## Binary Data

This data represents signed or unsigned numbers in two's complement form. Binary numbers of 1, 2, 3, or 4 bytes in length are allowed on the personal computer, but the System/36 only allows 2 or 4 bytes in length. The leftmost bit determines the sign of the number (0 for positive, 1 for negative). The System/36 stores the data with the high-order byte in the leftmost position of the field while the personal computer stores the data with the high-order byte in the rightmost position of the field.

The decimal position, if specified, represents the number of decimal digits to the right of the decimal point. The presence of a decimal position is specified by the file description.

For example, the binary number 3BF5 is equivalent to the decimal number 15349, and the binary number FFB4 is equivalent to the decimal number -76.

## Zoned Decimal Data

This data is represented in a form in which each byte corresponds to one decimal digit. Each of these bytes is stored in character form. For example, the digit 7 is stored on the System/36 as F7, which is the EBCDIC representation, and is stored on the personal computer as 37, which is the ASCII representation.

The size of each digit is determined by its rightmost half-byte. Valid values for the half-bytes are decimal 0 through 9.

The sign in both System/36 and personal computer zoned decimal fields is specified by the hexadecimal value in the leftmost half-byte of the rightmost byte of the field. For the System/36, a hexadecimal B or D in this half-byte represents a negative number (for example, F6D2 represents -62). For the personal computer, a negative number is represented by a hexadecimal B in this half-byte (for example, 36B2 represents -62). Anything else in the leftmost half-byte of the rightmost byte of the field indicates that the number is positive.

The decimal position, if specified, represents the number of decimal digits to the right of the decimal point. The presence of a decimal position is specified by the file description.

## Packed Decimal Data

For both the System/36 and the personal computer, each half-byte represents a value from 0 through 9. The sign is specified by the hexadecimal value in the rightmost half-byte of the rightmost byte.

For the System/36, a value of hexadecimal B or hexadecimal D in this half-byte represents a negative number. For the personal computer, a value of hexadecimal B in this half-byte represents a negative number. For example, for the System/36 and the personal computer, 09436B represents -9436. Anything else in this half-byte indicates that the number is positive.

The decimal position, if specified, represents the number of decimal digits to the right of the decimal point. The presence of a decimal position is specified in the file description.

## Single-Precision Data

Single-precision data is defined only for the personal computer. It is not a supported System/36 data type. Single-precision data is used by BASIC applications. This data type is a number in the range of  $2.938736 \times 10^{-39}$  to  $1.701412 \times 10^{38}$  positive or negative.

Single-precision numbers are stored in 4 bytes – 3 bytes representing the mantissa, and 1 byte representing the exponent.

## **Double-Precision Data**

Double-precision data is defined only for the personal computer. It is not a supported System/36 data type. Double-precision data is used by BASIC applications. This data type is a number in the range of  $2.938735877055719 \times 10^{-39}$  to  $1.701411834604692 \times 10^{38}$  positive or negative. Double-precision numbers are stored in 8 bytes – 7 bytes representing the mantissa, and 1 byte representing the exponent.

## **Integer Data**

Integer data is defined only for the personal computer. Integer data is used by BASIC applications. Integer data is stored in 2 bytes and represents a whole number in the range -32768 to 32767.

## ASCII Numeric Data

ASCII numeric data is defined by the transfer facility to represent any numeric value stored in ASCII format. This is not a valid System/36 data type. For example, the number -123.45 in ASCII format would be:

**2D 31 32 33 2E 34 35**

The decimal point and sign are stored explicitly for ASCII numeric data. The leftmost character displays the sign (blank for positive, - for negative). Leading zeros to the left of the decimal point are changed to blanks. The decimal point, if any, is added in the correct position.

BASIC sequential and DIF file types also support another form of ASCII numeric data called exponential numbers. An exponential number is a decimal number followed by the letter E or D and a signed integer of two or three digits. E represents a single-precision number and D represents a double-precision number. The exponent portion (E or D and the integer) represents *times ten to the power of the integer specified*.

For example, the number -1.0E+03 (representing  $-1.0 \times 10^3$  in ASCII numeric format) would be:

**2D 31 2E 30 45 2B 30 33**

For example, the number 9.5D-15 (representing  $9.5 \times 10^{-15}$  in ASCII numeric format) would be:

**39 2E 35 44 2D 31 35**

# Personal Computer File Types

The following personal computer file types are supported:

- ASCII text files
- DOS random files
- BASIC sequential files
- BASIC random files
- DIF (Data Interchange Format) files
- No conversion files

## ASCII Text Files

ASCII text files are normally used with programs that work with text (such as editors, formatters, and print routines). The characteristics of an ASCII text file are as follows:

- Records consist of ASCII characters.
- Each record is delimited from the next by a carriage return character (hexadecimal 0D) and a line feed character (hexadecimal 0A). The character for end-of-file is hexadecimal 1A.
- Records from the System/36 are fixed length. The transfer facility truncates all trailing blanks from each System/36 record. Therefore, the personal computer records in an ASCII text file may be variable length.

## **Transferring Data to ASCII Text Files**

There are two ways you can transfer data to an ASCII text file:

- Transfer data that is not defined by IDDU data definitions. This type of transfer assumes that all the data being transferred is EBCDIC character data, and the data is made up of only records and not fields.

An example of this data transfer is a System/36 library member. The entire member can be transferred to an ASCII text file and edited with a personal computer editor. ASCII text files are used by programs that work with character data. Remember, if the data to be transferred contains any numeric data that cannot be translated on an EBCDIC to ASCII basis, this data will be written in the file as hexadecimal zeros.

- Transfer data that is defined by IDDU data definitions. It is better to use this type of data transfer for files used by application programs that process numeric data and not character data.



The following list describes how the data that comes from the System/36, when creating an ASCII text file defined by IDDU data definitions, is converted:

- Hexadecimal fields are converted to equivalent ASCII characters for each half-byte. For example, hexadecimal D3 is expanded to ASCII 4433 and written to the file. When displayed by an editor or printed, the string appears as D3.
- EBCDIC character fields are converted byte-by-byte into ASCII equivalents. EBCDIC characters for which there are no equivalent ASCII characters are converted to hexadecimal zeros.
- Binary fields are converted to ASCII numeric. For example, hexadecimal FFD3 with no decimal position, is expanded to ASCII 2020202D3435. When displayed by an editor or printed, the string appears as -45. Note that the length of the ASCII field depends on the length of the binary field.

A binary field on the System/36 is either 2 bytes or 4 bytes in length. The resulting ASCII field length is from 6 bytes to 11 bytes, including the sign. In addition, the resulting ASCII length is 1 byte greater if a decimal point is added.

The following table shows the mapping between binary field lengths and their ASCII lengths:

<b>Binary Length</b>	<b>ASCII Length</b>	<b>Value Range</b>
2	6	-32768 to 32767
4	11	-2147483648 to 2147483647

- Zoned decimal fields are converted to ASCII numeric. For example, EBCDIC F0F0F9F5F2D6 with a field length that indicates 2 digits to the right of the decimal point is expanded to ASCII 20202D39352E3236. When displayed by an editor or printed, the string appears as -95.26. The length of the resulting personal computer field is equal to the length of the System/36 field plus one for the sign and plus one for the decimal point, if specified.
- Packed decimal fields are converted to ASCII numeric. For example, hexadecimal 871D (no decimal point) is converted to ASCII 2D383731. When displayed by an editor or printed, the string appears as -871.

Since two decimal digits are packed into one byte, the length of the resulting personal computer field is equal to two times the length of the System/36 field, plus one for the decimal point, if specified. This length always includes the sign. A minus sign indicates negative, and a blank indicates positive.

# Transferring Data from ASCII Text Files

When transferring data from ASCII text files to System/36 files, the data is converted as follows:

- ASCII character data is converted to EBCDIC character data or to hexadecimal data. ASCII to EBCDIC conversion is done on a byte-to-byte basis. ASCII to hexadecimal conversion is done by converting two ASCII bytes into one hexadecimal byte.
- ASCII numeric data is converted to System/36 binary, zoned decimal, or packed decimal data, depending on the specified System/36 data type.

The length of the fields on the System/36 and the personal computer will probably be different because of the explicit way minus signs and decimal points are stored in ASCII numeric fields. This means that each field will be converted individually, to ensure that the resulting field length matches the System/36 specifications for that field. The transfer facility tries to fit the personal computer data into the System/36 field.

## **Errors When Transferring Data from ASCII Text Files**

When transferring data from a personal computer ASCII text file to a System/36 file defined by IDDU data definitions, the following errors can occur:

- Data in this field is too long for the System/36 field: The data will be truncated. Character data is defined by the personal computer file description file to be longer than the field length specified for the System/36 file. If the data is to be transferred to an EBCDIC field, this error occurs only if the extra bytes are not blanks.

If the data is to be transferred to a hexadecimal field, this error occurs only if the extra bytes are not zeros. These extra bytes are truncated so that the data will fit into the specified System/36 field.

- Numeric data has too many digits for the System/36 field: The maximum value will be used. This error occurs when:
  - Numeric data in the personal computer field does not fit into the specified number of bytes for the System/36 field.
  - The decimal value of a numeric field contains more digits than were specified for the System/36 field.

The value of the field is set to the maximum value possible for the number of bytes and digits specified by the System/36.

- Data in this field has too many decimal positions: The number will be rounded. The number of decimal positions in the personal computer field is greater than the number of decimal positions specified on the System/36. The extra bytes are significant. The data is rounded up if the first extraneous digit is 5 or greater, and rounded down if it is less than 5.
- Data in this field is incorrect or does not match the personal computer data type. This error occurs when:
  - Data that is not numeric has been found in a field defined as numeric by the file descriptions. When this error occurs, the transfer request is ended to prevent transferring incorrect data to the System/36 file.
  - ASCII numeric data has been found which does not match the format specified by the file description. This could be caused by the decimal point being in an incorrect position within the field.

- **Data for this field is missing:** The default values will be used. A data field has been defined, but the data is not in the file. This means that the end of the record has been reached before all of the defined data was found.

When this error occurs, the field or fields for which data has been defined but not found are filled with default values and transferred to the System/36 file. These default values are EBCDIC blanks for character fields, or zeros for numeric and hexadecimal fields.

- **Extra data found at the end of this record:** The extra data will not be transferred. Extra data was found at the end of this record, and this data was not defined by the System/36 IDDU data definitions or personal computer file description file. This extra data is not transferred to the System/36 file because no definitions exist to define the data and how it should be converted.

When transferring data from an ASCII text file to a System/36 file without IDDU data definitions, any extra data found past the record length specified for the System/36 file is not transferred.

## DOS Random Files

DOS random files are fixed-length files that can be used by the DOS random read and write routines. The characteristics of DOS random files are as follows:

- There are no end-of-record or end-of-file markers.
- Records are delimited by their fixed length, relative positions in the file, and the total length of the file.

## Transferring Data to DOS Random Files

There are two ways to transfer data to a DOS random file:

- Transfer data that is not defined by IDDU data definitions. This type of transfer assumes that all the data to be transferred is EBCDIC character data, and the data is records only and not fields.

It is recommended that data not defined by IDDU data definitions be transferred only to ASCII text files because editors working with character data use ASCII text files. If this type of data is transferred to a DOS random file, the file will consist of fixed length character records. Remember, numeric data in the record will probably be untranslatable and will be converted into hexadecimal zeros, because the only conversion for this type of transfer is EBCDIC to ASCII.

- Transfer data that is defined by IDDU data definitions. This type of data transfer results in each field being converted according to the System/36 field type.

The following list describes how the data that comes from the System/36, when creating a DOS random file defined by IDDU data definitions, is converted:

- Hexadecimal fields are not converted.
- Binary fields on the System/36 and the personal computer are represented as two's complement numbers, so converting of individual bytes is unnecessary. The personal computer uses the convention of storing its numeric values with the least significant byte in the leftmost byte position. Therefore, the transfer facility reverses the order of the bytes in binary fields.

For example, hexadecimal CEF3 that comes from the System/36 as a 2-byte binary number (representing the value -12557) appears as hexadecimal F3CE.

- EBCDIC character fields are converted byte-by-byte into ASCII equivalents. EBCDIC characters for which there are no equivalent ASCII characters are converted to hexadecimal zeros.



- Zoned decimal fields from the System/36 are converted from EBCDIC to ASCII just like character fields except that the sign half-byte in the personal computer converted field is hexadecimal 3 to indicate a positive number and hexadecimal B to indicate a negative number.

For example, EBCDIC F0F1F2F5F2D6 appears as ASCII 3031323532B6.

- Packed decimal fields are not changed except for the last half-byte, which contains the sign. The personal computer uses hexadecimal 3 to indicate a positive number and hexadecimal B to indicate a negative number in the sign half-byte.

For example, hexadecimal 0865431F appears as hexadecimal 08654313.

# **Transferring Data from DOS Random Files**

When transferring data from DOS random files to System/36 files, the data is converted as follows:

- Hexadecimal fields are transferred as they are; they are not converted. The length of the field on the System/36 should be the same as the length of the field on the personal computer.
- Binary fields in the personal computer file are stored in an order reversed from that expected by the System/36 file; these bytes are reversed and transferred to the System/36 file.
- ASCII character data is converted to EBCDIC character data. This data is converted on a byte-by-byte basis.
- Zoned decimal data in ASCII format is translated byte-for-byte to zoned decimal data in EBCDIC format.
- Packed decimal data in ASCII format is translated byte-for-byte to packed decimal data in EBCDIC format.

## **Errors When Transferring Data from DOS Random Files**

When transferring data from a DOS random file to a System/36 file defined using IDDU data definitions, the following errors can occur:

- Data in this field is too short for the System/36 field: The data will be padded. Character or hexadecimal data shorter than the field length specified for the System/36 field was found in the personal computer file. This could occur if the length of the personal computer field was defined to be less than the length of the System/36 field, or if the data in the last record of the file was too short. Character fields are padded on the right with EBCDIC blanks. Hexadecimal fields are padded on the right with zeros.
- Data in this field is too long for the System/36 field: The data will be truncated. Character or hexadecimal data was defined by the personal computer file description file to be longer than the field length specified for the System/36 file.

For character data, this error occurs only if the extra bytes are not blanks. For hexadecimal data, this error occurs only if the extra bytes are not zeros. These extra bytes are truncated so that the data will fit into the specified System/36 field.

- **Numeric data has too many digits for the System/36 field:** The maximum value will be used. This error occurs when:
  - Numeric data in the personal computer field does not fit into the specified number of bytes for the System/36 field.
  - The decimal value of a numeric field contains more digits than were specified for the System/36 field.

The value of the field is set to the maximum value possible for the number of bytes and digits specified by the System/36.

- **Data in this field has too many decimal positions:** The number will be rounded. The number of decimal positions in the personal computer field is greater than the number of decimal positions specified on the System/36. The extra bytes are significant. The data will be rounded up if the first extraneous digit is 5 or greater, and rounded down if it is less than 5.
- **Data in this field is incorrect or does not match the personal computer data type:** Data that is not numeric has been found in a field defined as numeric by the file descriptions. When this error occurs, the transfer request is ended to prevent transferring incorrect data to the System/36 file.

- Data for this field is missing: The default values will be used. A data field has been defined, but the data is not in the file. This means that the end of the file has been reached before all of the defined data was found.

When this error occurs, the field or fields for which data has been defined but not found are filled with default values and transferred to the System/36 file. These default values are EBCDIC blanks for character fields, or zeros for numeric fields.

When transferring data from a DOS random file to a System/36 file without IDDU data definitions, any data shorter than the record length defined for the System/36 file is padded with EBCDIC blanks.

Because DOS random files have no record delimiters, this error can occur only on the last record. This probably indicates that the record length of the System/36 file does not match the record length of the personal computer file.

## **BASIC Sequential Files**

BASIC sequential files are used by BASIC for sequential processing (for example, INPUT and WRITE statements). The fields written are considered either character or numeric. The characteristics of BASIC sequential files are as follows:

- Both numeric and character fields are written as characters that can be displayed. However, character strings are distinguished from numeric strings by surrounding them with ASCII double quotes (hexadecimal 22).

Therefore, character data in BASIC sequential files cannot contain ASCII double quotes, because they are interpreted as the end of the character string.

- Fields are delimited by ASCII commas (hexadecimal 2C).
- Each record is delimited from the next by a carriage return character (hexadecimal 0D) and a line feed character (hexadecimal 0A). The character for end-of-file is hexadecimal 1A.
- Records and fields are variable length.

## **Transferring Data to BASIC Sequential Files**

The following are ways to transfer data to a BASIC sequential file:

- Transfer data that is not defined by IDDU data definitions on the System/36. This type of transfer assumes that all the data to be transferred is EBCDIC character data. It also assumes that the data is made up of records and not fields.

It is recommended that data in this format be transferred only to ASCII text files, because editors work with ASCII text files. If this type of data is transferred to a BASIC sequential file, the file will consist of records containing one field each separated by CR and LF. Remember, if there is numeric data in the record, it probably will result in untranslatable data, if the data is not defined by IDDU data definitions, since all data conversion is EBCDIC to ASCII.

- Transfer data that is defined by IDDU data definitions. Because each data record is defined on a field basis, each numeric or character field can be converted accordingly.

The following list describes how the data that comes from the System/36, when creating a BASIC sequential file defined by IDDU data definitions, is converted:

- Hexadecimal fields are converted to equivalent ASCII characters for each half-byte. They are surrounded by double quotes.

For example, hexadecimal F3 is expanded to ASCII 22443322 and written to the file.

- EBCDIC character fields are converted byte-by-byte into ASCII equivalents. EBCDIC characters for which there are no equivalent ASCII characters are converted to hexadecimal zeros. ASCII double quotes are added before and after the character string.
- Binary fields are converted to ASCII numeric. Leading zeros to the left of the decimal point and trailing zeros to the right of the decimal point are removed.

For example, hexadecimal FFD3 appears as ASCII 2D3435. When displayed on an ASCII device, the string appears as -45.



- Zoned decimal fields are converted to ASCII numeric. Leading zeros to the left of the decimal point and trailing zeros to the right of the decimal point are removed.

For example, EBCDIC F0F0F9F5F2D6 with a field length that indicates 2 digits to the right of the decimal point is expanded to ASCII 2D39352E3236. When displayed by an editor or printed, the string appears as -95.26.

- Packed decimal fields are converted to ASCII numeric. Leading zeros to the left of the decimal point and trailing zeros to the right of the decimal point are removed.

For example, hexadecimal 871F (no decimal point) is converted to ASCII 383731. When displayed by an editor or printed, the string appears as 871.

## Transferring Data from BASIC Sequential Files

When transferring data from BASIC sequential files to System/36 files, the data is converted as follows:

- ASCII character data is converted to EBCDIC character data or to hexadecimal data. ASCII to EBCDIC conversion is done on a byte-by-byte basis. ASCII to hexadecimal conversion is done by converting two ASCII bytes into one hexadecimal byte.
- ASCII numeric data is translated to System/36 binary, zoned decimal, or packed decimal data, depending on the specified System/36 data type. The lengths of the System/36 data and the personal computer data will probably be different. This is because the minus signs and decimal points are stored in ASCII numeric fields, and leading and trailing blanks are stripped away.

In addition, BASIC may create exponential numbers in these files. The transfer facility will also convert these numbers.

Each translated field is individually checked to ensure that the resulting field length matches the System/36 specifications for that field. The transfer facility tries to fit the personal computer data into the System/36 field.

## **Errors When Transferring Data from BASIC Sequential Files**

When transferring data from a personal computer BASIC sequential file to a System/36 file described by IDDU data definitions, the following errors can occur:

- Data in this field is too long for System/36 field: The data will be truncated. Character data is defined by the personal computer file description file to be longer than the field length specified for the System/36 file.

If the data is to be transferred to an EBCDIC field, this error occurs only if the extra bytes are not blanks. If the data is to be transferred to a hexadecimal field, this error occurs only if the extra bytes are not zeros. These extra bytes are truncated so that the data will fit into the specified System/36 field.

- Numeric data has too many digits for the System/36 field. The maximum value will be used. This error occurs when:
  - Numeric data in the personal computer field does not fit into the specified number of bytes for the System/36 field.
  - The decimal value of a numeric field contains more digits than were specified for the System/36 field.

The value of the field will be set to the maximum value possible for the number of bytes and digits specified by the System/36.

- Data in this field has too many decimal positions: The number will be rounded. The number of decimal positions in the personal computer field is greater than the number of decimal positions specified on the System/36. The extra bytes are significant. The data is rounded up if the first extraneous digit is 5 or greater, and rounded down if it is less than 5.
- Data in this field is incorrect or does not match the personal computer data type. Data that is not numeric was found in a field defined as numeric by the file descriptions. This could also result if a numeric field was found and the field was defined by the System/36 to be character or hexadecimal, or if a character field was found and the field was defined by the System/36 to be numeric (zoned, packed, or binary).

When this error occurs, the transfer request is ended to prevent transferring incorrect data to the System/36 file.

- Data for this field is missing: The default values will be used. A data field has been defined, but the data is not in the file. This means that the end of the record has been reached before all of the defined data was found.

When this error occurs, the field or fields for which data has been defined but not found are filled with default values and transferred to the System/36 file. These default values are EBCDIC blanks for character fields, or zeros for numeric fields.

- Data in this field exceeds personal computer field size: The data will be lost. This error occurs when extra data has been found at the end of a field, and the data is not defined by the personal computer file description file. If the data is character, the extra bytes are truncated and not transferred to the System/36 file. If the data is numeric, the entire field is converted to zeros and transferred to the System/36 file.
- Extra data found at the end of this record: The extra data will not be transferred. Extra data was found at the end of this record, and this data was not defined by the System/36 IDDU data definitions or personal computer file description file. This extra data is not transferred to the System/36 because no definitions exist to define the data and how it should be converted.

When transferring data from a BASIC sequential file to a System/36 file without IDDU data definitions, the following errors can occur:

- Data in personal computer file is incorrect or does not match the personal computer data type: Numeric data has been found when trying to transfer character data. When this error occurs, the transfer request is ended to prevent transferring incorrect data to the System/36.
- Data in personal computer file is lost: One of the following has occurred:
  - Extra data has been found beyond the record length specified by the System/36. The extra bytes will be truncated and not transferred to the System/36 file.
  - More than one field has been found in this record. A transfer without IDDU data definitions will only transfer one field of data. The extra field or fields will not be transferred.

## **BASIC Random Files**

BASIC random files are the most general-purpose BASIC file type. BASIC random files contain fixed-length records with no delimiters between fields or records.

### **Transferring Data to BASIC Random Files**

The following are ways to transfer data to BASIC random files:

- Transfer data that is not defined by IDDU data definitions on the System/36. This type of transfer assumes that all the data to be transferred is EBCDIC character data. It also assumes that the data is made up of records and not fields.

It is recommended that data in this format be transferred only to ASCII text files, because editors that work with character data use ASCII text files. If this type of data is transferred to a BASIC random file, the file will consist of fixed length character records. Remember, if there is numeric data in the record, it probably will be untranslatable and will be converted into hexadecimal zeros. This is because the only conversion done on this type of transfer is EBCDIC to ASCII.

- Transfer data that is defined by IDDU data definitions. This type of transfer will result in each field being converted depending on the System/36 field type.

The following list describes how the data that comes from the System/36, when creating a BASIC random file and defined by IDDU data definitions, is converted:

- Hexadecimal fields are not converted.
- Conversion from a System/36 binary field depends on the length of the field:
  - Fields of 2 bytes, with no decimal positions to the right of the decimal point, are converted to 2-byte BASIC integer values. The only change made is that the order of the bytes is reversed.
  - Fields of 2 bytes, with decimal positions to the right of the decimal point, are converted to BASIC single-precision numbers.
  - Fields of 4 bytes are converted to BASIC double precision numbers.
- EBCDIC character fields are converted byte-by-byte into ASCII equivalents. EBCDIC characters for which there are no equivalent ASCII characters are converted to hexadecimal zeros.



- Zoned decimal fields are converted into one of the following BASIC variables depending on the length of the field and the number of decimal positions:
  - Zoned decimal fields of 4 bytes or less with no positions to the right of the decimal point are converted to a BASIC integer of an equivalent value. A zoned decimal field of 4 bytes or less, but with a decimal point, falls into the following category.
  - Zoned decimal fields up to 7 bytes (including those that did not fall into the previous category) are converted to a BASIC single-precision number of an equivalent value.
  - Zoned decimal fields greater than 7 bytes are converted to a BASIC double-precision number of an equivalent value.

- Packed decimal fields are converted into one of the following BASIC variables depending on the length of the field:
  - Packed decimal fields of 2 bytes or less with no positions to the right of the decimal point are converted to a BASIC integer of an equivalent value. A packed decimal field of 2 bytes or less, but with a decimal point, falls into the following category.
  - Packed decimal fields of up to 4 bytes (including those that did not fall into the previous category) are converted to a BASIC single-precision number of an equivalent value.
  - Packed decimal fields greater than 4 bytes are converted to a BASIC double-precision number of an equivalent value.

*Note: Conversions between binary, packed decimal, and zoned decimal numbers with decimal points are not exactly equivalent to their BASIC number counterparts because BASIC uses a binary number format that does not always convert exactly into decimal fractions.*

## Transferring Data from BASIC Random Files

When transferring data from BASIC random files to System/36 files, the data is converted as follows:

- Hexadecimal fields are transferred to the System/36 file as hexadecimal data (not converted). The lengths of the fields as they are stored on the personal computer should be the same as the lengths of the fields as they are stored on the System/36.
- ASCII character data is converted to EBCDIC character. The data is converted on a byte-by-byte basis.
- Numeric fields from BASIC Random files (BASIC integers, single-precision floating-point numbers, and double-precision floating-point numbers) are converted to System/36 binary data, zoned decimal data in EBCDIC format, or packed decimal data in EBCDIC format.

*Note: Because floating point numbers do not always convert exactly into decimal fractions, each number will automatically be converted into the most precise number possible with respect to the System/36 field length. If more precision is desired, a larger System/36 field size should be specified.*

## **Errors When Transferring Data from BASIC Random Files**

When transferring data from a personal computer BASIC random file to a System/36 file defined by IDDU data definitions, the following errors can occur:

- **Data in this field is too short for System/36 field:** The data will be padded. Character or hexadecimal data shorter than the field length specified on the System/36 has been found in the file. This error can occur if the personal computer field was defined to be shorter than the System/36, or if the data in the last record of the file was too short. Character fields are padded on the right with EBCDIC blanks, and hexadecimal fields are padded with zeros on the right.
- **Data in this field is too long for System/36 field:** The data will be truncated. Character or hexadecimal data is defined by the personal computer file description file to be longer than the field length specified on the System/36.

For character data, this error occurs only if the extra bytes are not blanks. For hexadecimal data, this error occurs only if the extra bytes are not zeros. These extra bytes are then truncated so that the data will fit into the specified System/36 field.

- **Numeric data has too many digits for the System/36 field:** The maximum number will be used. This error occurs when:
  - Numeric data in the personal computer field does not fit into the specified number of bytes for the System/36 field.
  - The decimal value of a numeric field contains more digits than were specified for the System/36 field.
- **Data in this field has too many decimal positions:** The number will be rounded. In BASIC random processing, this error will only occur if the value of the number is too small to fit into the System/36 specified field. The number will be rounded down to zero.

For example, the number 0.00001 will not fit into a System/36 zoned field which is specified as being two bytes in length and two decimal positions to the right of the decimal point. In this example, the resulting value would be zero.

- **Data for this field is missing:** The default values will be used. A data field has been defined, but the data is not in the file. This means that the end of the file has been reached before all of the defined data was found. For BASIC random files, this error occurs only on the last record in the file, since there are no explicit record delimiters.

When this error occurs, the field or fields for which data has been defined but not found are filled with default values and transferred to the System/36 file. These default values are EBCDIC blanks for character fields and zeros for numeric fields.

When transferring data from a BASIC random file to a System/36 file without IDDU data definitions, any data shorter than the record length defined for the System/36 file is padded with EBCDIC blanks.

Because there are no record delimiters in BASIC random files, this error can occur only on the last record of the file. This probably indicates that the record length of the System/36 file does not match the record length of the personal computer file.

## **Data Interchange Format (DIF) Files**

DIF files represent data in rows and columns. DIF files contain character and numeric data (positive and negative decimal numbers).

The DIF file format is used for data interchange between spreadsheet programs and other application programs. For more information, several commercial publications are available that describe this type of file in detail.

The transfer facility supports only the following two data types within DIF files:

- **Character data:** The data in a character cell (a *cell* can be thought of as one field in one record) must be enclosed in double quotes if there is an imbedded blank in the string. However, if the string begins with a quote, it must also end with a quote.
- **Numeric data:** The numeric data supported by the transfer facility consists of a decimal number that may contain a minus sign and/or a decimal point. Exponential numeric data is also supported.

## **Transferring Data to DIF Files**

The following are ways to transfer data to a DIF file:

- Transfer data that is not defined by IDDU data definitions on the System/36. This type of transfer assumes that all the data to be transferred is EBCDIC character data. It also assumes that the data is made up of records and not fields.

It is recommended that data in this format be transferred only to ASCII text files, because editors that work with character data use ASCII text files. If this type of data is transferred to a DIF file, the file will contain many rows (one row for each record transferred) of one cell each. Remember, if there is numeric data in the record that cannot be translated on an EBCDIC to ASCII basis, the entire record will become a DIF error cell.

- Transfer data that is defined by IDDU data definitions. Because each data record is defined on a field basis, each numeric or character field can be converted accordingly.



The following list describes how the data that comes from the System/36, when creating a DIF file defined by IDDU data definitions, is converted:

- Hexadecimal fields are converted to equivalent ASCII characters for each half-byte. They are surrounded by double quotes.
- EBCDIC character fields are converted byte-by-byte into ASCII equivalents. ASCII double quotes are added before and after the character string.
- Binary fields are converted to ASCII numeric. Leading zeros to the left of the decimal point and trailing zeros to the right of the decimal point are removed.

For example, hexadecimal FFD3 appears as ASCII 2D3435. When displayed or printed, the string appears as -45.

- Zoned decimal fields are converted to ASCII numeric. Leading zeros to the left of the decimal point and trailing zeros to the right of the decimal point are removed.

For example, EBCDIC F0F0F9F5F2D6 with a field length that indicates 2 digits to the right of the decimal point is expanded to ASCII 2D39352E3236. When displayed or printed, the string appears as -95.26.

- Packed decimal fields are converted to ASCII numeric. Leading zeros to the left of the decimal point and trailing zeros to the right of the decimal point are removed.

For example, hexadecimal 871D (no decimal point) is converted to ASCII 2D383731. When displayed or printed, the string appears as -871.

- If untranslatable data is found, the entire field becomes an error cell. An *error cell* results when untranslatable data is found when a DIF file is created or when an invalid calculation is done using the DIF file with a spread sheet program.

## Transferring Data from DIF Files

If an error cell is found when data is being transferred from a DIF file to the System/36, one of the following can occur, depending on the type of data in the file:

- If the System/36 field is a character (EBCDIC) field, it will be filled with untranslatable characters (hexadecimal zeros) and transferred to the System/36. A message will be displayed, telling you how many bytes of untranslatable data were transferred.
- If the System/36 field is a hexadecimal, zoned, packed, or binary field, you will receive an error message telling you that the data in this cell is incorrect, and the data will not be transferred to the System/36.

When transferring data from a System/36 file to a DIF file, the field names are placed in the first record and can be considered as column headings. When transferring DIF files back to the System/36, the first row must either be these field names (exactly as they are defined on the System/36) or data. If the first row does not consist of field names, the file is processed as if it contains only data.

No DIF header information is used when transferring the file to the System/36. To properly transfer a DIF file to the System/36, the file must be in the correct format (row and column). It is essential that the field names, if present, make up the first row of data. The subsequent records make up the remaining rows of data. Therefore, when attempting to transfer the data to the System/36, the file must be saved in the same format as when it was originally created by the transfer facility.

When transferring data from DIF files to System/36 files, the data is converted as follows:

- ASCII character data is converted to EBCDIC character data or to hexadecimal data. ASCII to EBCDIC conversion is done on a byte-by-byte basis. ASCII to hexadecimal conversion is done by converting two ASCII bytes to one hexadecimal byte.
- ASCII numeric data is converted to System/36 binary, zoned decimal, or packed decimal data, depending on the data type specified by the System/36.

The lengths of the fields on the System/36 and the personal computer will probably be different because of the explicit way minus signs and decimal points are stored in ASCII numeric fields. This means that each field will be converted individually, to ensure that the resulting field length matches the System/36 specifications for that field. The transfer facility tries to fit the personal computer data into the System/36 field.

## **Errors When Transferring Data from DIF Files**

When transferring data from a personal computer DIF file to a System/36 file with IDDU data definitions, the following errors can occur:

- **DIF file incomplete or incorrect:** The DIF file does not follow the standard DIF format. Processing will end, and no more records will be transferred.
- **Data in this field is too long for System/36 field:** The data will be truncated. Character or numeric data is defined by the personal computer file description file to be longer than the field length specified for the System/36 file.

For character data, this error occurs only if the extra bytes are not blanks. For hexadecimal data, this error occurs only if the extra bytes are not zeros. The extra bytes are truncated so that the data will fit into the specified System/36 field.

- **Numeric data has too many digits for the System/36 field:** The maximum value will be used. This error occurs when:
  - Numeric data in the personal computer field does not fit into the specified number of bytes for the System/36 field.
  - The decimal value of a numeric field contains more digits than were specified for the System/36 field.

The value of the field will be set to the maximum value possible for the number of bytes and digits specified by the System/36.

- Data in this field has too many decimal positions: The number will be rounded. The number of decimal positions in the personal computer field is greater than the number of decimal positions specified on the System/36. The extra bytes are significant. The data is rounded up if the first extraneous digit is 5 or greater, and rounded down if it is less than 5.
- Data in this field is incorrect or does not match the personal computer data type. One of the following has occurred:
  - Data that is not numeric was found in a field defined as numeric by the file descriptions.
  - A numeric field was found and the field was defined by the System/36 to be character or hexadecimal, or if a character field was found and the field was defined by the System/36 to be numeric (zoned, packed, or binary).
  - A DIF error cell was found and the System/36 field is hexadecimal or numeric (zoned, packed, or binary).

When this error occurs, the transfer request is ended to prevent transferring incorrect data to the System/36 file.

- **Data for this field is missing:** The default values will be used. A data field has been defined, but the data is not in the file. This means that the end of the record has been reached before all of the defined data was found.

When this error occurs, the field or fields for which data has been defined but not found are filled with default values and transferred to the System/36 file. These default values are EBCDIC blanks for character fields, or zeros for numeric fields.

- **Data in this field exceeds the personal computer field size:** The data will be lost. Extra data was found at the end of a field, and the data is not defined by the personal computer file description file. If the data is character, the extra bytes are truncated and not transferred to the System/36 file. If the data is numeric, the entire field is converted to zeros and transferred to the System/36 file.
- **Extra data found at the end of this record:** The extra data will not be transferred. Extra data was found at the end of this record, and this data was not defined by the System/36 IDDU data definitions or personal computer file description file. This extra data is not transferred to the System/36 because no definitions exist to define the data and how it should be converted.

When transferring data from a DIF file to a System/36 file without IDDU data definitions, the following errors can occur:

- DIF file incomplete or incorrect: The format of the DIF file does not follow the standard DIF format. Processing will end, and no more records will be transferred.
- Data in personal computer file is incorrect or does not match the personal computer data type: Numeric data has been found when trying to transfer character data. When this error occurs, the transfer request is ended to prevent transferring incorrect data to the System/36.
- Data in personal computer file is lost: One of the following has occurred:
  - More than one field has been found in the personal computer record. Extra data is not transferred to the System/36 file because this transfer consists of only one character field.
  - Extra data has been found beyond the record length specified by the System/36. The extra bytes will be truncated and not transferred to the System/36 file.



## **No Conversion Files**

No conversion files are defined by the transfer facility, and consist of data that has not been converted. For example, when data is transferred from the System/36 to a personal computer No conversion file, the data is transferred exactly as it is stored on the System/36.

The following are ways to transfer data using a No conversion file:

- Transfer data that is not defined by IDDU data definitions on the System/36. This is the recommended way. Because the data is not converted, any type of data in either EBCDIC or ASCII format can be transferred. The data is simply moved intact with no conversions or data integrity checks.
- Transfer data that is defined by IDDU data definitions. This type of transfer assumes that all the data to be transferred is in System/36 EBCDIC format (EBCDIC character, EBCDIC zoned decimal, EBCDIC packed decimal, binary, and hexadecimal).

## **Transferring Data to No Conversion Files**

When transferring data from the System/36 to a No conversion file, the data is transferred exactly as it is stored on the System/36.

## **Transferring Data from No Conversion Files**

If the data is defined by System/36 IDDU data definitions, the data types that exist in a No conversion file are EBCDIC System/36 data types only. When a No conversion file is transferred to the System/36, no data conversion or translation is performed.

However, the transfer facility verifies that all numeric data is in the proper EBCDIC format. If any numeric data is found that is not in the proper EBCDIC format, that data and any remaining data is not transferred.

If a file is transferred without data definitions, the data is assumed to contain one character field per record. In this case, the data is not checked when the file is transferred from the personal computer to the System/36.

## Errors When Transferring Data from No Conversion Files

When transferring data from a personal computer No conversion file to a System/36 file with IDDU data definitions, the following errors can occur:

- Data sizes must be equal: When transferring No conversion files, the length and decimal position specifications for the System/36 and the personal computer must match exactly. If not, no records will be transferred.
- Data in this field is too short for System/36 field: The data will be padded. Character or hexadecimal data shorter than the field length specified for the System/36 file was found in the personal computer file. This could occur if the data in the last record of the file was too short. Character fields are padded on the right with EBCDIC blanks. Hexadecimal fields are padded on the right with zeros.
- Data in this field is incorrect or does not match the personal computer data type. Data that is not numeric has been found in a field defined by the file descriptions as numeric. When this error occurs, the transfer request is ended to prevent transferring incorrect data to the System/36 file.

*Note: The data is checked assuming that the data is in EBCDIC format. If you want to transfer data in another format, data definitions and file descriptions should not be used, and the record lengths defined on the System/36 and the personal computer should be exactly the same.*

- **Data for this field is missing:** The default values will be used. A data field has been defined, but the data is not in the file. This error can occur only in the last record of the file, since No conversion files have no explicit record delimiters.

When this error occurs, the field or fields for which data has been defined but not found are filled with default values and transferred to the System/36 file. These default values are EBCDIC blanks for character fields, or zeros for numeric fields.

When transferring data from a personal computer No conversion file to a System/36 file without IDDU data definitions, if the data is shorter than the length specified for the System/36 file, the data is padded with EBCDIC blanks.

This error can occur only in the last record of the file and usually means that the record length of the System/36 file is not the same as the record length in the No conversion file.

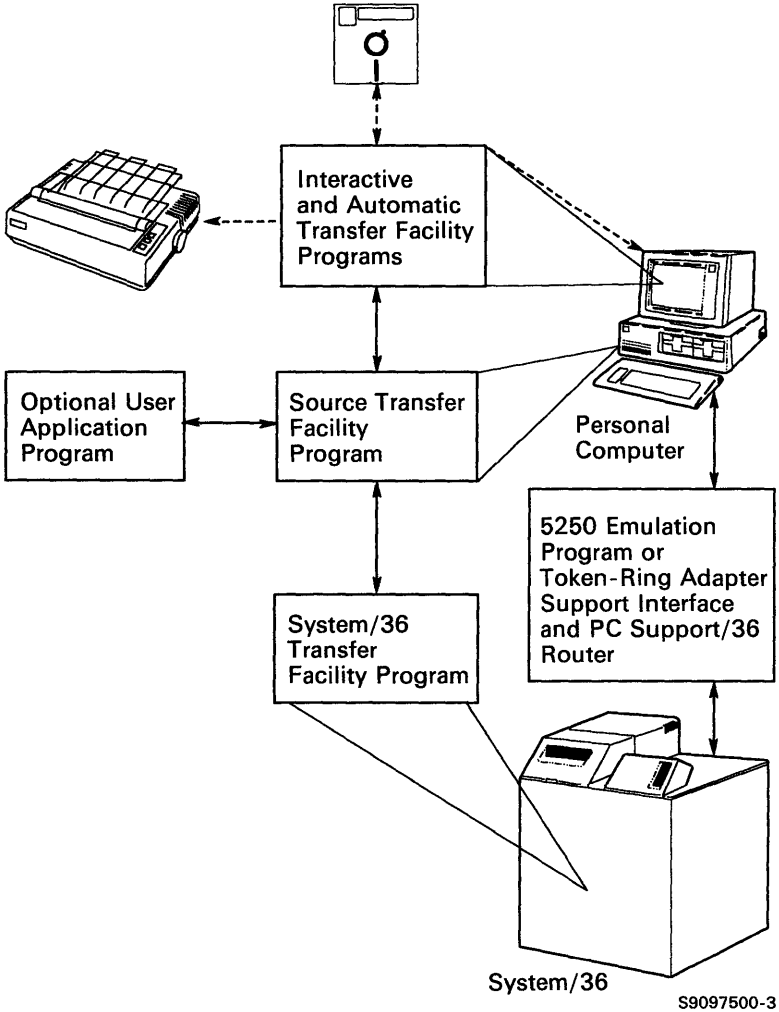
# Application Program Interface

The transfer facility consists of the following:

- System/36 transfer facility
- Personal computer transfer facility, which consists of two parts:
  - Interactive transfer facility programs or the automatic transfer facility programs
  - Source transfer facility program

The System/36 transfer facility program runs on the System/36. The personal computer transfer facility program (the source transfer facility and interactive or automatic transfer facility programs) runs on the personal computer.

The following illustration and description show how these programs relate to each other:



The interactive or automatic transfer facility program passes a request to the source transfer facility program. The source transfer facility program then passes the request to the System/36 transfer facility program.

The System/36 transfer facility program uses the request to retrieve the information from the System/36 IDDU data definitions and System/36 files or library members. This information is then returned to the source transfer facility program.

For a System/36-to-personal computer transfer request, the source transfer facility program passes the retrieved data, one record at a time, to the interactive or automatic transfer facility program. The interactive or automatic transfer facility program converts the System/36 data records to the format needed by the personal computer application program, and either displays the data on the personal computer display, prints the data on the personal computer printer, or writes the data to a personal computer diskette file.

For a personal computer-to-System/36 transfer request, the interactive or automatic transfer facility program sends data records, one at a time, to the source transfer facility program. The source transfer facility program then sends the data records to the System/36 transfer facility program. The System/36 transfer facility program writes the data to a System/36 disk file or a System/36 library member.

An application program interface is provided that allows you to write a personal computer application program. This application program can be used to create a transfer request instead of using the interactive or automatic transfer facility program. This could be a powerful tool that allows the personal computer application program to send data to or receive data from a System/36 file. Through the application programming interface, an application program can have up to eight transfer requests simultaneously open against System/36 files.



# Personal Computer Application Program Interface

A personal computer application program can send a transfer request from the personal computer to the System/36 and transfer records. To do this, the application program must access the 8088/8086 registers and perform interrupts, or it must interface to a machine language subroutine that does these things.

The source transfer facility program (STF.COM) must be loaded and run before the application program runs. (The router, STARTRTR.EXE, must be started before STF.COM can run.) This installs the source transfer facility program as a DOS-resident interrupt handler servicing interrupt vector hexadecimal 69 (or the interrupt vector you specified using the PCSI entry in the CONFIG.S36 file).

You can find out if STF.COM has been installed by checking offset hexadecimal 103 for each interrupt from hexadecimal 60 to hexadecimal 7F. If STF.COM is installed, you should find the following identifier:

**STF**

where **STF** is an ASCII character string.

The interface to STF.COM is similar to that of a DOS function call: the application program must set up the 8088/8086 registers for the function it wants performed, provide a buffer for STF.COM to use, and execute a software interrupt. STF.COM receives control, attempts to perform the requested function, and returns control to the application program with the 8088/8086 registers set to indicate the status of the request.

The functions that a personal computer application may request of STF.COM are:

- *Open a transfer request:* The application program passes to STF.COM a transfer request identifying the records it wants to transfer to or from the System/36.
- *Transfer a description:* After a transfer request is opened, the description of the fields within the System/36 data file is transferred to the application program as a group of records called templates. The application program saves the information in the templates for interpreting the actual records that are returned.

Each template contains the name, length, data type, and the maximum size of the number for a field that the application program requests. For binary, zoned decimal, or packed decimal data, the maximum size is expressed in decimal digits. For character or hexadecimal data, the decimal digits are always hexadecimal zero.

- *Return records:* When transferring data from the System/36 to the personal computer, the application program receives the records in the format described by the templates.

- *Send records:* When transferring data from the personal computer to the System/36, the application program sends data records to the System/36 in the format described by the templates.
- *Close the transfer request:* After the application program sends or retrieves the records to or from a particular file, the System/36 closes the file associated with the transfer request.
- *End the transfer request:* After the application program completes all requests, all active transfer requests are terminated.
- *Terminate the transfer request:* This request performs the same function as the close request, except that it ends the router conversation between the System/36 and the personal computer, and the personal computer is freed.

*Note: Terminating the transfer request is not the same as closing the transfer request. When you terminate a transfer request, the router conversation ends; when you close a transfer request, the router conversation remains active.*

These functions are requested by setting register AL to the specific function and providing a 4096-byte buffer to be associated with the transfer request while it is open. This buffer is referred to as the transfer request buffer. The application program passes the transfer request in the transfer request buffer; STF.COM places transferred data in the transfer request buffer. A transfer request is associated with its transfer request buffer until the transfer request is closed. Any functions requested for that transfer request must specify that particular buffer.

It is possible for an application program to have up to eight transfer requests open simultaneously, and send and retrieve data from all eight in any order, as long as each transfer request is associated with its own 4096-byte buffer.

Before returning control to the application program, STF.COM sets the 8088/8086 registers to indicate whether the operation was successful. This return code is in register AX.

If register AX contains hexadecimal 3000, 3100, or 0400, the System/36 may also send error text. In this case, the error text is returned in the transfer request buffer with register CX containing the length of the text (in bytes). A secondary return code can be returned in register DX. If this secondary return code is nonzero, the primary return code determines if the secondary has any meaning.

If the return code is zero, the operation was unconditionally successful. If the return code is greater than zero but less than hexadecimal 2000, the operation was successful; however, a warning condition was encountered. If the return code is greater than hexadecimal 2000, the operation was unsuccessful due to severe errors. All return codes correspond to the error messages described in the *PC Support/36 Messages Guide*.

A summary of the return codes set by STF.COM is described at the end of this section.

## Register Settings

When performing an interrupt to the STF interrupt vector 69 or the interrupt vector specified using the PCSI entry in the CONFIG.S36 file, the application program must set the 8088/8086 registers as follows:

**AL = 01** Open a transfer request.

Registers DS:BX must point to a 4096-byte buffer. This buffer contains the transfer request that describes the data that the personal computer application program wants to send or retrieve.

The transfer request must be an EXTRACT, REPLACE, or SELECT transfer request, and must be in ASCII format. (Refer to "Transfer Request Syntax" later in this section for a description of EXTRACT, REPLACE, and SELECT transfer requests.)

Register CX must contain the length (in bytes) of the transfer request and register DX must contain the length of the transfer request buffer (4096 bytes).

If the request was to send records from the System/36 to the personal computer and the open is successful, register CX contains a count of the number of fields in each returned record (the number of templates that can be requested). If the request was to send records from the personal computer to the System/36 and the return code in register AX is successful, register CX will contain zero.

*Note: If a warning message is sent, register CX will contain the length of the warning message and register DX will contain the number of fields if the transfer request was to send records from the System/36 to the personal computer.*

The transfer request is now considered open, and the application program may begin requesting or sending data. For either a System/36-to-personal computer or a personal computer-to-System/36 transfer request, the application program may proceed with function AL=02 (receive templates). This is optional.

Then, for a System/36-to-personal computer transfer request, you receive data using function AL=03. For a personal computer-to-System/36 transfer request, you send data using function AL=06. After each function call to STF.COM, register AX contains the return code. Refer to the *PC Support/36 Messages Guide* for information on return codes.

The return codes set by STF.COM are summarized at the end of this section.

*Note: For a personal computer-to-System/36 transfer request, if the file or library member contains data, the return code for the open will be 0400. This is a warning that if you proceed, the data in the file or library member will be replaced. If you proceed with function AL=02 or AL=06, the data will be replaced. If you do not proceed and you issue function AL=04 to close the transfer request, data in the file or library member remains intact.*

Once a transfer request has been successfully opened, a transfer request buffer is associated with the opened transfer request. It is not possible to send a "SELECT . . ." transfer request and a "REPLACE . . ." transfer request using the same buffer. If you want to use both types of transfer requests, a transfer request buffer must be allocated for "SELECT . . ." requests and another transfer request buffer must be allocated for "REPLACE . . ." requests. An "EXTRACT . . ." transfer request can be sent in either of the transfer request buffers.

**AL=02** Retrieve the templates.

Registers DS:BX must point to the transfer request buffer associated with the active transfer request. If the retrieval was successful, registers DS:BX point in the transfer request buffer to the template returned, and register CX contains the length of that template (40, hexadecimal 28). A template has the following format:

Byte 1 (field type):

- 00 Hexadecimal
- 01 Binary (two's complement)
- 02 EBCDIC character
- 03 EBCDIC zoned decimal
- 04 EBCDIC packed decimal

Bytes 2 and 3 (field length):

*For hexadecimal and character data types:* contains the total length (in bytes) of the field.

*For binary, packed and zoned data types:* byte 2 contains the length (in bytes), byte 3 contains the number of decimal positions to the right of the decimal point.



Bytes 4 through 33 (field name):

Name of the field as given in the data dictionary on the System/36, left-adjusted, and padded with blanks. If the System/36 file or library member is not defined by IDDU data definitions, this field name is blank.

*Note: If this is a JOIN request, the field name will be preceded by the file qualifier. For example, Tx.FIELDx, where x is 1 through 5.*

Byte 34 (digits):

*For binary, packed, or zoned data types:* contains the maximum number of digits that the field can hold. For example, if the maximum number of digits is 3, the maximum value of the field cannot be greater than 999.

Bytes 35 through 40:

Reserved.

One template is returned for each application program request `AL=02`. After all templates are returned, further requests for templates result in an end-of-file return code (register `AX=hexadecimal 1FFF`). When the System/36 file is defined by IDDU data definitions, you will receive one template for each field you specified in the `SELECT` or `REPLACE` statement. If the System/36 file or library member is not defined by IDDU data definitions, you will receive one template describing the entire record.

If the retrieval was unsuccessful, register `AX` contains the return code. Refer to the *PC Support/36 Messages Guide* for information on return codes.

The return codes set by `STF.COM` are summarized at the end of this section.

## **AL=03** Retrieve the records.

Registers DS:BX must point to the transfer request buffer associated with the active transfer request. If the retrieval was successful, registers DS:BX point in the transfer request buffer to the record returned, and register CX contains the length of that record (in bytes).

When transferring records, the application program, through register AH, can control whether the records are converted to a format compatible with personal computer ASCII or left in System/36 EBCDIC:

- If register AH is set to 0, the records are not converted.
- If register AH is set to 1, the records are converted in the same way the interactive or automatic transfer facility program converts records when writing to a DOS random file.
- If register AH is set to 2, the records are converted to DOS random file format, except that, when an untranslatable EBCDIC zoned decimal byte is found, the byte is converted to a hexadecimal 3F, and when an untranslatable EBCDIC packed decimal byte is found, the byte is converted to a hexadecimal FF.
- If register AH is not set to 0, 1, or 2, the records are converted as if register AH were set to 1. Refer to “Data Conversions,” described earlier in this chapter.

After all records for the transfer request are returned, the next request for a record results in an end-of-file return code (register AX = hexadecimal 1FFF), and the transfer request is automatically closed.

If the retrieval was unsuccessful, register AX contains the return code. If you have more than one active session and a return code of hexadecimal 5064 is returned on one of the active sessions, the error situation must be corrected and this operation (AL = 03) must be retried immediately. You must use the same session in which the error occurred in order to continue retrieving records.

Refer to the *PC Support/36 Messages Guide* for information on return codes.

The return codes set by STF.COM are summarized at the end of this section.

**AL = 04** Close the transfer request.

Registers DS:BX must point to the transfer request buffer for an active transfer request. If the request is successful, the transfer request is closed. No more data can be transferred.

A transfer request can also be closed by retrieving all records (AL = 03) from it until an end-of-file condition is returned, or by opening another transfer request using the transfer request buffer associated with the previous transfer request.

If the close was unsuccessful, register AX contains the return code. Refer to the *PC Support/36 Messages Guide* for information on return codes.

The return codes set by STF.COM are summarized at the end of this section.

*Note: If another transfer request is opened using the same transfer request buffer, the transfer request must be of the same type as the previous transfer request. For example, if a "SELECT . . ." transfer request was previously opened, another SELECT transfer request must be opened (an "EXTRACT . . ." is also allowed). If a "REPLACE . . ." transfer request was previously opened, another REPLACE transfer request must be opened (an "EXTRACT . . ." is also allowed).*

**AL=05** End all transfer request conversations.

This causes all transfer requests to be immediately closed and ends any current requests for data.

The return codes set by STF.COM are summarized at the end of this section.

*Note: It is recommended that you use the function AL=07 rather than this function. AL=07 ends one transfer request conversation at a time, rather than ending all transfer request conversations.*

## **AL=06** Send records.

For an active personal computer-to-System/36 transfer request, the next record is transferred to the System/36 file. Registers DS:BX must point to the transfer request buffer associated with the active transfer request. The next record that the application program wants to send to the System/36 file must be within that buffer (starting at the first byte), and register CX must contain the length of that record.

The fields within the record to be transferred must be in the same order as, and compatible with, the format of the System/36 file, as described by the templates returned when the transfer request was opened. For example, if the templates specified that the transfer request opened consisted of two fields, and that the first field was an 8-byte character field and the second field was a 4-byte packed field, any record to be transferred to the System/36 should be formatted exactly in that way in the transfer request buffer when using this function.

STF.COM will (if requested) translate the data from personal computer DOS random format to System/36 format. Refer to "Data Conversions," in this chapter.

Register AH must be set to hexadecimal 01 if the application program wants STF.COM to translate the records from personal computer DOS random format to System/36 format.

For example, if the transfer request buffer contains an 8-byte ASCII character field, STF.COM translates this to an 8-byte EBCDIC field before sending the record to the System/36. Otherwise, if AH is set to hexadecimal 00, the record in the transfer request buffer will be written to the System/36 file exactly as it is. This assumes that the application program has correctly translated the data into the System/36 format (for example, all character fields are EBCDIC).

Before sending the record to the System/36 file, STF.COM first checks for untranslatable data in the record. If the application program has set register AH to hexadecimal 00 (no translation), a check is still made for untranslatable data, but only for zoned decimal and packed decimal fields. If there is any untranslatable character data and register AH is set to hexadecimal 01 (translate), the untranslatable byte will be set to hexadecimal 00.

If the record only contains untranslatable character data, STF.COM will still allow the record to be transferred to the System/36. The number of untranslatable bytes in the record will be returned to the application program in register DX and register AX will be set to hexadecimal 0302 to indicate a warning (untranslatable character data found).



If there is untranslatable data in either zoned decimal or packed decimal fields (this check is made even if register AH is set to hexadecimal 00), STF.COM will *not* allow the record to be sent to the System/36. The position of the first untranslatable byte is returned in register DX, and register AX is set to hexadecimal 2003 (untranslatable numeric data found).

If no untranslatable data is found in the zoned decimal and the packed decimal fields, STF.COM will check to make sure that all numeric data (binary, zoned decimal, and packed decimal) fits into the range specified by the number of digits in the template for that field.

As soon as a digit range error is detected by STF.COM, processing will stop and STF.COM will return the position of the field in which the digit error occurred in register DX and will set register AX to hexadecimal 2004 (numeric data does not fit into range specified by digits).

For example, if a packed decimal field contains hexadecimal 5103 and the template for that field indicates that the number of digits is 2 (remember that the last half-byte is the sign), STF.COM will not send the record because the actual number contains 3 digits (510).

The application can send one record to the System/36 file each time this function is used. The application program indicates when it is finished sending records by performing a close operation.

If the send record request was successful, register AX will be set to hexadecimal 0000 or, if the record contained one or more fields that contained untranslatable character data, to 0302. Otherwise, register AX contains a return code. Refer to the *PC Support/36 Messages Guide* for information on return codes.

The return codes set by STF.COM are summarized at the end of this section.

After you are finished sending all records, you should issue function AL=04 to close the transfer request. The last group of records is sent to the System/36 and the System/36 file or library member is closed.

*Note: STF.COM and the router send data records in groups to the System/36. If an error occurs, the actual number of records that arrive on the System/36 is unpredictable. For example, if you received an error return code while sending record 100, only 50 records may actually be in the System/36 file or library member.*

**AL=07** End the transfer request conversation.

Registers DS:BX point to the transfer request buffer. Once the application program issues this request, the communication between the System/36 and the personal computer for that transfer request is ended. If the transfer request associated with this buffer was open, it will automatically be closed.

An application program should normally perform this function when it has closed a transfer request and does not plan to open another transfer request using that same buffer. This will release the personal computer and System/36 resources that were supporting the communication for that transfer request.

If an error is found, register AX will contain a return code that will be greater than hexadecimal 0000. Refer to the *PC Support/36 Messages Guide* for information on return codes.

The return codes set by STF.COM are summarized at the end of this section.

## Considerations

The storage requirements for the source transfer facility program will vary depending on the parameter (maximum number of transfer requests) specified in the STF.COM command. For each additional transfer request beyond 1, an additional 3.3K bytes of storage is needed.

The following are the storage requirements for the application program interface:

- With a monochrome display:
  - At least 24K for DOS (see note)
  - 16K if using the 5250 Emulation Program
  - 8K for the IBM Token-Ring Adapter Support Interface Program
  - At least 20K for the source transfer facility program
  
- With a color display:
  - At least 24K for DOS (see note)
  - 28K if using the 5250 Emulation Program
  - 8K for the IBM Token-Ring Adapter Support Interface Program
  - At least 20K for the source transfer facility program

*Note: The storage requirements for DOS and the 5250 Emulation Program vary, depending on the version you are using. Refer to the **IBM Personal Computer Disk Operating System** manual and the **5250 Emulation Program User's Guide** for detailed information on their storage requirements.*

- The 4096-byte transfer request buffer indicated by register DS:BX cannot cross a segment boundary; that is, register BX cannot be greater than hexadecimal F000.
- Generally, STF.COM does not detect if the data definitions on the System/36 are incorrect or if the data in the file itself is incorrect or damaged. However, STF.COM does some checking of data sent to the System/36 for such errors as untranslatable characters or too many digits in the numeric fields.
- If the application program already knows the format of the records being transferred, it can bypass retrieving templates and go directly from opening a transfer request to requesting or sending the records. However, it cannot go the other way. Once a request is made to retrieve or send records, the application program cannot retrieve templates without opening the transfer request again.

## Transfer Request Syntax

Three types of transfer requests can be passed by the application program to describe the data requested from the System/36:

- **SELECT** transfer requests
- **EXTRACT** transfer requests
- **REPLACE** transfer requests

## **SELECT Transfer Requests**

A SELECT transfer request is used to transfer data from the System/36 file or library member to a personal computer.

For example:

```
SELECT NAME,ADDRESS,SALARY  
FROM PAYROLL WHERE DEPT='200'
```

will retrieve records from the System/36 file named PAYROLL. The records will contain the name, address, and salary information for everyone in department 200.

If the System/36 file is defined by IDDU data definitions:

- The SELECT clause can contain the names of the fields to be transferred or an \* to transfer all fields (the entire record). Up to 60 fields can be transferred.
- The WHERE and ORDER BY clauses may be used as described.

If the System/36 file is *not* defined by IDDU data definitions, or a library member is being transferred:

- The SELECT clause must contain an asterisk (\*).
- The WHERE and ORDER BY clauses must not be specified.

The syntax for a SELECT transfer request is:

```
SELECT * FROM library-name { /P } /member-name
                          { /S }
```

**OF:**

```
SELECT { *
       [ T1. ] fieldname, [ T2. ] fieldname... }
```

```
FROM { file-name [ /format-name ]
       file-name [ /format-name ], file-name [ /format-name ]... }
      5 MAX
```

```
WHERE [ T1. ] fieldname { =
                        >
                        >=
                        <
                        <=
                        <>
                        >< } [ T2. ] fieldname, ..... AND (
```

```
( [ T1. ] fieldname { =
                   >
                   >=
                   <
                   <=
                   <>
                   ><
                   LIKE } value [ AND
                                OR ] ... [ ] [ AND
                                           OR ] ..... )
```

```
ORDER BY [ T1. ] fieldname [ ASC
                           DESC ] , [ T2. ] fieldname [ ASC
                                                         DESC ] ,....
```

**Notes:**

1. Braces ( { } ) indicate that one of the values enclosed in the braces must be specified.
2. Square brackets ( [ ] ) indicate that the expression is optional and may be omitted.
3. Value can be either a field name or a constant.
4. Underscores ( \_ ) show the default if you do not specify an optional parameter.

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Refer to Chapter 9, "Transferring Data from the System/36 to the Personal Computer" in the *PC Support/36 User's Guide* for additional information about the FROM, SELECT, WHERE, and ORDER BY prompts.

## **SELECT Transfer Request Considerations**

- The **WHERE** clause serves two purposes:
  - To identify the **JOIN** conditions, that is, conditions for joining records from more than one file
  - To identify **WHERE** conditions, that is, conditions that records must meet in order to be transferred or included in a group

The first portion of the **WHERE** clause identifies the **JOIN** conditions. **JOIN** conditions are required if more than one file is specified in the **FROM** clause. The **JOIN** conditions must immediately follow the **WHERE** keyword and must be separated from the **WHERE** conditions by **AND**. The **WHERE** conditions must be enclosed in a set of parentheses when **JOIN** conditions are specified.

- When joining records from more than one file, a field-name has the following syntax:

**[Tx.]field-name**

where **x** is a number in the range 1 through 5. **Tx.** is an optional file qualifier that identifies which file specified in the **FROM** clause contains the specified field-name. A file qualifier must be specified if the field-name is found in more than one file.

The following is an example of a transfer request that joins records from more than one file:

```
SELECT T1.CPRTNO,DESCRIPTION,PRICE
FROM SUPPLIERS,INVENTORY
WHERE T1.CPRTNO = T2.CPRTNO AND (SUPPNO = 51)
ORDER BY T1.CPRTNO
```



Note the following about the previous example:

- More than one file is specified in the FROM clause.
- One JOIN condition (T1.CPRTNO = T2.CPRTNO) is specified in the WHERE clause.
- One WHERE condition (SUPPNO = 51) is specified in the WHERE clause. The WHERE condition is enclosed in parentheses.
- The JOIN condition is separated from the WHERE condition by AND.

## **EXTRACT Transfer Requests**

EXTRACT transfer requests are used to obtain a list of names. You can use EXTRACT transfer requests to get a list of file, format, field, or library member names.

There are two formats for the EXTRACT transfer request:

- **EXTRACT TABLES**, which retrieves a list of file names, format names, or library member names. The format of the EXTRACT TABLES transfer request is:

### **EXTRACT TABLES [x]**

where **x** is an optional field that can be a file name or library name. If **x** is not specified, a list of all files that have IDDU data definitions is returned. If a file name is specified, a list of all the format names for that particular file name is returned. If a library name is specified, a list of library source and procedure member names is returned. If the library name is followed by a /S or a /P, then just the list of source or procedure names respectively will be returned.

For example:

## **EXTRACT TABLES PAYROLL**

returns all the format names that exist in the IDDU data definitions for the file name PAYROLL.

- **EXTRACT COLUMNS**, which retrieves a list of the field definitions for the file name and the specified format name. The format of the **EXTRACT COLUMNS** transfer request is:

### **EXTRACT COLUMNS y**

where **y** is a mandatory field that must be the file name, and may include a format name. If the file name is omitted, an error is returned.

You can specify up to five files for an **EXTRACT COLUMNS** transfer request. If the request is for more than one file, each field definition name will be preceded by [Tx.]. As a result, the field definition names cannot exceed 11 characters in length.

For example:

## EXTRACT COLUMNS PAYROLL/F1

returns a list of all the field definitions for format F1 in the file description associated with the file PAYROLL.

The syntax for an EXTRACT transfer request is:

EXTRACT TABLES	<pre>file-name [ ] file-name/format-name library-name [ ] library-name { /S               /P } [ ]</pre>
<b>OR:</b>	
EXTRACT COLUMNS	<pre>{ file-name [ /format-name ]   !-- 5 max.-----!</pre>
<p>Notes:</p> <ol style="list-style-type: none"><li>1. Braces ({} ) indicate that one of the values enclosed in the braces must be specified.</li><li>2. Square brackets ([ ]) indicate that the expression is optional and may be omitted.</li></ol>	

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After the EXTRACT transfer request is created, the application program passes it to STF.COM as if the application program were activating a transfer request using a SELECT transfer request.

STF.COM returns templates and records to the application program for an EXTRACT transfer request in the same way it returns records for a SELECT transfer request. For a SELECT transfer request, the records contain the actual data from a file; for an EXTRACT transfer request, the records contain descriptions of files, formats, fields, or library members.

The application program transfers these descriptions as if they were records being transferred by a SELECT transfer request. The error codes are the same for the EXTRACT transfer request and the SELECT transfer request. Thus, the records from an EXTRACT transfer request appear as if the descriptions were records returned from a System/36 file.

For an EXTRACT TABLES transfer request, the System/36 sends a file description to the personal computer in the following record format:

Bytes 1 through 8 (file name): Contain a character string.

Bytes 9 through 52 (file description): Contain a character string.

Bytes 53 through 54 (file record length): Contain a binary number.

For an EXTRACT TABLES file name transfer request, the System/36 sends a record definition to the personal computer in the following record format:

Bytes 1 through 8 (format name): Contain a character string.

Bytes 9 through 52 (format description): Contain a character string.

For an EXTRACT TABLES library-name transfer request, the System/36 sends the System/36 library member definition to the personal computer in the following record format:

Byte 1 (member type): Contains a character. This character is S for source or P for procedure.

Byte 2 (separator): Contains a slash (/).

Bytes 3 through 10 (member name): Contain a character string.

For an EXTRACT TABLES library-name/x transfer request (where x is an S for a source member or P for a procedure member), the System/36 sends the System/36 library member definition to the personal computer in the following record format:

Bytes 1 through 8 (member name): Contain a character string.

*Note: If a member type is specified on the transfer request, only the member name is returned.*

For EXTRACT COLUMNS transfer requests, the System/36 sends a field description to the personal computer in the following record format:

Bytes 1 through 8 (field definition name):  
Contain a character string.

Byte 9 (type of data in field):

C	Character
H	Hexadecimal
Z	Zoned decimal
P	Packed decimal
B	Binary numeric

Bytes 10 and 11 (length of field, in bytes): In binary.

Byte 12 (digits): Maximum number of digits the field can hold (in binary).

Byte 13 (decimal position): Number of digits to the right of the decimal point (in binary) – if the data type is not numeric, this byte is 0.

Bytes 14 through 57 (field definition description): Contain a character string.

## **REPLACE Transfer Requests**

A **REPLACE** transfer request is used to transfer data from the personal computer to a System/36 file or library member.

For example:

### **REPLACE NAME,SALARY INTO PAYROLL**

opens the System/36 file **PAYROLL** so that records can be transferred to that file. These records are to contain the fields **NAME** and **SALARY**. The **REPLACE** transfer request makes the templates for those fields available to the application program through the retrieve templates function. Note that if **PAYROLL** contains more than these two fields, the unspecified fields will be set to blanks for character fields and to zeros for numeric fields. Templates are not returned for the unspecified fields.

If the System/36 file (specified in the **INTO** clause) is defined by **IDDU** data definitions, the **REPLACE** clause may contain the names of the fields to be transferred, or an **\*** to transfer all fields.

If the System/36 file is not defined by **IDDU**, or you are transferring data to a library member, the **REPLACE** clause must contain an **\***.



The syntax for a REPLACE transfer request is:

```
REPLACE { *  
        { fieldname, fieldname,... } } INTO filename [ /format-name ]
```

**or:**

```
REPLACE * INTO library-name { /P  
                             /S } /member-name
```

**Notes:**

1. Braces ({} ) indicate that one of the values enclosed in the braces must be specified.
2. Square brackets ([]) indicate that the expression is optional and may be omitted.

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If the System/36 file or library member specified in the INTO clause exists and contains data, the open request will return a 0400 return code. This warns you that, if you continue to receive templates or send data, the original data in the System/36 file or library member will be replaced with the data you are sending. You can issue a close request if you want to save the data already in the file or library member.

# **Application Program Interface Example**

The following pages contain a sample program written in PASCAL. The main program is written in PASCAL and links to two subroutines written in Assembler language. This program is an example of how you can use the application program interface to create a transfer request. This program displays the names of customers who have a balance due. The balance due amounts are then added to produce the total amount due.

# Example PASCAL Program

```
Program Sample(Output);

Const
  TReq      = 'Select LSTNAM,BALDUE from CUSTCDT where BALDUE > 0'
  M1        = 'An error occurred on open';
  M2        = 'An error occurred while getting templates';
  M3        = 'An error occurred while getting records';

Type
  Buffer     = Array[1..4096] of Char; !Buffer needed by STF
  RCType    = Record                 !Return codes from STF
    Main    : Word;                 !Value returned in AX
    Second  : Word;                 !Value returned in DX
    DataLen : Integer;              !Data or message length (CX)
  End;

Var
  TRLen     : Integer;               !Transfer request length
  Buf       : Buffer;                !Transfer request buffer
  Start     : Integer;               !Starting position of data in
                                     !buffer
  RC        : RCType;                !Return codes from STF
  Name      : Lstring(255);          !Customer name
  Balance   : Real;                  !Balance due
  Total     : Real;                  !Balance due total
  NameLen   : Integer;               !Length of name field
  Ballen    : Integer;               !Length of Balance due field
  I         : Integer;               !Index counter

!-----
! Call the Application Program Interface (STF) - Assembler routine
!-----
Procedure Request ( Op      : Byte;   !Operation code
                   TRLen   : Integer; !Transfer request length
                   Var Buf  : Buffer;  !Transfer request buffer
                   Var Start : Integer; !Starting data position
                   Var RetCode : RCType); !Return codes

Extern;

!-----
! Make sure STF has been loaded - Assembler routine
!-----
Function STFFound : Boolean; Extern;
```

## Example PASCAL Program (continued)

```
!-----
! Convert a Zoned decimal field to a real number
!-----
Procedure ZoneToReal (Pos   : Integer; !Starting buffer position
                    Len   : Integer; !Field length
                    Var Num : Real); !Resulting number

Var
  C      : Integer; !Value of current buffer
          : character
  Scale  : Real;    !Power of 10 for the current
          : digit

Begin
  Scale := 0.01; !The last digit is the cents
                !position
  Num    := 0;    !Initialize the number to 0
  For I := Len DownTo 1 Do !Work backward toward start
    !of field
    Begin
      C := Ord(Buf[Pos+I-1]); !Get the byte from the buffer
      Num := Num + (C Mod 16)*Scale; !Convert the digit
      Scale := Scale * 10; !Set the scale factor
    End;
  End;

!-----
! Get the templates for each field
!-----
Procedure GetTemplates;

Begin
  Request (2,TRLen,Buf,Start,RC); !Get customer name template
  If RC.Main < #1FFF Then !Check for an error
    Begin
      NameLen := Ord(Buf[Start+1]); !Get length of name (integer)
      Name.Len := Wrd(Buf[Start+1]); !Get length of name (string)
      Request (2,TRLen,Buf,Start,RC); !Get Balance due template
      If RC.Main < #1FFF Then !Check for an error
        BalLen := Ord(Buf[Start+1]) !Get length of Balance due
      End;
    End;
  End;

!-----
! Get the data records
!-----
Procedure GetRecords;

Begin
  Repeat
    Request (3,TRLen,Buf,Start,RC); !Get the next record
    If RC.Main < #1FFF Then !Check for error or end of
      !file
      Begin
        For I := 1 To NameLen Do !Get the customer name
          Name[I] := Buf[Start+I-1];
          ZoneToReal (Start+NameLen,BalLen,Balance);
          !Get the Balance due
          Total := Total + Balance; !Total the Balance due
          WriteLn (Name,Balance:Ballen+11:2) !Print the record
        End;
      Until RC.Main >= #1FFF;
    End;
  End;
```

## Example PASCAL Program (continued)

```
!-----
! Display error status
!-----
Procedure ErrorMsg;

Begin
  WriteLn ('Main return code = ',RC.Main:4:16);
  WriteLn ('Secondary return code = ',RC.Second);
  If RC.DataLen > 0 Then
    Begin
      Write ('Message = ');
      For I := 1 to RC.DataLen Do Write (Buf[Start+I-1]);
      WriteLn
    End;
End;

!-----
! Main procedure
!-----
Begin
  If STFFound=False Then WriteLn ('STF is not loaded')
  Else Begin
    TRLen := Upper (TReq);           !Get length of statement
    UnPack (TReq,Buf,1);           !Put statement into buffer
    Request (1,TRLen,Buf,Start,RC); !Open the transfer request
    If RC.Main > 0 Then WriteLn (M1) !Check for an error
    Else Begin
      GetTemplates;                !Get the field templates
      If RC.Main > #1FFF Then       !Check for an error
        WriteLn (M2)
      Else Begin
        Write ('Customer',' ':NameLen-8); !Display column headings
        Write ('Balance Due':BalLen+11);
        WriteLn; WriteLn;
        GetRecords;                !Get the records
        If RC.Main > #1FFF Then     !Check for an error
          WriteLn (M3)
        Else Begin
          WriteLn;
          Write ('Total',' ':Namelen-5);
          WriteLn (Total:BalLen+11:2) !Display the total
        End;
      End;
    End;
  End;
  If RC.Main <> #1FFF Then
    ErrorMessage;                 !Display error status
    Request (7,TRLen,Buf,Start,RC) !Clean up
  End;
End.
```

# Assembler Language Subroutines

```
PAGE      66,132
NAME      PROCS
TITLE     Assembler routines for calling STF
PUBLIC    REQUEST,STFFOUND
;-----
; Parameters passed to the REQUEST procedure
;-----
RPARMS    STRUC
  RBP     DW      ?           ;Saved frame pointer
  RRET    DW      2 DUP(?)    ;Return address
  RRC     DW      ?           ;Return code address
  RPOS    DW      ?           ;Starting position of data
  RBUF    DW      ?           ;Buffer address
  RLEN    DW      ?           ;Statement length
  RREQ    DB      ?           ;Request code
  RREQ1   DB      ?           ;Unused byte
RPARMS    ENDS
;-----
; Return code parameter structure
;-----
RCTYPE    STRUC
  RC1     DW      ?           ;Main return code
  RC2     DW      ?           ;Secondary return code
  DLEN    DW      ?           ;Length of data (or message)
RCTYPE    ENDS
;-----
; Save the registers at the start of procedure or function
;-----
INIT      MACRO    INDICATOR
  PUSH    BP           ;Save frame pointer
  MOV     BP,SP        ;Point to parms
  IFDIF   <INDICATOR>,<'FUNCTION'>
    PUSH  AX           ;AX returns value for a function
  ENDIF
  PUSH    BX           ;Save registers
  PUSH    CX
  PUSH    DX
  PUSH    SI
  PUSH    DI
  PUSHF
  PUSH    ES
  ENDM
;-----
; Restore the registers at the start of a procedure or function
;-----
CLEANUP   MACRO    INDICATOR
  POP     ES           ;Restore registers
  POPF
  POP     DI
  POP     SI
  POP     DX
  POP     CX
  POP     BX
  IFDIF   <INDICATOR>,<'FUNCTION'>
    POP   AX           ;AX returns value for a function
  ENDIF
  POP     BP
  ENDM
```

# Assembler Language Subroutines (continued)

```

;-----
; The executable code starts here
;-----
CODE      SEGMENT 'CODE'
          ASSUME  CS:CODE
;
;
REQUEST  PROC      FAR                ;Make a request of STF
          INIT     'PROCEDURE'        ;Save registers, procedure setup
          MOV      AH,1                ;Set translation flag
          MOV      AL,[BP].RREQ        ;Set request code
          MOV      BX,[BP].RBUF        ;Set buffer address
          MOV      CX,[BP].RLEN        ;Set statement length
          MOV      DX,4096             ;Set buffer length
          DB       OCDH                ;Hex equivalent for INT instr
INTVAL   DB       060H                ;INTVAL is the interrupt at
;                                           which STF is installed
          MOV      DI,[BP].RRC        ;Get return code address
          MOV      [DI].RC1,AX         ;Store main return code
          MOV      [DI].RC2,DX         ;Store secondary return code
          MOV      [DI].DLEN,CX        ;Store length of returned data
          MOV      DI,[BP].RPOS        ;Point to caller's data pointer
          SUB      BX,[BP].RBUF        ;Set BX to offset into array
          INC      BX                   ;Set BX to array index
          MOV      [DI],BX             ;Store pointer
          CLEANUP  'PROCEDURE'        ;Restore registers
          RET      10                  ;Return
REQUEST  ENDP
;-----
; To find out if STF is loaded, look for 'STF' at offset 0103H
;-----
STFID    DB       'STF'                ;STF identifier
STFLEN   EQU      $ - STFID            ;Length of STF identifier
;
STFFOUND PROC      FAR                ;Determine if STF is loaded
          INIT     'FUNCTION'          ;Save registers, function setup
          CLD                                           ;Set direction for string comparison
          MOV      AH,35H                ;DOS function call ID -get interrupt
          MOV      AL,INTVAL             ;Initialize 1st valid interrupt to
;                                           check
NEXTINT: INT      21H                ;Get the interrupt vector from DOS
          LEA     SI,STFID              ;Offset (CS) of search string
          MOV     DI,0103H              ;Offset (ES) to be compared
          MOV     CX,STFLEN             ;Length of string comparison
;                                           Is this the STF interrupt?
          REPNE  CMPS CS:STFID[SI],ES:[DI]
          JE     FOUND                  ;Yes - jump to FOUND
          INC    INTVAL                 ;No - look at the next valid
;                                           interrupt
          MOV    AL,INTVAL              ;Set AL to the next interrupt to
;                                           check
          CMP    AL,080H                ;Was the last valid interrupt
;                                           checked?
          JB    NEXTINT                 ;No - Check the interrupt vector
          MOV    AL,0                    ;Yes - return FALSE to caller
          JMP    FEXIT                   ;Exit
FOUND:    MOV    INTVAL,AL              ;Set interrupt value to STF
;                                           interrupt
          MOV    AL,1                    ;Return TRUE to calling program
FEXIT:    CLEANUP 'FUNCTION'            ;Restore registers
          RET      10                  ;Return
STFFOUND ENDP
;
CODE      ENDS
          END

```

When this program runs, the following data records are displayed:

Customer	Balance Due
Henning	37.00
Jones	100.00
Vine	439.00
Johnson	3987.50
Stevens	58.75
Alison	10.00
Doe	250.00
Williams	25.00
Lee	489.50
Abraham	500.00
Total	5896.75

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## Return Code Summary

This chart contains a summary of the return codes that are set by STF.COM.

<b>Return Codes</b>	<b>Description</b>
0000	Previous operation was successful.
0103	Transfer request is already terminated.
0300	Untranslatable data found in transferred record.
0302	Untranslatable data in record to be transferred to System/36.
0400	Warning detected by System/36.
1FFF	End of file.
2000	Maximum number of transfer requests is active.
2001	Invalid transfer request length.
2002	Transfer request character cannot be translated.
2003	Record not transferred to System/36 because of untranslatable numeric data.
2004	Numeric data does not fit into range specified by digits.
2005	Record lengths given by CX and STF do not match.
2010	Transfer request not opened.
2011	Templates cannot be retrieved now.
2012	Cannot retrieve records on a personal computer-to-System/36 request.
2013	Cannot send records on a System/36-to-personal computer request.

<b>Return Codes</b>	<b>Description</b>
2020	Incorrect function requested.
2021	Incorrect buffer length.
2022	Incorrect buffer address.
3000	Error detected by System/36 (statement offset provided).
3100	Error detected by System/36 (no statement offset provided).
5062	Contact with System/36 is terminated.
5064	Contact with System/36 temporarily interrupted.
5066	Resource failure on System/36.
5067	Conversation has unexpectedly ended.
5068	System/36 transfer facility program not available.
5069	System/36 transfer facility program has terminated.
9999	Undefined error. Call your service representative.

For more information on the return codes set by STF.COM, refer to the *PC Support/36 Messages Guide*.

## **System/36-to-Personal Computer Performance Considerations**

The performance of transferring data from the System/36 to the personal computer depends on the following:

- How heavy the workload is on the System/36.
- The number of records that have to be looked at to complete the transfer.
- Whether multiple files are joined. Extra System/36 resources are required to join records from more than one file.

A transfer request containing a JOIN BY clause can be optimized as long as:

- You specify a JOIN condition using only =.

# Transfer Facility Incompatibilities

Although the System/36-to-personal computer transfer facility portion of PC Support/36 is designed to be as compatible as possible with the IBM System/36 Transfer Facility PRPQ, some changes have been made. If you previously used the IBM System/36 Transfer Facility PRPQ and intend to use the transfer requests you created with that product, you should be aware of these changes.

*Note: The record-indicator is the same as the format-name.*

- The format of the FROM clause differs between the two products.
  - The format used in the IBM System/36 Transfer Facility PRPQ is as follows:

**FROM file-definition[(file-name)] [/record-indicator]**

- The format used in PC Support/36 System/36-to-personal computer transfer facility is:

**FROM file-name[/format-name]**

PC Support/36 cannot accept a FROM clause specified in the format used for the IBM System/36 Transfer Facility PRPQ. You will need to change the FROM clause to follow the new format.

- The format of **EXTRACT COLUMNS** differs between the two products.
  - The format used in the IBM System/36 Transfer Facility PRPQ is as follows:

**EXTRACT COLUMNS file-definition[(file-name)]  
[/record-indicator]**

- The format used in PC Support/36 System/36-to-personal computer transfer facility is:

**EXTRACT COLUMNS file-name[/format-name]**

- The format of **EXTRACT TABLES** differs between the two products.
  - The format used in the IBM System/36 Transfer Facility PRPQ is as follows:

**EXTRACT TABLES file-definition[(file-name)]**

- The format used in PC Support/36 System/36-to-personal computer transfer facility is:

**EXTRACT TABLES file-name**

- The maximum length of a transfer request is 1800 characters for the IBM System/36 Transfer Facility PRPQ; it is 4093 characters for the PC Support/36 transfer facility.

- The message identification code for System/36 messages is no longer passed in register AX as the return code. Instead, this message identification code is a part of the System/36 message text.

Register AX contains a return code generated by the STF.COM program. This change affects you only if you have written a program that checks for particular error message identification codes from the System/36. If this is the case, you will have to change your program to check for the message identification codes within the message text rather than in register AX.

This message identification code is in ASCII and occupies the fifth through the eighth character positions in the message text.

- In the IBM System/36 Transfer Facility PRPQ, the System/36 sign-on display is automatically displayed when you send a transfer request to the System/36 and you have not previously signed on. If you are using PC Support/36 and you try to send a transfer request to the System/36 before you have signed on, an error occurs. To recover from this error, you must end your application and run the STARTRTR program, then restart your application.
- If your application program does not end your transfer request, files are not closed for you when your program ends, as they are for the IBM System/36 Transfer Facility PRPQ.

(

# Chapter 7. The Translation Table Utility

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# Introduction

Because the System/36 uses primarily EBCDIC data and the personal computer uses primarily ASCII data, the data must be translated when it is transferred to and from the personal computer.

*Note: DisplayWrite 2 and DisplayWrite 3 internal documents, and the FFT version are in EBCDIC.*

PC Support/36 uses default translation tables to translate the data from EBCDIC to ASCII and from ASCII to EBCDIC. However, your needs may require you to create your own translation tables.

For example:

- The personal computer keyboard does not have certain characters that are available on the System/36 keyboard. You could create a translation table to substitute an unused character on the personal computer keyboard for the System/36 character. This substitution would be done when the character is sent in a file to the System/36.
- Different printer belts may have different character definitions for the same system. You could create your own translation tables to compensate for this difference.

*Note: If you plan to use the System/36 PC utility, you should use that utility to make the same changes to the translation tables as you do using the translation table utility. This will ensure consistency among the PC Support/36 programs. For details, refer to Chapter 8, "System/36 PC Utility."*

Once you have defined a new translation table using the translation table utility, you must specify the table to replace the default PC Support/36 table in the CONFIG.S36 file. The tables you can replace with your own are:

- **A2ET:** Specifies the table to be used to translate data from ASCII to EBCDIC before it is sent to the System/36, except for printer data.
- **E2AT:** Specifies the table to be used to translate data from EBCDIC to ASCII after it is received from the System/36.
- **AEP1:** Used by the VPRT.COM program to translate characters from ASCII to EBCDIC that are to be sent to the System/36 printer designated as LPT1.
- **AEP2:** Used by the VPRT.COM program to translate characters from ASCII to EBCDIC that are to be sent to the System/36 printer designated as LPT2.
- **AEP3:** Used by the VPRT.COM program to translate characters from ASCII to EBCDIC that are to be sent to the System/36 printer designated as LPT3.

For more details on what you can specify in the CONFIG.S36 file, refer to Chapter 2, “The PC Support/36 Configuration File.”

You can use the translation table utility to do any of the following:

- Create a new ASCII to EBCDIC or EBCDIC to ASCII translation table based on the tables provided with PC Support/36
- Modify an existing translation table
- Print a translation table

You can also copy, rename, and erase translation tables using the DOS COPY, RENAME, and ERASE commands.

### **CAUTION**

**You should be especially careful when changing the default translation tables used by PC Support/36, because this can cause you to lose data, or make PC Support/36 difficult or impossible to use.**

For example:

- The PC Support/36 translation for the ASCII *w* is an EBCDIC *w*. If you change this translation, you can no longer use the WHERE clause when creating a transfer request.
- If you change the translation of any alphabetic character, numeric character, or some of the special symbols, you may receive messages from the System/36 that you cannot read.

# Starting the Translation Table Utility

You can start the translation table utility one of two ways:

- Without specifying a file name, to create a new translation table
- With a file name, to modify an existing translation table

## Starting the Translation Table Utility without a File Name

To start the translation table utility without specifying a file name, type:

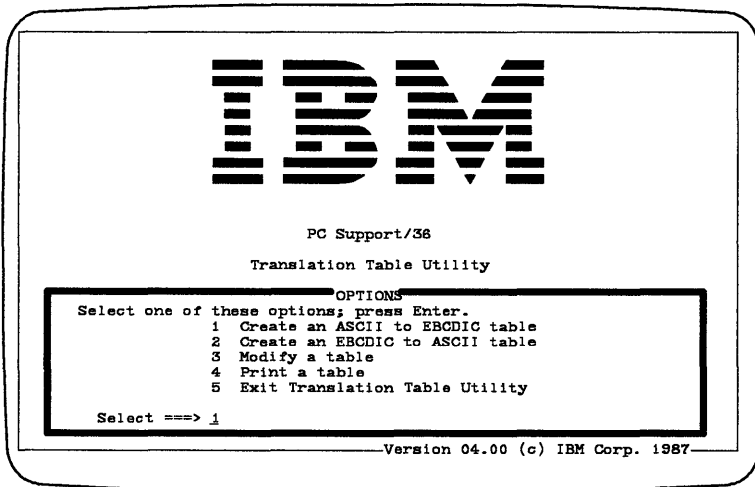
**TRTABLE [/x][/y]**

where:

**/x** specifies what kind of display you are using. This parameter applies only if you are using a graphics adapter card. If you are using a Monochrome Display and Printer Adapter, this parameter is ignored. You can specify an uppercase or lowercase M for a monochrome display or an uppercase or lowercase C for a color display. For details, refer to the chapter entitled “What You Should Know before Operating PC Support/36” in the *PC Support/36 User's Guide*.

/y specifies high speed or slow speed display writing. You can specify an uppercase or lowercase H for high speed display writing or an uppercase or lowercase S for slow speed display writing. High speed display writing may cause random dashes or snow to appear on the screen with some graphics adapters. If you do not specify a value for this parameter, slow speed display writing will be used with all adapters except the Enhanced Graphics Adapter. For details, refer to the chapter entitled "What You Should Know before Operating PC Support/36" in the *PC Support/36 User's Guide*.

Press the Enter key. The following display appears:



S9097701-4

From this display you can create, modify, or print a translation table, or you can end the translation table utility. Each of these options is described in detail later in this chapter.

# Starting the Translation Table Utility with a File Name

If you want to specify the name of a file containing an existing translation table when starting the translation table utility, type:

```
TRTABLE [d:][path]filename.ext ][/x][/y]
```

where:

**d:** specifies the disk drive.

**path** specifies a path of directory names.

***filename*** specifies the name of a personal computer file that contains the existing translation table.

**.ext** specifies the file name extension.

If you did not specify an extension, the default extension, .TBL, is used. This extension is provided to help you identify the file as one created by the translation table utility.

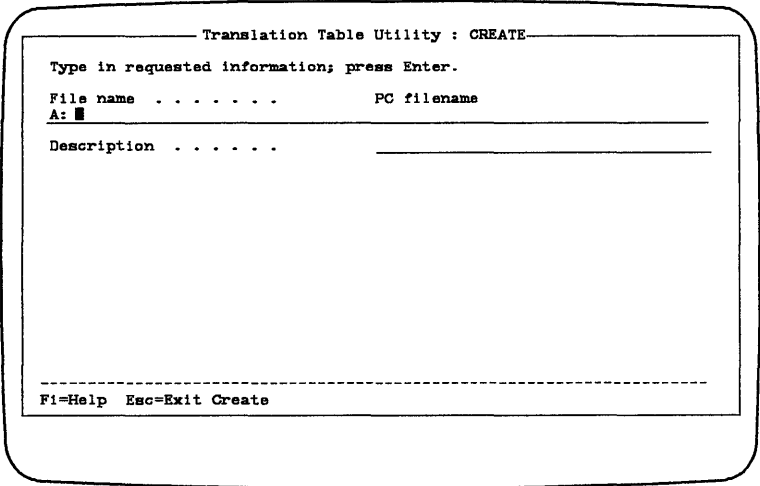
**/x** specifies what kind of display you are using. This parameter applies only if you are using a graphics adapter card. If you are using a Monochrome Display and Printer Adapter, this parameter is ignored. You can specify an uppercase or lowercase M for a monochrome display or an uppercase or lowercase C for a color display. If you do not specify a value for this parameter, C is assumed.

`/y` specifies high-speed or slow-speed display writing. You can specify an uppercase or lowercase `H` for high-speed display writing or an uppercase or lowercase `S` for slow-speed display writing. High-speed display writing may cause random dashes, or snow, to appear on the screen with some graphics adapters. If you do not specify a value for this parameter, slow-speed display writing will be used with all graphics adapters except the Enhanced Graphics Adapter.

After you type the `TRTABLE` command, press the Enter key. The `MODIFY` display appears. Refer to “Modifying a Translation Table” for more information.

# Creating a Translation Table

If you want to create a translation table, select option 1 (Create an ASCII to EBCDIC table) or 2 (Create an EBCDIC to ASCII table) in the OPTIONS menu and press the Enter key. The following display appears:



S9097702-0

## File name

Type the name of the file you want to create in the File name input area. If you want to specify the drive and path information, you must type it in the input area using the following format:

**[d:][path]filename [.ext|.TBL]**

where:

**d:** specifies the disk drive.

**path** specifies a path of directory names.

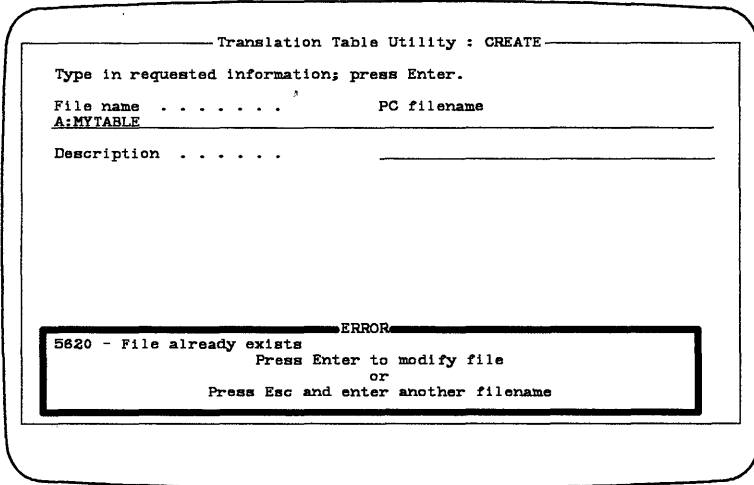


**filename** specifies the name of a personal computer file to contain the translation table.

**.ext|.TBL** specifies the file name extension. You can use either an extension of your own or the default extension, **.TBL**. You can specify only one extension; the or bar (|) means you can specify one or the other.

When you have completed the File name prompt, press the Enter key.

If a file already exists by the name you entered, the following message is displayed:



S9097703-0

From this display, you can either press the Enter key to modify the table or press the Escape key if you do not want to modify the table.

If you press the Enter key, you can modify the translation table. Refer to "Modifying a Translation Table" later in this chapter for details on how to modify this table.

If you press the Escape key, the cursor is returned to the File name prompt. You can then type another file name.

If the file name you entered is new, you should enter a description in the Description prompt.

## Description

The Description prompt allows you to type a description to be saved with the translation table. This prompt is optional. You can type a short description of the translation table in the input area and press the Enter key.

If you chose option 1 in the OPTIONS menu (Create an ASCII to EBCDIC translation table), the display shows the default ASCII to EBCDIC translation table, as follows:

Translation Table Utility : CREATE  
First Hexadecimal Digit

Second Hexadecimal Digit	00	01	02	03	04	05	06	07	08	09	A	B	C	D	E	F
00	00	00	40	F0	7C	D7	79	97	88	71	45	00	00	00	00	00
1	00	00	5A	F1	C1	D8	81	98	DC	9C	55	00	00	00	59	8F
2	00	00	7F	F2	C2	D9	82	99	51	9E	CE	00	00	00	00	DA
3	00	00	7B	F3	C3	E2	83	A2	42	CB	DE	4F	00	00	00	8D
4	00	00	B8	5B	F4	C4	E3	84	A3	43	CC	49	00	00	00	00
5	00	00	B5	8C	F5	C5	E4	85	A4	44	CD	89	00	00	00	00
6	00	00	50	F6	C6	E5	86	A5	47	DB	9A	00	00	00	A0	00
7	00	00	7D	F7	C7	E6	87	A8	48	DD	9B	00	00	-00	00	00
8	00	00	4D	F8	C8	E7	88	A7	52	DF	AB	00	00	00	00	30
9	00	00	5D	F9	C9	E8	89	A8	53	EC	00	00	00	00	00	00
A	00	00	5C	7A	D1	E9	91	A9	54	FC	5F	00	00	00	00	00
B	00	00	4E	5E	D2	00	32	C0	57	4A	B8	00	00	00	00	00
C	00	00	8B	4C	D3	E0	33	6A	56	B1	B7	00	00	00	00	00
D	00	00	80	7E	D4	00	34	D0	58	B2	AA	00	00	00	80	EA
E	00	00	4B	8E	D5	00	35	A1	63	B3	8A	00	00	00	00	00
F	9F	00	61	8F	D6	6D	36	00	87	B4	8B	00	00	00	00	00

-----  
F1=Help F4=Save Esc=Exit Create

S9097704-0

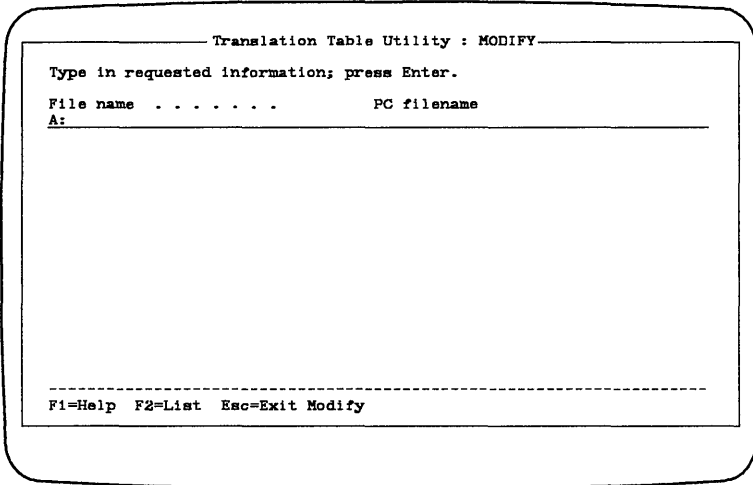
If you chose option 2 in the OPTIONS menu (Create an EBCDIC to ASCII translation table), the display would show the default EBCDIC to ASCII translation table that PC Support/36 uses.

You can use these tables as guides in creating new translation tables. You can change any of the entries in these tables using the procedures described in “Modifying a Translation Table.”

When you have completed the translation table, you can save it by pressing the F4 (Save) key. If you do not want to save the table, you can press the Escape key to return to the OPTIONS menu.

# Modifying a Translation Table

If you want to modify an existing translation table, select option 3 (Modify a table) in the OPTIONS menu. The following display appears:

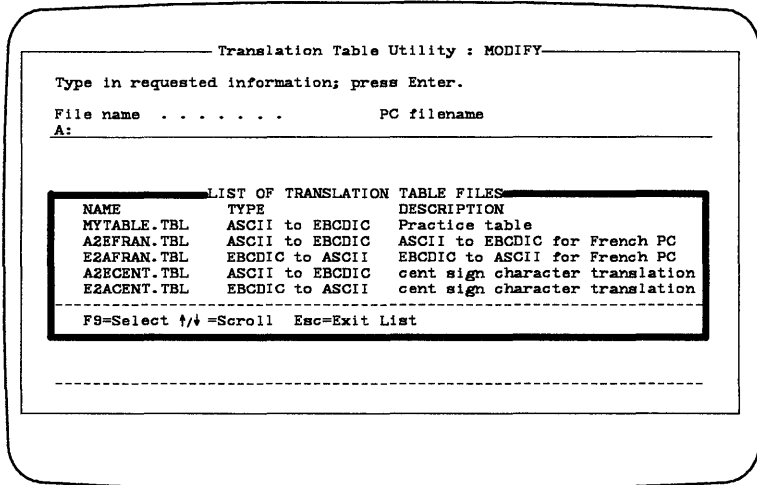


S9097705-0

## File name

Type the name of the translation table file you want to modify in the File name input area. If you do not know the name of the translation table you want to modify, you can press the F2 key.

Pressing the F2 key while the File name input area is blank displays a list of all of the translation table files with the extension .TBL, as follows:



S9097706-0

If a drive letter is specified in the File name prompt, pressing the F2 key lists all of the translation table files with the extension .TBL on the specified disk drive. If the table you want to modify does not appear in the list, you can change the drive letter specified in the File name input area, press the Escape key to end the list, and press the F2 key again.

To list all of the translation table files with any possible extension, you can type \*.\* in the File name input area and press the F2 key.

To select a file name from the list, use the Up Arrow and Down Arrow keys to find the line you want, then press the F9 key. The file name is automatically copied into the File name input area.

After you complete the File name prompt and press the Enter key, the Description prompt appears as follows:

```
----- Translation Table Utility : MODIFY -----  
Type in requested information; press Enter.  
File name . . . . . PC filename  
A:MYTABLE  
-----  
Description . . . . . Practice table_____  
  
-----  
F1=Help  Esc=Exit  Modify
```

S9097707-0

## Description

You can make any changes you wish to the description by typing over the existing information. The Description prompt is optional. After you have completed the Description prompt, press the Enter key. The translation table is displayed as follows:

Translation Table Utility : MODIFY  
First Hexadecimal Digit

ASCII to EBCDIC  
MYFILE.TBL

	00	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
Second Hexadecimal Digit	00	00	00	40	F0	7C	D7	79	97	68	71	45	00	00	00	00
1	00	00	5A	F1	C1	D8	81	98	DC	9C	5E	00	00	00	59	8F
2	00	00	7F	F2	C2	D9	82	99	51	9E	CE	00	00	00	00	DA
3	00	00	7B	F3	C3	E2	83	A2	42	CB	DE	4F	00	00	00	8D
4	00	B6	5B	F4	C4	E3	84	A3	43	CC	49	00	00	00	00	00
5	00	B5	6C	F5	C5	E4	85	A4	44	CD	69	00	00	00	00	00
6	00	00	59	F6	C6	E5	86	A5	45	DD	9A	00	00	00	00	00
7	00	00	7D	F7	C7	E6	87	A6	46	DB	9A	00	00	00	00	00
8	00	00	4D	F8	C8	E7	88	A7	52	DF	AB	00	00	00	00	80
9	00	00	5D	F9	C9	E8	89	A8	53	EC	00	00	00	00	00	00
A	00	00	5C	7A	D1	E9	81	A9	54	FC	5F	00	00	00	00	00
B	00	00	4E	5E	D2	00	82	C0	57	4A	B8	00	00	00	00	00
C	00	00	8B	4C	D3	E0	83	6A	56	B1	B7	00	00	00	00	00
D	00	00	80	7E	D4	00	94	D0	58	B2	AA	00	00	00	80	EA
E	00	00	4B	8E	D5	00	95	A1	63	B3	8A	00	00	00	00	00
F	9F	00	81	8F	D6	8D	96	00	87	B4	8B	00	00	00	00	00

-----  
F1=Help F4=Save Esc=Exit Modify

S9097708-0

The numbers in the headings on the table label the rows and columns. To modify the table, use the cursor movement keys to position the cursor to the row and column you want to modify.

The cursor automatically moves down to the next field in the column when you type the second character in a field or press the Enter key. If the cursor is in the last field in a column, it automatically moves to the first position of the next column.

You can type only characters 0 through 9 and A through F. Alphabetic characters typed in lowercase are automatically changed to uppercase.

If you are working with an ASCII to EBCDIC table, the position in the table represents the ASCII character, while the entry at that position represents the corresponding EBCDIC character. For example, if you wanted all occurrences of the backspace character (hexadecimal 08 in ASCII) in a file that you are sending to a virtual printer to be printed as asterisks, you would enter the EBCDIC value for an asterisk (hexadecimal 5C in EBCDIC) at position 08 of an ASCII to EBCDIC table. This table would then be used with either the AEP1, AEP2, or AEP3 entry in the configuration file (CONFIG.S36) for the LPT1, LPT2, or LPT3 printer, respectively.

The reverse is true for modifying the EBCDIC to ASCII table. To change an EBCDIC to ASCII translation table, find the position of the EBCDIC character that you wish to translate and enter the ASCII value for the ASCII character to which you want the character translated.



Do not change values between hexadecimal 01 and hexadecimal 3F for an ASCII to EBCDIC table that you plan to use with the PC Support/36 configuration file entries AEP1, AEP2, and AEP3.

You can press the F1 key at any time to display help text.

When you are finished modifying the table, press the F4 (Save) key. This saves the changes you made in the file. After the translation table is saved, the following display appears:

```
-----Translation Table Utility-----
Type in requested information; press Enter.
File name . . . . . PC filename
A: _____

-----OPTIONS-----
Select one of these options; press Enter.
 1 Create an ASCII to EBCDIC table
 2 Create an EBCDIC to ASCII table
 3 Modify a table
 4 Print a table
 5 Exit Translation Table Utility

Select ==> 1
```

S9097709-0

*Note: You can press the Escape key at any time to return to the OPTIONS menu. If you press the Escape key before you press the F4 (Save) key, a warning message is displayed giving you a chance to save the modified translation table. If you do not save the table, any changes you made are lost.*

# Printing a Translation Table

If you want to print a translation table, select option 4 (Print a table) on the OPTIONS menu. The following display appears:

```
----- Translation Table Utility : PRINT -----
Type in requested information; press Enter.
File name . . . . . PC filename
A:█
-----
Printer Setup:
Length of print line . . . . . 80 80, 132 characters
Number of lines per page . . . . . 66 1 - 127 lines

-----
F1=Help F2=List Esc=Exit Print
```

S9097710-0

## File name

Type the name of the file you want to print in the File name input area in the following format:

**[d:][path]*filename* [.ext|.TBL]**

where:

**d:** specifies the disk drive.

**path** specifies a path of directory names.

***filename*** specifies the name of a personal computer file to contain the translation table.

**.ext|.TBL** specifies the file name extension. You can use either an extension of your own or the default extension, **.TBL**. You can specify only one extension; the or bar (|) means you can specify one or the other.

When you have completed the File name prompt, press the Enter key.

### **Length of print line**

Use this prompt to specify the length of the lines to be printed. You can enter either 80 or 132. When you have completed this prompt, press the Enter key.

### **Number of lines per page**

Use this prompt to specify the number of lines to be printed per page. You can enter any number from 1 through 127. When you have completed this prompt, press the Enter key.

The translation table is now printing. You can stop printing and return to the OPTIONS menu at any time by pressing the Escape key. The following is an example of what the printed table should look like:

```

Translation Table Utility

File name . . . . . SAMPLE.TBL
Description . . . . . Sample translation table
Type of table . . . . . ASCII to EBCDIC

                First Hexadecimal Digit
Second
Hexadecimal   0  1  2  3  4  5  6  7  8  9  A  B  C  D  E  F
Digit
0  00 00 40 F0 7C D7 79 37 68 71 45 00 00 00 00
1  00 00 5A F1 C1 D8 81 98 DC 9C 55 00 00 00 59 8F
2  00 00 7F F2 C2 D9 82 99 51 9E CE 00 00 00 00 DA
3  00 00 7B F3 C3 E2 83 A2 42 CB DE 4F 00 00 00 8D
4  00 B8 5B F4 C4 E3 84 A3 43 CC 49 00 00 00 00 00
5  00 B5 8C F5 C5 E4 85 A4 44 CD 89 00 00 00 00 00
6  00 00 50 F6 C6 E5 86 A5 47 DB 9A 00 00 00 A0 00
7  00 00 7D F7 C7 E6 87 A6 48 DD 9B 00 00 00 00 00
8  00 00 4D F8 C8 E7 88 A7 52 DF AB 00 00 00 00 90
9  00 00 5D F9 C9 E8 89 A8 53 EC 00 00 00 00 00 00
A  00 00 5C 7A D1 E9 91 A9 54 FC 5F 00 00 00 00 00
B  00 00 4E 5E D2 00 92 C0 57 4A B8 00 00 00 00 00
C  00 00 8B 4C D3 E0 93 6A 56 B1 B7 00 00 00 00 00
D  00 00 80 7E D4 00 94 D0 58 B2 AA 00 00 00 80 EA
E  00 00 4B 6E D5 00 95 A1 63 B3 8A 00 00 00 00 00
F  9F 00 61 6F D6 6D 96 00 67 B4 8B 00 00 00 00 00

```

S9097204-1

*Note: Translation tables are printed on the printer you designated as LPT1. If LPT1 is a virtual printer, the printed translation table may not match the displayed translation table because the table is translated from ASCII to EBCDIC when it is printed on the virtual printer.*

# Ending the Translation Table Utility

To end the translation table utility, select option 5 (Exit translation table utility) in the OPTIONS menu. This ends the translation table utility and returns the DOS prompt.

## Copying, Renaming, and Erasing Translation Tables

After you have created a translation table, you can use the DOS COPY, RENAME, and ERASE commands to copy, rename, and erase translation tables. For these commands, you specify the name of the translation table using the standard DOS file naming conventions, just as you did for the TRTABLE command. (Refer to “Starting the Translation Table Utility without a File Name” earlier in this chapter.)

### Copying a Translation Table

You might want to create a new translation table from a translation table you previously created. To do this, you can use the DOS COPY command, as follows:

```
COPY oldtable newtable
```

where **oldtable** is the name of the translation table you previously created and **newtable** is the name of the table you want to create.

## **Renaming a Translation Table**

You can rename an existing translation table using the DOS RENAME command, as follows:

**RENAME oldname newname**

where **oldname** is the previous name of the translation table and **newname** is the new name.

## **Erasing a Translation Table**

If you no longer want to use an existing translation table, you can erase it using the DOS ERASE command, as follows:

**ERASE oldtable**

where **oldtable** is the name of the existing translation table that you want to erase.

(

)

# Chapter 8. System/36 PC Utility

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# PC Utility Introduction

A *virtual disk* is created by PC Support/36 and varies in size from 5K to 32765K bytes.

A *virtual diskette* is created by the File Support utility PRPQ, and its size can be 160K, 180K, 320K, or 360K bytes.

The System/36 PC utility enables you to:

- Work with shared folders and documents.
- Copy virtual disk files to a shared folder.
- Create and delete virtual disks.
- Copy library members and files to and from virtual disks or diskettes.

The PC utility gives you better performance when working with virtual disk and diskettes, especially if you are using a remote display station. You can run this utility from any System/36 display station, or from a personal computer in 5250 emulation mode.

In this chapter, the term *virtual disk* means virtual disk *or* virtual diskette except in the Create Virtual Disk or Delete Virtual Disk functions. These two functions apply only to virtual disks; they do not apply to virtual diskettes.

The PC utility supports the following functions:

- Copy personal computer files stored on a virtual disk to a shared folder
- Create and delete a virtual disk
- Copy System/36 files and library source and procedure members to a personal computer file stored on a virtual disk, and optionally translate characters from EBCDIC to ASCII
- Copy personal computer files stored on a virtual disk to a System/36 file or library source or procedure member, and optionally translate characters from ASCII to EBCDIC
- Copy personal computer files stored on a virtual disk to other personal computer files stored on the same or a different virtual disk
- Copy personal computer files to a DisplayWrite/36 document (if DisplayWrite/36 is supported)
- Copy a DisplayWrite/36 document to a personal computer file (if DisplayWrite/36 is supported)
- Modify the ASCII to EBCDIC translation table
- Modify the EBCDIC to ASCII translation table

You can create as many virtual disks as you want. Several users can read from a virtual disk, but only one user at a time can update a virtual disk.

You can use the System/36 PC utility to access a System/36 file or library source or procedure member from a personal computer. To do this, you must create or use an existing virtual disk, and copy the System/36 file or library member to the virtual disk.

The personal computer uses ASCII data format; System/36 uses EBCDIC data format. The PC utility converts your data into the acceptable format. However, not all data can be converted character for character.

The PC utility lets you specify whether you want to translate data and, if so, what you want done when a character cannot be converted. You can specify that you want processing to stop, or that you want another character substituted for the untranslatable character.

# Help Text and Lists

The PC utility provides online help text. To display the help text for a particular display, press the Help key.

If DisplayWrite/36 is installed, you can display a list of personal computer files on virtual disks or a list of virtual disks. (Virtual diskettes created by the File Support utility cannot be listed.) If a list can be displayed for a particular prompt, instructions appear to the right of the prompt, telling you how to display the list.

## PC Utility Considerations

The System/36 PC utility is designed to operate on any System/36. You need to consider the following items when using the PC utility:

- The number of virtual disks that can be created is limited only by the amount of System/36 disk storage. Each virtual disk can be from 5K bytes to 32765K bytes.
- The PC utility allows you to access only one virtual disk at a time, except when copying from a virtual disk to another virtual disk.
- The names you assign your personal computer files must be valid personal computer file names. However, virtual disks, files and library source and procedure members created from personal computer files must have valid System/36 names.

# File Copy Considerations

You need to consider the following items when you use the copy file options provided by the PC utility:

- The PC utility is designed to handle System/36 files with maximum record lengths of 4096-bytes and library source or procedure members with record lengths of 40 to 120 bytes.
- Files copied from a System/36 file or library source or procedure member to a virtual disk with character translation are converted from fixed-length format to variable-length format. A carriage return and line feed character delimit each record. The carriage return and line feed characters are placed after the last nonblank character in the record.
- Files copied from a virtual disk to a System/36 file or library source or procedure member with character translation are converted from variable-length format to fixed-length format. When a personal computer record does not completely fill a System/36 record, the System/36 record is padded with blanks. Line feed characters and carriage returns are ignored and are not copied. When a personal computer record is longer than a System/36 record, more than one System/36 record is created.

- When adding to a System/36 file, the System/36 file will automatically be extended, if necessary, to contain all of the input records.
- Translation of data should be limited to files containing characters only. Refer to Chapter 6, "The Transfer Facility," for valid characters.
- Numeric data should be converted to a format acceptable to the system receiving the copied data. The PC utility converts numeric character data but does not convert numeric format data (such as packed decimal, binary integer, and floating point).

# Working with IBM Personal Computers

The command you use to get the Work with IBM Personal Computer display is PCU or PCMENU. If you are not familiar with the PC utility commands and parameters, type:

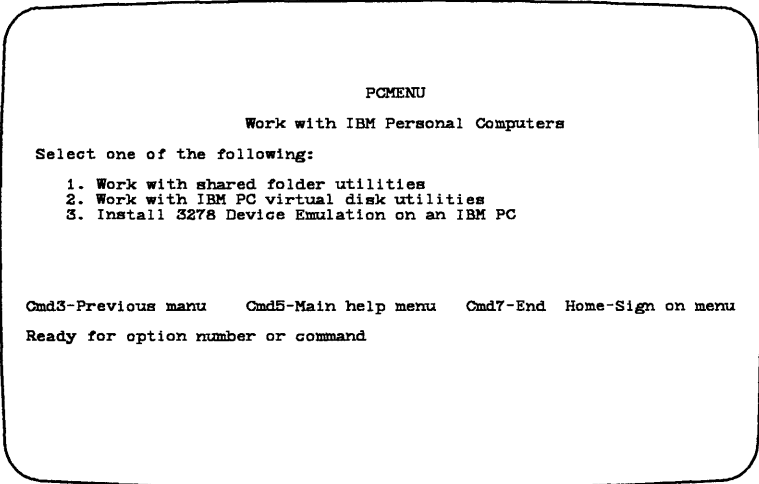
## PCU

on the System/36 Command display and press the Enter key, or type:

## PCMENU

on the System/36 Command display, and press the Help key.

The Work with IBM Personal Computer display appears as follows:



S9097801-2



From this display, you can type the number of the option you want and press the Enter key.

If you are familiar with the PC utility commands but not the parameters, you can simply type on the System/36 Command display the command you want to use and press the Enter key. A display for the command you entered then appears.

## Copying a Virtual Disk File to a Shared Folder

To copy a virtual disk file to a shared folder, type:

**PCMENU**

on the display and press the Help key. The PCMENU display appears as follows:

```

                                PCMENU
                                Work with IBM Personal Computers

Select one of the following:
  1. Work with shared folder utilities
  2. Work with IBM PC virtual disk utilities
  3. Install 3278 Device Emulation on an IBM PC

Cmd3-Previous manu   Cmd5-Main help menu   Cmd7-End   Home-Sign on menu
Ready for option number or command
```

S9097801-2

On this display, select option 1 and press the Enter key.

Selecting this option is the same as if you typed the following:

## **PCU SHRFLDR**

on the System/36 Command display and pressed the Enter key, or typed:

## **FLDRUTIL**

on the System/36 Command display and pressed the Help key.

The FLDRUTIL menu appears as follows:

```

                                FLDRUTIL
                                Work with shared folder utilities
Select one of the following:
    1. Work with shared folders
    2. Work with documents
    3. Copy a virtual disk to a folder

Cmd3-Previous menu  Cmd5-Main help menu  Cmd7-End  Home-Sign on menu
Ready for option number or command
1
```

S9097802-1

On this display, select option 3 and press the Enter key.

Selecting option 3 is the same as if you entered the following:

## **PCU SHRFLDR, DISKCOPY**

For information on options 1 and 2, refer to the *System/36 System Reference* manual.

The Copy Virtual Disk Files to Folder display appears as follows:

```

                                COPY VIRTUAL DISK FILES TO FOLDER
Type choices, press Enter.
ITEM          CHOICE    POSSIBLE CHOICES
Disk or diskette name . . . . .
Folder name . . . . .      Blank for list of disks
Replace existing
  folder members. . . . 2    1=Yes      2=No

Cmd3=Go Back          Cmd7=End
```

S9097803-1

Responding to the prompts on this display is the same as if you typed the following on the System/36 Command display:

**PCU SHRFLDR, DISKCOPY, [disk/diskette name],  
[folder name],  
[NOREPLACE/REPLACE]**

*Note: The folder name you specify must be the name of an existing folder.*

The following table shows the commands and parameters to copy virtual disk files to a shared folder. Items shown in bold are the default parameter values. More details on these parameters appear later in this chapter.

<b>Procedure</b>	<b>Opt Nbr</b>	<b>Procedure Command</b>
Copy virtual disk files to a shared folder	3	PCU SHRFLDR, DISKCOPY, disk/diskette name, folder name, NOREPLACE/REPLACE

### **Disk or diskette name**

Enter the name of the virtual disk that you wish to copy. All of the files within the virtual disk will be copied to the shared folder.

*Note: Files with the extension of .PRF cannot be copied to a shared folder.*

Select a disk from the display and return to the Copy Virtual Disk to Folder display. Only one disk can be selected at a time. If you leave this prompt blank and press the Enter key, the Select Disk display is shown as follows:

```

                                SELECT DISK
Type choice, press Enter.
ITEM                               CHOICE
Disk name . . . . .
                                LIST OF PERSONAL COMPUTER DISKS
                                ALL
Or select one disk using option '1', press Enter
OPTION  NAME      DESCRIPTION      SIZE  FILES  DATE
#IWPCLD2
DW4      DW4 code                    2000   112  5/28/88
FS       PC Folder Support Programs & Tools  360    112  5/02/88
PCO      PC Support/38 Organizer          360    112  6/01/88
PCUDISK
PJF      10                               10     16  6/17/88
        600                               600    112  5/30/88

Cmd3=Go back      Cmd7=End      Cmd8=Reset      Roll=Page

```

S9097805-0

*Note: Your display may not appear exactly as the one previously shown in this manual. The disk names that appear on your display will be the names of disks on your system.*

## Folder name

Enter the name of the existing shared folder you want to use. When you select a folder from the list, the Copy Virtual Disk to Folder display returns. If you leave this prompt blank and press the Enter key, the DisplayWrite/36 Select Folder display appears as follows:

```

                                         SELECT FOLDER
Type choice, press Enter.
ITEM                                     CHOICE
Folder name . . . . .
Position last to. . . . . Starting characters(s) of name
                                         LIST OF FOLDERS
Or select folder using option '1'. press Enter.
OPTION  NAME      DESCRIPTION      CREATED
#IDDFLDR  IDDU Online Information  02/18/86
#WPFLLDR  DW/36 ONLINE INFORMATION  02/18/86
A         A         07/02/86
AAA      AAA         06/24/86
AAAABBBB First 11/cloned Folder      / /
AJI      AJI         06/28/86
AJIFLDR  Al's Folder created 8/16/86 06/16/86
AJITXT   AJITXT      06/22/86
AL       AL         06/22/86
BARTEST  BARTEST     06/12/86
BC       BC         First 11/cloned Folder      / /

Cmd3=Go back      Cmd6=Print list
Cmd7=End          Cmd8=Reset      Roll=Page
```

S9097806-0

### Notes:

1. *Your display may not appear exactly as the previous display. The folder names that appear on your display will be the names of folders on your system.*
2. *If you leave either of the preceding prompts blank and list support is not available on your System/36, an error message is displayed.*

## **Replace existing document**

If you wish to replace an existing document in a folder with the specified virtual disk file, enter a 1 for this prompt. If you do not want to replace an existing folder, enter a 2 for this prompt. If you do not specify a value for this prompt, 2 is assumed.

If you select option 2 and another folder exists with the same name, an error message is displayed and the virtual disk file is not copied.

After you press the Enter key and the System/36 has finished processing your command, you will receive a message telling you that the disk was successfully copied.

You can then do one of the following:

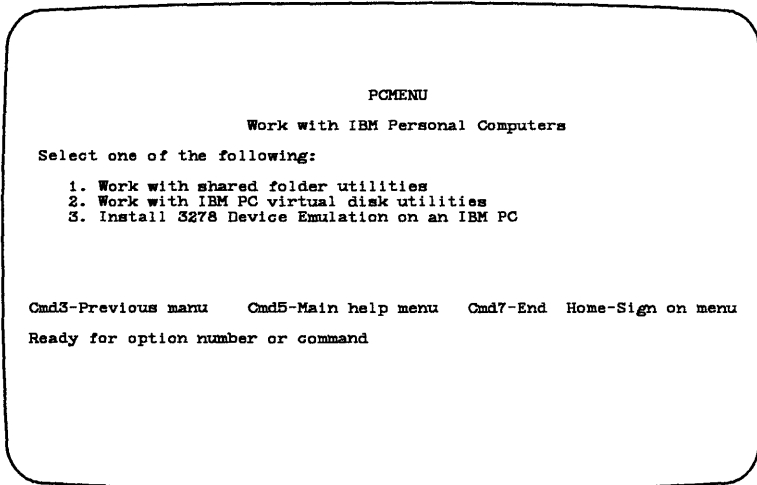
- Copy another virtual disk file to a shared folder.
- Press command key 7 to end the PC utility.
- Press command key 3 to go back to the previous display.

# Working with IBM Virtual Disk Utilities

The command you enter to use the PC utility is PCU. If you are not familiar with the PC utility commands and parameters, type:

## PCU

on the System/36 Command display and press the Enter key. The Work with IBM Personal Computer display appears as follows:



S9097801-2

On this display, select option 2 and press the Enter key.



The PC Virtual Disk Utilities display appears as follows:

```
                                WORK WITH IBM PC VIRTUAL DISK UTILITIES
-----
Type choice, press Enter.

  1) Create a virtual disk
  2) Delete a virtual disk

  3) Copy a virtual disk file to another virtual disk

  4) Copy a virtual disk file to a S/38 file
  5) Copy a S/38 file to a virtual disk file

  6) Copy a virtual disk file to a S/38 library member
  7) Copy a S/38 library member to a virtual disk file

  8) Copy a virtual disk file to a DW/38 document
  9) Copy a DW/38 document to a virtual disk file

Option: █

Cmd7=End                                (C) Copyright IBM Corp 1987
```

S9097101-3

Selecting option 2 is the same as if you typed the following on the System/36 Command display and pressed the Enter key:

**PCU VIRTDISK**

For example, if you type:

## PCU ,CREATE

to create a virtual disk and press the Enter key, the following Create Virtual Disk display appears:

**CREATE VIRTUAL DISK**

---

Type choices, press Enter.

ITEM	CHOICE	POSSIBLE CHOICES
Disk name . . . . .	_____	Valid S/36 file label
Disk size . . . . .	_____	5 - 32765 kilobytes
Directory size. . . . .	_____	16 - 2048 entries
Optional description. . . . .	_____	

---

Cmd3-Go back                      Cmd7-End

S9088102-1

You can also type the command and the necessary parameters on the System/36 Command display. When you press the Enter key, the System/36 automatically performs the command you entered, and you are not prompted for more information.

The following table shows the PC utility commands and parameters. Items shown in bold are the default parameter values. More details on these parameters appear later in this chapter.

<b>Procedure</b>	<b>Opt Nbr</b>	<b>PCU Procedure Command</b>
Create a virtual disk	1	PCU ,CREATE, virtual disk name, disk size, maximum directory entries, '40 character description'
Delete a virtual disk	2	PCU ,DELETE, virtual disk name
Copy a virtual disk file to another virtual disk	3	PCU ,DISKDISK, input PC file name, input virtual disk name, input access path, output PC file name, output virtual disk name, output access path, <b>CREATE/REPLACE, NOREADONLY/READONLY, EXCLUSIVE/SHARE</b>
Copy a virtual disk file to a S/36 file	4	PCU ,DISKFILE, PC file name, virtual disk name, access path, S/36 file name, <b>CREATE/ADD/REPLACE</b> , maximum number of records, record length for new or replaced file, <b>XLATE/NOXLATE, NOEND/END</b> , replacement character
Copy a S/36 file to a virtual disk file	5	PCU ,FILEDISK, S/36 file name, PC file name, virtual disk name, access path, <b>CREATE/REPLACE, NOREADONLY/READONLY, EXCLUSIVE/SHARE, XLATE/NOXLATE, NOEND/END</b> , replacement character
Copy a virtual disk file to a S/36 library member	6	PCU ,DISKLIBR, PC file name, virtual disk name, access path, member name, S/P, library name, <b>CREATE/ADD/REPLACE</b> , record length, <b>XLATE/NOXLATE, NOEND/END</b> , replacement character
Copy a S/36 library member to a virtual disk file	7	PCU ,LIBRDISK, member name, S/P, library name, PC file name, virtual disk name, access path, <b>CREATE/REPLACE, NOREADONLY/READONLY, EXCLUSIVE/SHARE, XLATE/NOXLATE, NOEND/END</b> , replacement character
Copy a virtual disk file to a DisplayWrite/36 document	8	PCU ,DISKDOC, virtual disk name, file name, <b>DATA/FINAL/REVISABLE</b> , access path, <b>STORE/TEXT/PRINT</b> , document name, folder name, <b>NOREPLACE/REPLACE</b> , retention date, document description, printer ID
Copy a DisplayWrite/36 document to a virtual disk file	9	PCU ,DOCDISK, document name, folder name, virtual disk name, filename, access path, <b>NOREPLACE/REPLACE</b>
Modify ASCII to EBCDIC translation table	No opt nbr	PCU ,ASCII
Modify EBCDIC to ASCII translation table	No opt nbr	PCU ,EBCDIC

When you choose an option from the PC Virtual Disk Utilities display, the PC utility prompts you through entering the command and parameters you must use. You can press the System/36 Help key to display help text. The following sections describe the options you can choose from the PC Virtual Disk Utilities display.

## Creating a Virtual Disk

To create a virtual disk, type 1 on the PC Virtual Disk Utilities display and press the Enter key. The following display appears:

```
CREATE VIRTUAL DISK
-----
Type choices, press Enter.

ITEM                CHOICE    POSSIBLE CHOICES
Disk name . . . . . _____ Valid S/36 file label
Disk size . . . . . _____ 5 - 32765 kilobytes
Directory size. . . . . _____ 16 - 2048 entries
Optional description. . . . . _____

Cmd3-Go back      Cmd7-End
```

S9088102-1

This is the same display that would appear if you typed the following on the System/36 Command display:

**PCU ,CREATE**

## **Disk name**

This is the name of the virtual disk to be created on the System/36. The disk name is required. The virtual disk name can be up to 8 characters long, and must start with an alphabetic character (A through Z) or one of three special characters (#, \$, or @). The remaining seven positions in the disk name can be any combination of alphabetic characters, numbers, the three special characters, or a period. Do not use commas, apostrophes, or blanks.

## **Disk size**

This is the size of the new virtual disk in K bytes. The disk size is required. You can specify from 5K bytes through 32765K bytes, in increments of 5K bytes. Values are rounded up to the next increment of 5K bytes.

## **Directory size**

This is the maximum number of files or subdirectories that can be contained in the root directory. The directory size is required. You can specify a number from 16 through 2048. Any number you enter that is not a multiple of 16 will be rounded up to the next increment of 16. One directory entry is used to contain the virtual disk name as a label. All of the remaining directory entries are available to you.

## **Optional description**

If you wish, you can type a description that can be up to 40 characters long. This description can contain any characters except an apostrophe. The description is displayed only by the virtual disk list functions of DisplayWrite/36 or PC Support/36.

When you have completed all of the prompts, press the Enter key. The virtual disk is then created, and the Create Virtual Disk display appears again. From this display, you can do one of the following:

- Create another virtual disk.
- Press command key 7 to end the PC utility.
- Press command key 3 to go back to the previous display.

# Deleting a Virtual Disk

## CAUTION

When you delete a virtual disk, all of the personal computer files currently stored on the current virtual disk are destroyed. Any files you want to maintain must be saved on a different virtual disk before using this option.

To delete a virtual disk, type a 2 on the PC Virtual Disk Utilities display and press the Enter key. The following display appears:

```

DELETED VIRTUAL DISK
-----
Type choice, press Enter.

ITEM                CHOICE                POSSIBLE CHOICES
Name of virtual disk. . . . . _____ Blank for list of disks

Cmd3-Go back      Cmd7-End
```

S9088103-1

This is the same display that would appear if you entered the following on the System/36 Command display:

**PCU ,DELETE**

## **Name of virtual disk**

This is the name of the virtual disk you want to delete. This prompt is required. The name you enter can be up to 8 characters long. If DisplayWrite/36 is installed, you can leave the Name of virtual disk prompt blank and press the Enter key for a list of the virtual disk names you can use.

When you have completed this prompt, press the Enter key. A message appears at the bottom of the display asking you to confirm the delete request by pressing the Enter key again.

If you want to cancel the delete request, press command key 3.

When the virtual disk has been deleted, the **Delete Virtual Disk** display appears again, with a message telling you that the virtual disk was deleted. From this display, you can do one of the following:

- Delete another virtual disk.
- Press command key 7 to end the PC utility.
- Press command key 3 to go back to the previous display.



# Copying a Virtual Disk File to a Virtual Disk File

To copy a virtual disk file to another file on the same virtual disk or to another virtual disk, type a 3 on the PC Virtual Disk Utilities display and press the Enter key. The following display appears:

```

                                COPY PC FILE TO PC FILE
Type choices, press Enter.
ITEM                               CHOICE          POSSIBLE CHOICES
Personal Computer Input
File name and extension . . . . . _____ Blank for list
Disk or diskette name . . . . . _____ Blank for list
Subdirectory (access path). . . .
-----
Personal Computer Output
File name and extension . . . . . _____ Blank for list
Disk or diskette name . . . . . _____
Subdirectory (access path). . . .
-----
Replace existing file . . . . . 2          1=Yes      2=No
Mark file as Read only. . . . . 2          1=Yes      2=No
Output disk access level. . . . . 1          1=Exclusive 2=Share

Cmd3-Go back          Cmd7-End
```

S9088104-2

This is the same display that would appear if you typed the following on the System/36 Command display:

**PCU ,DISKDISK**

# Personal Computer Input

## File name and extension

This is the name of the personal computer file to be copied. This parameter is required. The file name can be up to 8 characters long, followed by a period and up to 3 more characters for the extension. Do not use an asterisk (\*) or a question mark (?).

The file name can consist of alphabetic characters (A through Z), numeric characters (0 through 9), and the following special characters: @, (, ), #, \_ (underscore), \$, - (hyphen), %, left bracket ([), right bracket (]), &, !, ' (left single quote), and ' (apostrophe).

If DisplayWrite/36 is installed, you can leave the File name and extension prompt blank and press the Enter key for a list of the personal computer file names if you specify the input disk or diskette name.

## Disk or diskette name

This is the name of the virtual disk or diskette that contains the input file. This parameter is required. The name can be up to 8 characters long. If DisplayWrite/36 is installed, you can leave the Disk or diskette name prompt blank and press the Enter key for a list of the virtual disk names you can use.

## Subdirectory (access path)

This is a list of the names of one or more subdirectories separated by backslashes (\) or slashes (/). This parameter can be up to 63 characters long. This parameter is optional; if you do not specify a subdirectory, the root directory is used.

# Personal Computer Output

## File name and extension

This is the name of the personal computer file to receive the copy. This parameter is required. The file name can be up to 8 characters long followed by a period and up to 3 more characters for the extension.

The file name can consist of alphabetic characters (A through Z), numeric characters (0 through 9), and the following special characters: @, (, ), #, \_ (underscore), \$, - (hyphen), %, left bracket ([), right bracket (]), &, !, ' (left single quote), and ' (apostrophe).

## Disk or diskette name

This is the name of the existing virtual disk or diskette that will receive the copied file. This parameter is required. The name can be up to 8 characters long. If DisplayWrite/36 is installed, you can leave the Disk or diskette name prompt blank and press the Enter key for a list of the virtual disk names you can use.

## Access path

This is a list of the names of one or more subdirectories separated by backslashes (\) or slashes (/). The output access path parameter can be up to 63 characters long. This parameter is not required; if you do not specify an access path, the root directory is used.

### **Replace existing file (CREATE or REPLACE)**

This parameter allows you to specify whether an existing file with the same name should be replaced with the new file. If there is no existing file, the PC utility creates a new file. If you do not specify this parameter, the default (No or CREATE) is used.

### **Mark file as read only (READONLY or NOREADONLY)**

This parameter allows you to specify whether you want the file to have an access level of read only (a personal computer program cannot write data to the file or delete or replace the file), or whether you want a personal computer program to be able to write or add data to the file. If you do not specify this parameter, the default (No or NOREADONLY) is used.

## **Disk access level (EXCLUSIVE or SHARE)**

This parameter allows you to specify whether you want other users to be able to read from the output virtual disk while the file is being copied. You can specify one of the following:

- 1 (Exclusive). Others will not be allowed to read from the output virtual disk.
- 2 (Share). Others will be allowed to read from the output virtual diskette. You must use this operation when copying a personal computer file to another file on the same virtual disk or diskette.

If you do not specify this parameter, the default, Exclusive, is used.

When you have completed all of the prompts, press the Enter key. When the copy function is complete, the Copy PC File To PC File display appears again. From this display, you can do one of the following:

- Copy another virtual disk file.
- Press command key 7 to end the PC utility.
- Press command key 3 to go back to the previous display.

# Copying a Virtual Disk File to a System/36 File

To copy a virtual disk file to a System/36 file, type a 4 on the PC Virtual Disk Utilities display and press the Enter key. The following display appears:

```

COPY PC FILE TO S/36 FILE
-----
Type choices, press Enter.
ITEM                                CHOICE    POSSIBLE CHOICES
Personal Computer Input
File name and extension . . . . . 4          Blank for list
Disk or diskette name . . . . .          Blank for list
Subdirectory (access path). . . . .
-----
System/36 Output
Option. . . . . 1          1=Create 2=Add
                               3=Replace
File name . . . . .          1-800000
Number of records for new
file. . . . .          1-4096
Record length for new file. . . . .
-----
Translate from ASCII to EBCDIC. . . 1          1=Yes 2=No
Stop on a translation error . . . 2          1=Yes 2=No
Error replacement character . . . -          Any character

Cmd3-Go back          Cmd7-End
  
```

S9088105-3

This is the same display that would appear if you typed the following on the System/36 Command display:

**PCU ,DISKFILE**

# Personal Computer Input

## File name and extension

This is the name of an existing personal computer file on a virtual disk to be copied. This parameter is required. The name can be up to 8 characters long followed by a period and up to 3 more characters for the extension. The file name can consist of alphabetic characters (A through Z), numeric characters (0 through 9), and the following special characters: @, (, ), #, \_ (underscore), \$, - (hyphen), %, left bracket ([), right bracket (]), &, !, ' (left single quote), and ' (apostrophe).

If DisplayWrite/36 is installed, you can leave the File name and extension prompt blank and press the Enter key for a list of the personal computer file names if you specify the input disk or diskette name.

## Disk or diskette name

This is the name of an existing virtual disk or diskette that contains the personal computer file to be copied. This parameter is required. The name can be up to 8 characters long. If DisplayWrite/36 is installed, you can leave the Name of virtual disk prompt blank and press the Enter key for a list of the virtual disk names you can use.

## Subdirectory (access path)

This is a list of the names of one or more subdirectories separated by backslashes (\) or slashes (/). The input access path parameter can be up to 63 characters long. If it is not specified, the root directory is the default.

# System/36 Output

## Option (CREATE, ADD, or REPLACE)

This parameter allows you to specify one of the following:

- 1 (Create), which requires that the System/36 file not exist before the copy.
- 2 (Add), which requires that the System/36 file exist and the data copied will be added to the end of the existing data file.
- 3 (Replace), which means that if a System/36 file of the same name exists, it will be replaced with the new file. However, if the file does not exist, the copy will be done as if create was specified.

If you do not specify this parameter, the default, create, is assumed.

## File name

This is the name to be given to the System/36 file that will contain the data copied from the personal computer file. This parameter is required.

The file name can be up to 8 characters long and must start with an alphabetic character (A through Z) or one of three special characters (#, \$, or @). The remaining seven positions in the disk name can be any combination of alphabetic characters, numbers, and special characters. Do not use commas, apostrophes, or blanks.



## Number of records for new file

This is the maximum number of records the System/36 file can contain. You can specify any number from 1 through 8,000,000. This parameter is ignored for ADD.

## Record length for new file

This is the length of the records to be copied to the System/36 data file. This parameter is required for create or replace operation, but is ignored for an add operation. You can specify any number from 1 through 4096. If the length of a record is less than the specified length, the record will be padded with blanks to reach the specified length.

If the length of a record is greater than the specified length, more than one record will be created to contain all of the input record.

*Note: Personal computer files can contain records with compressed data. For example, the Personal Editor can create files with records that have strings of blank characters represented by one or more tab characters (hexadecimal 09).*

*When the data record is copied to a System/36 data file and the data is being translated from ASCII to EBCDIC, all tabs are expanded to strings of blanks. The length of each string is determined by where the tab occurs within any group of 8 characters to the end of that group of 8 characters. All tabs are expanded to blanks before the record is written.*

## **Translate from ASCII to EBCDIC (XLATE or NOXLATE)**

This parameter specifies whether or not the copy function should translate the data from ASCII to EBCDIC before copying the data into the System/36 file. If you do not specify this parameter, the default (Yes or XLATE) is assumed.

## **Stop on a translation error (NOEND or END)**

This parameter tells the PC utility what to do if it finds an ASCII character that cannot be translated to EBCDIC. Some ASCII characters, especially control characters, cannot be translated to equivalent EBCDIC characters. This parameter is ignored if NOXLATE is specified.

You can specify one of the following:

- 1 (Yes or END) means to end the copy function when an untranslatable character is found. An error message is displayed.
- 2 (No or NOEND) means to substitute a replacement character for any characters that cannot be translated.

If you do not specify this parameter, the default (No) is assumed.

## **Error replacement character**

This parameter allows you to specify the character to be used for the replacement character when an untranslatable character is found. You can specify any character as the replacement character. An EBCDIC blank is the default.

If you specified 2 (No) for Translate from ASCII to EBCDIC or you specified 1 (Yes) for the Stop on a translation error parameter, this parameter is ignored.

When you have completed this prompt, press the Enter key. When the copy is complete, the Copy PC File to S/36 File display appears again, with a message telling you that the copy operation is complete. From this display, you can do one of the following:

- Copy another file.
- Press command key 7 to end the PC utility.
- Press command key 3 to go back to the previous display.

# Copying a System/36 File to a Virtual Disk File

To copy a System/36 file to a virtual disk file, type a 5 on the PC Virtual Disk Utilities display and press the Enter key. The following display appears:

```

                                COPY S/36 FILE TO PC FILE
-----
Type choices, press Enter.
ITEM                               CHOICE          POSSIBLE CHOICES
System/36 Input
File name . . . . . █
Personal Computer Output
File name and extension . . . . . _____
Disk or diskette name . . . . . _____      Blank for list
Subdirectory (access path). . . . . _____
-----
Replace existing file . . . . . 2             1=Yes      2=No
Mark file as Read only. . . . . 2/NO       1=Yes      2=No
Output disk access level. . . . . 1             1=Exclusive 2=Share

Translate from EBCDIC to ASCII. . . . . 1             1=Yes      2=No
Stop on a translation error . . . . . 2/NO       1=Yes      2=No
Error replacement character . . . . . -             Any character

Cmd3-Go back          Cmd7-End
  
```

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This is the same display that would appear if you typed the following on the System/36 Command display:

## PCU ,FILEDISK

### System/36 Input File name

This is the name of the System/36 file that will be copied from. This parameter is required. The name can be up to 8 characters long.

# Personal Computer Output

## File name and extension

This is the name of the personal computer file to which the System/36 file is being copied. This parameter is required.

The file name can be up to 8 characters long, followed by a period and up to 3 characters for the extension. The file name can consist of alphabetic characters (A through Z), numeric characters (0 through 9), and the following special characters: @, (, ), #, \_ (underscore), \$, - (hyphen), %, left bracket ([), right bracket (]), &, !, ' (left single quote), and ' (apostrophe).

## Disk or diskette name

This is the name of an existing virtual disk or diskette to which the System/36 file is to be copied. This parameter is required. The name can be up to 8 characters long. If DisplayWrite/36 is installed, you can leave the Disk or diskette name prompt blank and press the Enter key for a list of the virtual disk names you can use.

## Subdirectory (access path)

This is a list of the names of one or more subdirectories separated by backslashes (\) or slashes (/). The input access path parameter can be up to 63 characters long. This parameter is optional; if you do not specify the access path, the root directory is used.

### **Replace existing file (CREATE or REPLACE)**

This parameter allows you to specify whether an existing file with the same name should be replaced with the new file. If there is no existing file, the PC utility creates a new file. If you do not specify this parameter, the default (No) is used.

### **Mark file as read only (READONLY or NOREADONLY)**

This parameter allows you to specify whether you want the file to have an access level of read only (a personal computer program cannot write data to the file, or delete or replace the file), or whether you want a personal computer program to be able to write or add data to the file. If you do not specify this parameter, the default (No) is used.

### **Output disk access level (EXCLUSIVE or SHARE)**

This parameter allows you to specify whether you want other users to be able to read from the output virtual disk while the file is being copied. You can specify one of the following:

- 1 (Exclusive). Others will not be allowed to read from the output virtual disk.
- 2 (Share). Others will be allowed to read from the output virtual diskette.

### **Translate from EBCDIC to ASCII (XLATE or NOXLATE)**

This parameter specifies whether or not the copy function should translate the data from EBCDIC to ASCII before copying the data into the personal computer file. If you do not specify this parameter, the default (Yes) is assumed.

## **Stop on a translation error (NOEND or END)**

This parameter tells the PC utility what to do if it finds an EBCDIC character that cannot be translated to ASCII. Some EBCDIC characters, especially control characters, cannot be translated to equivalent ASCII characters. This parameter is ignored if NOXLATE is specified.

You can specify one of the following:

- 1 (Yes) means to end the copy function when an untranslatable character is found. An error message is displayed.
- 2 (No) means to substitute a replacement character for any characters that cannot be translated.

If you do not specify this parameter, the default, no, is assumed.

## **Error replacement character**

This parameter allows you to specify the character to be used for the replacement character when an untranslatable character is found. You can specify any character as the replacement character. An ASCII blank is the default.

If you specified 2 (No) for the Translate from EBCDIC to ASCII prompt, or if you specified 1 (Yes) on the Stop on a translation error prompt, this parameter is ignored.

When you have completed this prompt, press the Enter key.

The Copy PC File to S/36 File display appears again, with a message telling you that the copy is complete. You can do one of the following:

- Copy another virtual disk file.
- Press command key 7 to end the PC utility.
- Press command key 3 to go back to the previous display.



# Copying a Virtual Disk File to a System/36 Library Member

To copy a virtual disk file to a System/36 library member, type a 6 on the PC Virtual Disk Utilities display and press the Enter key. The following display appears:

```

      COPY PC FILE TO LIBRARY MEMBER
-----
Type choices, press Enter.
ITEM                                CHOICE    POSSIBLE CHOICES
Personal Computer Input
File name and extension . . . . . _____ Blank for list
Disk or diskette name . . . . . _____ Blank for list
Subdirectory (access path). . . . .
-----
System/36 Output
Option . . . . . 1                1=Create 2=Add
                                       3=Replace
Member name . . . . . _____
Member type . . . . . 1            1=Source 2=Proc
Library name. . . . . _____
Member record length. . . . . 36    40-120
Translate from ASCII to EBCDIC. . . . 1        1=Yes   2=No
Stop on a translation error . . . . 2        1=Yes   2=No
Error replacement character . . . . -        Any character

Cmd3-Go back          Cmd7-End

```

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This is the same display that would appear if you typed the following on the System/36 Command display:

**PCU ,DISKLIBR**

# Personal Computer Input

## File name and extension

This is the name of the personal computer file to be copied. This parameter is required. The file name can be up to 8 characters long, followed by a period and up to 3 more characters for the extension. Do not use an asterisk (\*) or a question mark (?).

The file name can consist of alphabetic characters (A through Z), numeric characters (0 through 9), and the following special characters: @, (, ), #, \_ (underscore), \$, - (hyphen), %, left bracket ([), right bracket (]rbrk.), &, !, ' (left single quote), and ' (apostrophe).

If DisplayWrite/36 is installed, you can leave the File name and extension prompt blank and press the Enter key for a list of the personal computer file names if you specify the input disk or diskette name.

## Disk or diskette name

This is the name of the virtual disk or diskette that contains the personal computer file to be copied. This parameter is required. The name can be up to 8 characters long. If

DisplayWrite/36 is installed, you can leave the Disk or diskette name prompt blank and press the Enter key for a list of the virtual disk names you can use.

## Subdirectory (access path)

This is a list of the names of one or more subdirectories separated by backslashes (\) or slashes (/). The input access path parameter can be up to 63 characters long. This parameter is optional; if you do not specify the access path, the root directory is used.

## **System/36 Output**

### **Option (CREATE, ADD, or REPLACE)**

This parameter allows you to specify one of the following:

- 1 (Create), which requires that the System/36 library member not exist before the copy
- 2 (Add), which requires that the System/36 library member exist and the data copied will be added to the end of the existing library member
- 3 (Replace), which means that if a System/36 library member of the same name exists, it will be replaced with the new file. However, if the library member does not exist, the copy will be done as if 1 (Create) was specified.

If you do not specify this parameter, the default, create, is assumed.

### **Member name**

This is the name given to the library member to contain the data copied from the personal computer file. This parameter is required.

The member name can be up to 8 characters long and must start with an alphabetic character (A through Z) or one of three special characters (#, \$, or @). The remaining seven positions in the member name can be any combination of alphabetic characters, numbers, or special characters. Do not use commas, apostrophes, or blanks.

## **Member type (S or P)**

This is the type of member that will be copied to the library. You can specify one of the following:

- 1 (Source) for a source library member
- 2 (Proc) for a procedure library member

If you do not specify this parameter, 1 (Source) is assumed.

## **Library name**

This is the name of an existing library to contain the copied member. This parameter is required. The library name can be up to 8 characters long.

## Member record length

This is the length of the records to be copied to the library member. The range is 40 through 120. The default length is 120, if PCU ,DISKLIBR,,,,,P is entered on the command line. Otherwise, the default is 96. If the length of a record is less than the specified length, the record will be padded with blanks to reach the specified length.

If the length of a record is greater than the specified length, more than one record will be created to contain all of the input record.

*Note: Personal computer files can contain records with compressed data. For example, the Personal Editor can create files with records that have strings of blank characters represented by one or more tab characters (hexadecimal 09).*

*When the data record is copied to a System/36 library member and the data is being translated from ASCII to EBCDIC, all tabs are expanded to strings of blanks. The length of each string is determined by where the tab occurs within any group of 8 characters to the end of that group of 8 characters. All tabs are expanded to blanks before the record is written.*

## **Translate from ASCII to EBCDIC (XLATE or NOXLATE)**

This parameter specifies whether or not the copy function should translate the data from ASCII to EBCDIC before copying the data into the System/36 library member. If you do not specify this parameter, the default (Yes) is assumed.

## **Stop on a translation error (NOEND or END)**

This parameter tells the PC utility what to do if it finds an ASCII character that cannot be translated to EBCDIC. Some ASCII characters, especially control characters, cannot be translated to equivalent EBCDIC characters.

You can specify one of the following:

- 1 (Yes) means to end the copy function when an untranslatable character is found. An error message is displayed.
- 2 (No) means to substitute a replacement character for any characters that cannot be translated. This is ignored if NOXLATE is specified.

If you do not specify this parameter, the default, no, is assumed.

## **Error replacement character**

This parameter allows you to specify the character to be used for the replacement character when an untranslatable character is found. You can specify any character as the replacement character. An EBCDIC blank is the default.

If you specified 1 (Yes) for the Stop on a translation error parameter, or if you specified NOXLATE, this parameter is ignored.

When you have completed this prompt, press the Enter key.

The Copy PC File to Library Member display appears again, with a message telling you the copy is complete. You can do one of the following:

- Copy another personal computer file.
- Press command key 7 to end the PC utility.
- Press command key 3 to go back to the previous display.

# Copying a System/36 Library Member to a Virtual Disk File

To copy a System/36 library member to a virtual disk file, type a 7 on the PC Virtual Disk Utilities display and press the Enter key. The following display appears:

COPY LIBRARY MEMBER TO PC FILE		
Type choices, press Enter.		
ITEM	CHOICE	POSSIBLE CHOICES
<b>System/36 Input</b>		
Member name . . . . .	_____	
Member type . . . . .	1	1=Source 2=Proc
Library name . . . . .	_____	
<b>Personal Computer Output</b>		
File name and extension . . . . .	_____	
Disk or diskette name . . . . .	_____	Blank for list
Subdirectory (access path) . . . . .		
<hr/>		
Replace existing file . . . . .	2	1=Yes 2=No
Mark file as Read only . . . . .	2	1=Yes 2=No
Output disk access level . . . . .	1	1=Exclusive 2=Share
<hr/>		
Translate from EBCDIC to ASCII . . . . .	1	1=Yes 2=No
Stop on a translation error . . . . .	2	1=Yes 2=No
Error replacement character . . . . .	-	Any character
Cmd5-Go back	Cmd7-End	

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This is the same display that would appear if you typed on the System/36 Command display:

**PCU ,LIBRDISK**



## **System/36 Input**

### **Member name**

This is the name of the library member from which the data will be copied to the personal computer file. This parameter is required. The member name can be up to 8 characters long.

### **Member type (S or P)**

This is the type of member that will be copied to the library. You can specify one of the following:

- 1 (Source) for a source library member
- 2 (Proc) for a procedure library member

If you do not specify this parameter, 1 (Source) is assumed.

### **Library name**

This is the name of the library that contains the member to be copied. This parameter is required. The library name can be up to 8 characters long.

# **Personal Computer Output**

## **File name and extension**

This is the name of the personal computer file to receive the copy. This parameter is required.

The name can be up to 8 characters long, followed by a period and up to 3 more characters for the extension. Do not use an asterisk (\*) or a question mark (?). The name and extension can be alphabetic characters (A through Z), numeric characters (0 through 9), and the following special characters: @, (, ), #, \_ (underscore), \$, - (hyphen), %, left bracket ([), right bracket (]), &, !, ' (left single quote), and ' (apostrophe).

## **Disk or diskette name**

This is the name of the virtual disk or diskette to receive the library member. This parameter is required. The name can be up to 8 characters long. If DisplayWrite/36 is installed, you can leave the Disk or diskette name prompt blank and press the Enter key for a list of the virtual disk names you can use.

## **Subdirectory (access path)**

A series of subdirectory names containing the file. The access path can be up to 63 characters long. The subdirectory names are separated by backslashes (\) or slashes (/). If the access path is not specified, the root directory is assumed.

### **Replace existing file (CREATE or REPLACE)**

This parameter allows you to specify whether an existing file with the same name should be replaced with the new file. If there is no existing file, the PC utility creates a new file. If you do not specify this parameter, the default (No) is used.

### **Mark file as read only (NOREADONLY or READONLY)**

This parameter allows you to specify whether you want the file to have an access level of read only (a personal computer program cannot write data to the file or replace or delete the file), or whether you want a personal computer program to be able to write or add data to the file. If you do not specify this parameter, the default (No) is used.

### **Output disk access level (EXCLUSIVE or SHARE)**

This parameter allows you to specify whether you want other users to be able to read from the output virtual disk while the library member is being copied. You can specify one of the following:

- 1 (Exclusive). Others will not be allowed to read from the output virtual disk.
- 2 (Share). Others will be allowed to read from the output virtual diskette.

## **Translate from EBCDIC to ASCII (XLATE or NOXLATE)**

This parameter specifies whether or not the copy function should translate the data from EBCDIC to ASCII before copying the data into the personal computer file. If you do not specify this parameter, the default (Yes) is assumed.

## **Stop on a translation error (NOEND or END)**

This parameter tells the PC utility what to do if it finds an EBCDIC character that cannot be translated to ASCII. Some EBCDIC characters, especially control characters, cannot be translated to equivalent ASCII characters. This parameter is ignored if NOXLATE is specified.

You can specify one of the following:

- 1 (Yes) means to end the copy function when an untranslatable character is found. An error message is displayed.
- 2 (No) means to substitute a replacement character for any characters that cannot be translated.

If you do not specify this parameter, the default (No) is assumed.

## **Error replacement character**

This parameter allows you to specify the character to be used for the replacement character when an untranslatable character is found. You can specify any character as the replacement character. An ASCII blank is the default.

If you specified 1 (Yes) for the Stop on a translation error parameter, or if you specified NOXLATE, this parameter is ignored.

When you have completed all of the prompts on the display, press the Enter key.

The Copy Library Member to PC File display appears again, with a message telling you that the copy is complete. You can do one of the following:

- Copy another library member.
- Press command key 7 to end the PC utility.
- Press command key 3 to go back to the previous display.

## **Copying a Virtual Disk File to a DisplayWrite/36 Document (if Supported)**

This function is provided by the DisplayWrite/36 Program Product. To copy a virtual disk file to a DisplayWrite/36 document, type an 8 on the PC Virtual Disk Utilities display and press the Enter key. This displays the Copy PC File to Document display. This display is the same display that would appear if you entered:

**PCU ,DISKDOC**

on the System/36 Command display.

For details on how to use the DisplayWrite/36 PC Exchange Utility, you can press the Help key.

## **Copying a DisplayWrite/36 Document to a Virtual Disk File (if Supported)**

This function is provided by the DisplayWrite/36 Program Product. To copy a DisplayWrite/36 document to a virtual disk file, type a 9 on the PC Virtual Disk Utilities display and press the Enter key. This displays the Copy Document to PC File display. This display is the same display that would appear if you entered the following on the System/36 Command display:

**PCU ,DOCDISK**

For details on how to use the DisplayWrite/36 PC Exchange Utility, you can press the Help key.

# Modifying an ASCII to EBCDIC Translation Table

*Note: If you plan to use the PC Support/36 transfer facility, any changes you make to the translation table must also be made to the personal computer translation table in order for the data to be translated correctly. Refer to Chapter 7, "The Translation Table Utility" for more information.*

To modify the ASCII to EBCDIC translation table, type:

**PCU ,ASCII**

on the System/36 command display and press the Enter key. The following display appears:

		Change ASCII to EBCDIC TRANSLATION TABLE																																																	
BASE		First hexadecimal digit																																																	
US ENGLISH		00	01	02	03	04	05	06	07	08	09	0A	0B	0C	0D	0E	0F	00	01	02	03	04	05	06	07	08	09	0A	0B	0C	0D	0E	0F																		
		00	00	10	20	30	40	50	60	70	80	90	A0	B0	C0	D0	E0	F0	00	00	00	40	F0	7C	D7	79	97	8B	71	45	00	00	00	00	00	00	01	02	03	04	05	06	07	08	09	0A	0B	0C	0D	0E	0F
		01	00	00	5A	F1	C1	D8	81	98	DC	9C	55	00	00	00	59	8F	01	02	03	04	05	06	07	08	09	0A	0B	0C	0D	0E	0F	01	02	03	04	05	06	07	08	09	0A	0B	0C	0D	0E	0F			
		02	00	00	7F	F2	C2	D9	82	99	51	9E	CE	00	00	00	00	DA	02	03	04	05	06	07	08	09	0A	0B	0C	0D	0E	0F	02	03	04	05	06	07	08	09	0A	0B	0C	0D	0E	0F					
		03	00	00	7B	F3	C3	E2	83	A2	42	CB	DE	4F	00	00	00	8D	03	04	05	06	07	08	09	0A	0B	0C	0D	0E	0F	03	04	05	06	07	08	09	0A	0B	0C	0D	0E	0F							
		04	00	B8	5B	F4	C4	E3	84	A3	43	CC	49	00	00	00	00	04	04	05	06	07	08	09	0A	0B	0C	0D	0E	0F	04	05	06	07	08	09	0A	0B	0C	0D	0E	0F									
	Second	05	00	B5	6C	F5	C5	E4	85	A4	44	CD	69	00	00	00	00	05	05	06	07	08	09	0A	0B	0C	0D	0E	0F	05	06	07	08	09	0A	0B	0C	0D	0E	0F											
		06	00	00	50	F8	C6	E5	86	A5	47	DB	9A	00	00	00	A0	06	06	07	08	09	0A	0B	0C	0D	0E	0F	06	07	08	09	0A	0B	0C	0D	0E	0F													
	hexadecimal	07	00	00	7D	F7	C7	E6	87	A6	46	DD	9B	00	00	00	00	07	07	08	09	0A	0B	0C	0D	0E	0F	07	08	09	0A	0B	0C	0D	0E	0F															
		08	00	00	4D	F8	C8	E7	88	A7	52	DF	AB	00	00	00	00	08	08	09	0A	0B	0C	0D	0E	0F	08	09	0A	0B	0C	0D	0E	0F																	
	digit	09	00	00	5D	F9	C9	E8	89	A8	53	EC	00	00	00	00	00	09	09	0A	0B	0C	0D	0E	0F	09	0A	0B	0C	0D	0E	0F																			
		0A	00	00	5C	7A	D1	E9	91	A9	54	FC	5F	00	00	00	00	0A	0A	0B	0C	0D	0E	0F	0A	0B	0C	0D	0E	0F																					
		0B	00	00	4E	5E	D2	00	92	C0	57	4A	B8	00	00	00	00	0B	0B	0C	0D	0E	0F	0B	0C	0D	0E	0F																							
		0C	00	00	6B	4C	D3	E0	93	6A	58	B1	B7	00	00	00	00	0C	0C	0D	0E	0F	0C	0D	0E	0F																									
		0D	00	00	60	7E	D4	00	94	D0	58	R2	AA	00	00	00	80	0D	0D	0E	0F	0D	0E	0F																											
		0E	00	00	4B	6E	D5	00	95	A1	63	B3	8A	00	00	00	00	0E	0E	0F	0E	0F																													
		0F	9F	00	61	6F	D6	8D	96	00	67	B4	8B	00	00	00	00	0F	0F	0F																															
		00	10	20	30	40	50	60	70	80	90	A0	B0	C0	D0	E0	F0																																		

Cmd7-Replace                      Cmd19-Cancel                      COPR IBM Corp. 1985

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*Note: The ASCII to EBCDIC translation table can also be modified using the System/36 command CHGX LATE. Refer to the System/36 manual System Reference for details.*

The ASCII to EBCDIC translation table displays, in hexadecimal notation, the EBCDIC character to which each ASCII character is translated.

If you wanted to change the the translation character used for ASCII 1, you would use the hexadecimal value of ASCII 1 (hexadecimal 31) to look up the hexadecimal value of the EBCDIC character used. In this case, the EBCDIC character is found in column 30, row 01. The value in this position on the table is F1, which is an EBCDIC 1.

To change this value, position the cursor under the F1 in column 30, row 1. Type the hexadecimal value of the EBCDIC character to which you want ASCII 1 translated. You can type any two characters from 0 through 9 and A through F. An entry of 00 in any position on the table means that the ASCII character cannot be translated into EBCDIC.

When you are finished updating the table, you can do one of the following:

- Press command key 7 to update the table and end the PC utility.
- Press command key 19 to end the program without updating the translation table.



# Modifying an EBCDIC to ASCII Translation Table

*Note: If you plan to use the PC Support/36 transfer facility, any changes you make to the translation table must also be made to the personal computer translation table in order for the data to be translated correctly. Refer to Chapter 7, "The Translation Table Utility," for more information.*

To modify the EBCDIC to ASCII translation table, type:

**PCU ,EBCDIC**

on the System/36 Command display and press the Enter key.

BASE		Change EBCDIC TO ASCII TRANSLATION TABLE															
US ENGLISH		First hexadecimal digit															
	Second hexadecimal digit	00	10	20	30	40	50	60	70	80	90	A0	B0	C0	D0	E0	F0
00		00	00	00	00	20	28	2D	ED	ED	F8	E8	98	78	7D	5C	30
01		00	00	00	00	20	82	2F	90	61	8A	7E	9C	41	4A	20	31
02		00	00	00	00	83	88	83	88	62	8B	73	9D	42	4B	53	32
03		00	00	00	00	84	89	8E	89	63	8C	74	9E	43	4C	54	33
04		00	00	00	00	85	8A	85	8A	64	8D	75	9F	44	4D	55	34
05		00	00	00	00	A0	A1	A0	A1	65	8E	76	15	45	4E	56	35
06		00	00	00	00	A8	8C	A8	8C	68	8F	77	14	46	4F	57	36
07		00	00	00	00	86	8B	8F	8B	67	70	78	AC	47	50	58	37
08		00	00	00	00	87	8D	80	8D	68	71	79	AD	48	51	59	38
09		00	00	00	00	A4	E1	A5	60	69	72	7A	00	49	52	5A	39
0A		00	00	00	00	9B	21	7C	3A	AE	AD	AA	2D	F2	FD	00	0A
0B		00	00	00	00	2E	24	2C	23	AF	A7	A8	B3	93	96	93	96
0C		00	00	00	00	3C	2A	25	40	00	91	00	00	94	81	89	9A
0D		00	00	00	00	28	29	5F	27	F3	00	18	00	95	97	95	97
0E		00	00	00	00	2B	3B	3E	3D	00	92	00	27	A2	A3	A2	A3
0F		00	00	00	00	B3	AA	3F	22	F1	0F	00	CD	A7	98	A7	00
		00	10	20	30	40	50	60	70	80	90	A0	B0	C0	D0	E0	F0

Cmd7-Replace                      Cmd19-Cancel                      COPR IBM Corp. 1985

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*Note: The EBCDIC to ASCII translation table can also be modified using the System/36 command CHGXATE. Refer to the System/36 manual System Reference for details.*

The EBCDIC to ASCII translation table displays, in hexadecimal notation, the ASCII character to which each EBCDIC character is translated.

If you wanted to change the the translation character used for EBCDIC 1, you would use the hexadecimal value of EBCDIC 1 (hexadecimal F1) to look up the hexadecimal value of the ASCII character used. In this case, the ASCII character is found in column F0, row 01. The value in this position on the table is 31, which is an ASCII 1.

To change this value, position the cursor under the 31 in column F0, row 01. Type the hexadecimal value of the ASCII character to which you want EBCDIC 1 translated. You can type any two characters from 0 through 9 and A through F. An entry of 00 in any position on the table means that the EBCDIC character cannot be translated into ASCII.

When you are finished updating the table, you can do one of the following:

- Press command key 7 to update the table and end the PC utility.
- Press command key 19 to end the program without updating the translation table.



# Chapter 9. The PC Support/36 Message Facility

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# Overview

The PC Support/36 message facility provides the following functions:

- Allows you to communicate with other display stations, personal computers attached to your System/36, and users located elsewhere on the IBM Token-Ring Network.
- Displays any message that has been queued on the System/36 for you or your personal computer.

## Prerequisites

The IBM Token-Ring Network, the IBM Token-Ring Network Adapter Support Interface (TOKREUI.COM), and the IBM Token-Ring router must be running before you can start the PC Support/36 message facility. The PC Support/36 message facility will not work with a 5250 router.

# Automatic Start of the PC Support/36 Message Facility

If you want the PC Support/36 message facility active whenever you are using your personal computer as a terminal on your local System/36, it is recommended that you either create an AUTOEXEC.BAT file containing all of the necessary entries needed to activate the message facility, or add the STARTMSG command to the LINK36.BAT file.

The following example shows what the contents of an AUTOEXEC.BAT file might look like (rem means the line is a comment line):

```
rem Prompt for correct DATE and TIME
rem (optional)
DATE
TIME
rem Install the IBM Token-Ring Network
rem and start the router.
TOKREUI
STARTRTR
rem After starting the router, enter your
rem user ID and password when prompted.
rem Start the PC Support/36 Message Facility.
STARTMSG CONFIG.MSG
rem If you do not specify a configuration file,
rem CONFIG.S36 will be used.
```

# Configuration File Entries MDEF, MMRI, and MTIM

The MDEF, MMRI, and MTIM configuration file entries can be in CONFIG.S36, or the alternate configuration file specified by the STARTMSG command.

If you do not have these entries in any of the previous configuration files, the message facility will use the default values of:

```
MDEF ,1
MMRI 60
MTIM 60
```

This will put you into Notify mode with a message receive interval of 60 seconds. MTIM has no affect in Notify mode.

For detail descriptions of MDEF, MMRI, and MTIM, refer to Chapter 2 in the *PC Support/36 User's Guide*.

# Notify Mode

Notify mode gives you an audible indication that you have messages waiting.

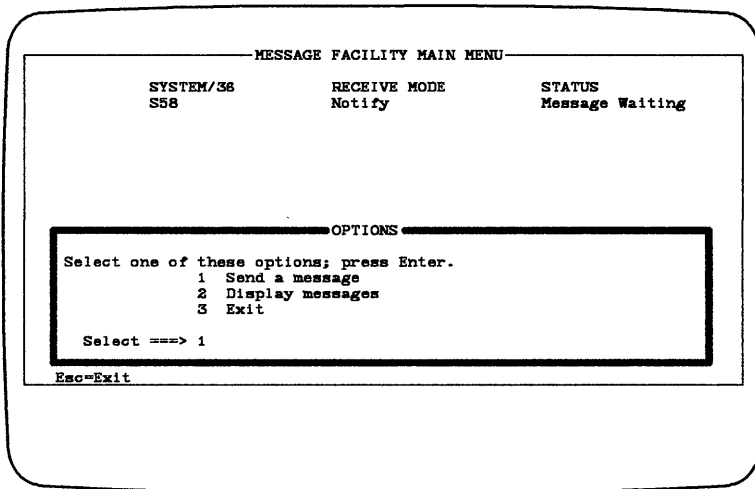
You can vary the time between alarms by placing a MMRI entry in a configuration file with the value you want (1 to 3600 seconds). You could also have a MDEF ,1 entry in the same configuration file. With MDEF ,1 and MMRI 20 seconds, you will hear an audible alarm when there are messages for you or your personal computer at the System/36. The message facility will check the System/36 every 20 seconds for messages. If messages have been received for you since the last check, you will hear another audible alarm. If there are messages for you, but no new ones since the last check, you will not receive an audible alarm.



To display these messages, you enter:

**MSG**

The following display will appear:



S9097908-2

Select option 2 (Display messages). Up to three messages will be displayed in the message window.

DISPLAY MESSAGES

SYSTEM/36  
S58

RECEIVE MODE  
Notify

STATUS

MESSAGES

From-JONES      PC Location-DENVER      Date-09/19/88      Time-09:32:53  
This is an example message that can be up to 75 characters long.  
From-SMITH      WSID-W2      Date-09/19/88      Time-09:33:53  
Text message 2  
From-ABLE      Address-HOUSE      Date-09/19/88      Time-09:34:00  
Text message 3

-----  
Esc=Exit to Options Menu

S9097911-3

If there are more than three messages, the display window will have downward pointing arrows at the bottom of the window. Press the PgDn key to display the next three or remaining messages.

Once a message has been displayed, it cannot be displayed again. If you want to save the displayed messages, you can send them to the personal computer printer by pressing the shift and PrtSc keys

or

Enter the following command rather than the MSG command:

**RCVMSG [filename]**

The RCVMSG command puts the messages in the file you specified. You can then use DOS commands or your own code to display the messages.

# Immediate Mode

Immediate mode displays your messages in a window on your display automatically.

To automatically display messages, your configuration file entry must be `MDEF ,2`. You can accept the defaults for `MMRI` and `MTIM`, or you can change them with new entries in the same configuration file.

With the following in your configuration file:

```
MDEF ,2
MMRI 25
MTIM 35
```

you will hear an audible alarm when the message facility checks the System/36 and you have messages. The application that is running will stop, and your messages will be displayed for 35 seconds.

*Note: Your personal computer has to be in the proper operating mode to display messages automatically. Refer to **Compatibility Considerations** later in this chapter.*

```
..          <DIR>          3-13-86      8:30a
PE         TEM          5190      2-20-86      4:06p
PE         EXE          45898     3-28-86      2:20p
PE         PRO          2022      4-01-86      8:09p
PE         HLP          3519      10-28-82     12:00p
```

```
PC SUPPORT/36 MESSAGE
```

```
FROM-JAMIE      WSID-W2          DATE-05/08/87   TIME-14:09:07
The text of the first message

FROM-TRAVIS     PC LOCATION-TESTER  DATE-05/08/87   TIME-14:15:11
The text of the second message

FROM-CRYSTAL    ADDRESS-HOME         DATE-05/08/87   TIME-18:12:03
The text of the third message
```

```
Esc=Exit
```

```
Version 04.00 (c) IBM Corp. 1986
```

```
TOPRINT  MAC          499      5-13-86      1:52p
CLPRGREF SCR          15198     1-01-80      5:00a
TOPC     MAC          321      1-01-80      2:43a
23 File(s) 4780032 bytes free
```

```
C:/UTILS\PE >
```

S9097921-0

Press the Esc key to exit the display window.

If you do not press the Esc key, the display window will disappear after 35 seconds and the application will resume running until a key is pressed. When a key is pressed, the display window will reappear. This process will repeat until you press the Esc key. Each time the display window appears and disappears, the application stops and resumes running.

With a MMRI of 25 seconds, the message facility will check the System/36 for messages every 25 seconds. If new messages have been received since the last check, you will hear another audible alarm. If no new messages have been received, you will not hear an audible alarm.

The message display window will contain up to three messages. If there are more than three messages, the window will have downward arrows on the bottom of the window. You display the next three or remaining messages by pressing the PgDn key.

Once a message has been displayed, it cannot be displayed again. If you want to save the displayed messages, you can send them to the personal computer printer by pressing the shift and PrtSc keys.

# Changing Modes

You can change message modes by doing a **STARTMSG** command with an alternate configuration file name specified. The alternate configuration file would contain an **MDEF** value.

For example, you could have a configuration file with a **MDEF ,1**. Now, whenever you wanted your message mode to be **Notify**, you would enter:

## **STARTMSG configuration file 1 name**

This would put your message facility in **Notify** mode.

You could also have a second configuration file with **MDEF ,2**. Now, when you wanted your messages automatically displayed, you would enter:

## **STARTMSG configuration file 2 name**

This will put your message facility in **Immediate** mode, and your messages will be displayed automatically.

Both of these examples would use the default values for **MMRI** and **MTIM**.

# Batch Error Level Codes

## Set by STARTMSG

If you are using a batch file, STARTMSG sets a return code that can be checked by the DOS batch file command IF ERRORLEVEL. If STARTMSG is started successfully, the error level is 0. If an error occurs, but STARTMSG is able to continue, the error level is 10. If an error occurs and STARTMSG can not continue, the error level is 20.

## Set by MSG

If you are using a batch file, MSG sets a return code that can be checked by the DOS batch file command IF ERRORLEVEL. If MSG is started successfully, the error level is 0. If an error occurs, but MSG is able to continue, the error level is 10. If an error occurs and MSG can not continue the error level is 20.

## Set by RCVMSG

If you are using a batch file, RCVMSG sets a return code that can be checked by the DOS batch file command IF ERRORLEVEL. If RCVMSG is started successfully, the error level is 0. If an error occurs, but RCVMSG is able to continue, the error level is 10. If an error occurs and RCVMSG can not continue, the error level is 20.



## **Set by STOPMSG**

If you are using a batch file, STOPMSG sets a return code that can be checked by the DOS batch file command `IF ERRORLEVEL`. If the process was successful, the error level is 0. If the process was not successful, the error level is 20.

## **Security Considerations**

Your messages are only as secure as the password you use to sign on System/36. If another user knows your user identifier and password, that user will be able to access your messages. Once the messages have been displayed, they are no longer available to be displayed again.

# Performance Considerations

If you decide to use the MSG or RCVMSG command to use the message facility without using the STARTMSG command, the send, receive, and display functions will dynamically allocate and deallocate the sessions to the System/36 each time the functions are selected. This will degrade the performance of the send, receive, and display function.

If you use the STARTMSG command, a send and a receive session is established to the System/36. Whenever the MSG or RCVMSG command is used, the current session is used and eliminates the need to allocate and deallocate each time the commands are issued. This will improve the performance of the message facility.

It is highly recommended that you use the STARTMSG command. STARTMSG will load the resident message receiver:

- Loading the resident message receiver is the only way you will have any indication that a message has been received by System/36. A beep will be sounded or the message may be displayed.
- You will be able to receive messages that were sent as ALL by a local user.
- You will be able to receive messages that were sent to your PC location.

- The resident message receiver will establish a send and a receive session to the System/36. These sessions can then be used by the other message facility functions without allocating and deallocating sessions, thereby improving performance.
- The translate tables are established for the rest of the PC Support/36 message facility functions.

When the resident message receiver is loaded, there will be a performance impact on the personal computer in several areas:

- There will be an 18K byte decrease in memory availability.
- When a message has been received by the host system and that session is configured in Immediate mode, the message receiver may interrupt an application that is currently executing, and the message is displayed. This will impact the performance of the running application until the message receiver returns control to the application.
- The message receive interval controls how often messages are automatically displayed to the user or the user is notified of existing messages. The MMRI identifier controls how often messages are checked for on the System/36. Changing the MMRI entry can increase or decrease performance.

# Compatibility Considerations

There are some programs that will prevent automatic notification of messages in either Notify or Immediate mode. These programs:

- Do not use DOS function calls for standard input or output.
- Do not use BIOS keyboard support.
- Do not pass on keystrokes. For example, terminal emulators.

These programs will prevent automatic notification or display of messages while they are executing. After the program has terminated, automatic notification or display of messages will continue.

# PC Location Name Considerations

When sending and receiving messages, the destination can be the personal computer location, as specified in the TRLN entry in your configuration file or user-ID. It is recommended that the personal computer location name be different than the user-ID, so that you can receive messages sent to your personal computer or your user-ID.



# Chapter 10. Service Procedures

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This section describes the information required when it is necessary to submit an authorized program analysis report (APAR), apply a program temporary fix (PTF), run the DEBUG program, dump the contents of the personal computer storage, or apply a patch.

## **Submitting an Authorized Program Analysis Report (APAR)**

Before submitting an APAR, make sure you have read the procedures in Chapter 12, "Problem Determination Procedures," in the *PC Support/36 User's Guide* to help isolate the problem. If the problem is suspected to be IBM's, an APAR should be submitted with enough information to help isolate and recreate the problem with PC Support/36.

Attach a detailed description of the problem and detailed instructions on how to re-create the problem. Do not leave out information that you feel might be obvious. Any information left out may result in an invalid APAR.

If the output is incorrect, explain what output you expect and what output you actually got. If the personal computer is in a wait or a loop, include a list of all programs that were running at the time.

An attempt should be made to reduce the problem to its simplest form. Vary the environment to try to isolate the problem. For example, if the problem occurred while using the transfer facility to transfer a file to a virtual disk, run the same transfer request again, this time to a real disk or diskette or to the display. Find out if the problem occurs when requesting all fields or just one particular field. Record the results and include this information with the APAR.

The following information should be collected (if possible) and submitted with the APAR:

*Note: When you are asked to copy personal computer information to a diskette, you can use the DOS COPY command.*

- *A copy of the trace information:* Run trace for PC Support/36 as described in the System/36 manual *Program Problem Diagnosis and Diagnostic Aids*, and dump this information to the printer.
- *A copy of the personal computer display:* If you have a printer attached to your personal computer, make sure the printer is powered on and the printer Ready light is on. Press and hold the Shift key, then press the PrtSc key. The output is sent to the personal computer printer.

*Note: If printer emulation is active, place the printer in Suspend mode so that the job will print.*



- *A System/36 task dump:* Take a System/36 task dump of the task that was running at the time of the failure. Refer to the *Program Problem Diagnosis and Diagnostic Aids* manual for information on task dumps.
- *A dump of selected portions of personal computer memory:* Refer to “Running the DOS DEBUG Program” later in this chapter for information on what portions of storage should be dumped and how to dump them.
- *The personal computer hardware configuration:* This is a description of the hardware installed or attached to the personal computer, including information such as total storage size, type(s) of displays attached, type of display used when the error occurred, number of diskette drives configured, number of diskette drives actually attached, presence or absence of a fixed disk, other installed adapters such as communications, printer, and so forth.

Most of this information can be obtained by running the Personal Computer Diagnostic Aids program. Refer to the *IBM Personal Computer Guide to Operations* manual for the Diagnostic Aids program.

- *The personal computer program environment:* This is a description of what (if any) other programs or application programs were running or installed in storage at the time of the failure (for example, if there were any print spoolers or other interrupt handlers running at the time of the failure). Also identify the version of DOS and the emulation or IBM Token-Ring Network installed.
- *A copy of all batch files that ran before the problem occurred:* Print to the personal computer printer all batch files that were executed before the problem was encountered. This includes the AUTOEXEC.BAT file (if present), and the LINK36.BAT file.
- *A copy of the CONFIG.S36 file if it exists:* Copy the PC Support/36 configuration file, CONFIG.S36, and any alternate configuration files to a personal computer diskette and include the diskette with the APAR. If you wish, you can print the contents of the file to the personal computer printer.
- *A copy of any virtual disk or virtual printer setup files that were being used:* Copy to a diskette or printout any setup files that were being used with the CFGVDSK or CFGVPRT programs, and include the diskette with the APAR.
- *A copy of any translation tables that were being used:* Copy to a diskette any translation tables (ASCII to EBCDIC or EBCDIC to ASCII) that you were using when the problem occurred, and include the diskette with the APAR.

- If you were running a transfer request when the problem occurred, the following should be included:
  - *A description of the last request submitted:* Type the information and save it on a personal computer diskette. You can then print the information on the personal computer printer using the DOS TYPE command. You could also simply write down the information.
  - *A copy of the file(s) or libraries that were being transferred:* Copy the System/36 file(s) or library(s) that were being transferred at the time of the error to a System/36 diskette. If you were transferring data from the personal computer to the System/36, copy the personal computer file to a personal computer diskette, and include the diskette with the APAR.
  - *A copy of the personal computer File description file that was being used during the transfer:* Copy the personal computer File description file (if any) that was being used at the time of the failure to a diskette and submit that diskette with the APAR.
  - *A copy of the data dictionary that describes the file being transferred.*

- If you were using a virtual disk, the following should be included:
  - *A copy of the CONFIG.SYS file:* Copy the DOS configuration file, CONFIG.SYS, to a personal computer diskette or printout and include the diskette along with the APAR. This file is contained in the root directory of the diskette (or disk) from which you powered on your personal computer. If you want, you can print the contents of the file on a personal computer printer.
  - *A copy of the virtual disk file (or files) being used:* Copy to a System/36 diskette the System/36 file that contains the virtual disk being used at the time of the failure. If more than one virtual disk was being used, copy each file to the diskette. The file name is the same as the name you used to assign the virtual disk (using SETVDSK or CFGVDSK).

- If you were using a shared folder, the following should be included:
  - *A copy of the shared folders:* Use the SAVEFLDR command on the System/36 to save the folder that was being used when the failure occurred.
  - *A copy of the CONFIG.S36 file if it exists:* Copy the PC Support/36 configuration file, CONFIG.S36, and any alternate configuration files to a personal computer diskette and include the diskette with the APAR. If you wish, you can print the contents of the file to the personal computer printer.

- If you were using the Organizer, the following should be included:
  - *A copy of the shared folder:* Use the SAVEFLDR command on the System/36 to save the folder that was being used when the failure occurred.
  - *A copy of the CONFIG.S36 file if it exists:* Copy the PC Support/36 configuration file, CONFIG.S36, and any alternate configuration files to a personal computer diskette and include the diskette with the APAR. If you wish, you can print the contents of the file to the personal computer printer.

- If you were using a virtual printer, the following should be included:
  - *A copy of the file or the data that was being printed on a virtual printer:* Copy to a personal computer diskette the personal computer file or program data that was being copied to a virtual printer at the time of the failure. If incorrect virtual printer output is the problem, include a copy of the data as it should appear when printed on an actual personal computer printer, along with a copy of the incorrect output.
  - *A copy of the virtual printer parameters used for each active virtual printer:* Include a copy of the virtual printer parameters that were being used at the time of the failure. If the virtual printers were assigned using the CFGVPRT program, this information is contained in the CONFIG.S36 file or the user's own file. See "Using the PC Support/36 Virtual Printer Facility" in the *PC Support/36 User's Guide* for more information on user files. You should include this file with the APAR. If you assigned (or modified) the virtual printers using the SETVPRT program, you must obtain this information by running SETVPRT again to display the status of the virtual printers.

If possible, copy the information to the printer by pressing and holding the Shift key, then pressing the PrtSc key. Do not forget to also print off the advanced options parameters. If you cannot print this information on a printer, write down the necessary information.

- *A copy of the PTFLOG for the System/36:* Print the PTFLOG for the System/36 libraries #IWLIB and #LIBRARY.
- *The version numbers of any PC Support/36 programs that were running at the time of the failure:* When started, each PC Support/36 program displays its copyright and version number. Record the version number of the PC Support/36 programs that are running, and send this information along with the APAR. You may have to run the programs again (possibly after powering on the personal computer) in order to display the version numbers again.
- *Any other information:* Include any other information, such as history information, that may be useful in isolating and re-creating the problem.



# Applying a Program Temporary Fix (PTF)

PTFs for PC Support/36 are distributed on a System/36 PTF diskette. PTFs for the System/36 portion are applied like other System/36 PTFs, using the PTF procedure described in the System/36 manual *System Reference*. PTFs for the personal computer portion are applied as follows:

1. Apply the PTF to the PC Support/36 programs on the System/36 using the PTF procedure described in the manual *System/36 System Reference*.
2. You may receive a message indicating that the code on your personal computer needs a PTF applied. Refer to the recovery information in the *PC Support/36 Message Guide*.

# Running the DOS DEBUG Program

Because of the severity or complexity of some problems, it may be necessary to run the DOS DEBUG program to provide information in addition to that normally collected for the APAR. For example, it may be necessary to set address stops in the personal computer code, to dump a certain portion of the personal computer code, and so forth.

The DOS DEBUG program can be used to:

- Provide a controlled testing environment to monitor and control the execution of a program to be debugged. Problems in a program can be fixed, and then the program can be immediately run to determine if the problems were resolved. A program does not need to be reassembled to find out if the changes worked.
- Load, alter, or display any file.
- Execute object files. Object files are executable programs in machine language format.

# Setting an Address Stop

If you are required to set an address stop in a PC Support/36 program, use the DEBUG GO command.

*Note: You cannot use this method to debug VDSK.SYS.*

To set an address stop, do the following:

1. Make sure the program you plan to stop is running under DEBUG. To do this, type:

**d:DEBUG x:program.ext**

where **d:** is the letter of the diskette drive containing the DOS DEBUG program, **x** is the letter of the diskette drive containing the program you are debugging, and **program.ext** is the name and extension of the program you are debugging (for example, VPRT.COM).

2. Press the Enter key.
3. Set the address stop by typing:

**g xxxx**

where **xxxx** is the address stop you desire.

*Note: The address stop must be supplied by your service representative.*

4. An address stop at address **xxxx** is set and the program runs. The program continues to run until it reaches the instruction at address **xxxx**.
5. All 8088 registers are then displayed, and the DEBUG prompt, a dash (-), appears.

# Dumping Portions of Personal Computer Storage

If you are submitting an APAR, portions of personal computer storage should be dumped to your personal computer printer and sent along with the other APAR information. This information helps to determine the status and configuration of your computer, and makes it easier to re-create the problem.

If possible, this information should be gathered immediately after the problem occurs, so that valid status information can be collected. However, since gathering this information requires you to run the DEBUG program from the DOS prompt, certain situations such as a loop or hang will not allow you to gather the information using DOS DEBUG. You will have to re-create the problem after installing a debug tool, such as the Professional Debug facility, that allows you to invoke the debug functions while another program is in a loop or hung.

To dump the required information, do the following:

1. Run the DEBUG program from the DOS prompt as follows:

**d:DEBUG**

where **d:** is the letter of the diskette drive containing the DOS DEBUG program diskette.

2. Press the Enter key. The DEBUG prompt, a dash (-), appears and the DOS DEBUG program is now ready to accept commands.

3. Make sure the personal computer printer is powered on and the printer Ready light is on, and LPT1 is not assigned as a virtual printer.
4. Press and hold the Control key, then press the PrtSc key. Everything written to the personal computer display from now on is also written to the personal computer printer.
5. Write the 8088 registers to the printer. To do this, type the following:

**r**

6. Press the Enter key.
7. Dump the personal computer communications and data areas to the printer. To do this, type:

**d 0:0 L600**

*Note: It will take about 3 minutes to print this information on the IBM matrix printer.*

8. Next, dump the BIOS copyright area to the personal computer printer by typing the following:  
**d FFFF:0 L10**
9. Press and hold the Control key, then press the PrtSc key. The print screen function is disabled.
10. Include the information just printed with the APAR being submitted.

# Applying a Patch

If it is necessary to apply a patch, the following procedures guide you through the application of a temporary patch to PC Support/36.

The procedures differ slightly, depending on whether the patch is for a program with an extension of COM or SYS (such as STF.COM or VDSK.SYS), or an extension of EXE (such as RTOPCB.EXE). Therefore, each is described separately.

## Applying a Patch to a COM or SYS Program

The following example uses the STF.COM program to illustrate how to apply a patch to a program with the extension of COM or SYS. If you are required to patch a different PC Support/36 COM or SYS program, follow the same procedure, but substitute its name in place of STF.COM.

For example, assume the following temporary patch for program STF.COM is required:

At address 30FB in program STF.COM, the current bytes of C0 BA C8 are changed to EB 07 90.

You would use the following steps to apply the patch:

1. Make sure you have made a backup copy of the STF.COM program on another personal computer diskette.
2. After the DOS prompt, type the following:

**d:DEBUG x:STF.COM**

where **d:** is the letter of the diskette drive containing the DOS DEBUG program and **x** is the letter of the diskette drive containing the STF.COM program.

3. Press the Enter key. The DEBUG prompt, a dash (—), appears, and the DOS DEBUG program is now ready to accept commands.
4. Type:

**e 30FB**

5. Press the Enter key. The byte to be patched is displayed. Verify that this matches the current byte, specified in step 1. (In this example, the current byte is C0.)
6. If you make a mistake or the current byte did not match, you can end the DOS DEBUG program by using the DEBUG QUIT command. To do this, type:

**q**

Press the Enter key. Any changes made up to this point are not saved.

7. Apply the patch by typing each byte and pressing the space bar. When the last byte of the patch is typed, press the Enter key.

For example:

**EB** (space bar)  
**07** (space bar)  
**90** Press the Enter key.

The DEBUG prompt, a dash (-), is displayed again.

8. If the patch was entered correctly, write the patched version of the program back to diskette. To do this, type:

**w**

9. Press the Enter key. The following message should appear:

**Writing xxxx bytes**

Where **xxxx** is the size of the STF.COM program.

10. When the DEBUG prompt, a dash (-), appears, the write was successful.
11. You can terminate the DOS DEBUG program by using the DEBUG QUIT command. To do this, type:

**q**

12. Press the Enter key.



# Applying a Patch to an EXE Program

The following example uses the RTOPCB.EXE program to illustrate how to apply a patch to a program with the extension of EXE. If you are required to patch a different PC Support/36 EXE program, follow the same procedure, but substitute its name in place of RTOPCB.EXE.

For example, assume the following temporary patch for RTOPCB.EXE is required:

At address 30FB in RTOPCB.EXE, the current byte of 00 is changed to 01.

You would use the following steps to apply the patch:

1. Make sure you have made a backup copy of the RTOPCB.EXE program on another personal computer diskette.
2. After the DOS prompt, type the following:

```
RENAME x:RTOPCB.EXE  
x:RTOPCB.PCH
```

where **x** is the letter of the diskette drive where the diskette containing the RTOPCB.EXE program resides.

3. Press the Enter key. After the DOS prompt, type the following:

```
d: DEBUG x:RTOPCB.PCH
```

where **d:** is the letter of the diskette drive containing the DOS DEBUG program and **x** is the letter of the diskette drive containing the RTOPCB.PCH program.

4. Press the Enter key. The DEBUG prompt, a dash (–), appears, and the DOS DEBUG program is now ready to accept commands. Type:

**e 30FB**

The byte to be patched is displayed. Verify that this matches the current byte, specified in step 1. (For this example, the current byte is 00.)

5. If you make a mistake or the current byte did not match, you can end the DOS DEBUG program by using the DEBUG QUIT command. To do this, type:

**q**

Press the Enter key. Any changes made up to this point are not saved.

6. Apply the patch by typing each byte and pressing the space bar. When the last byte of the patch is typed, press the Enter key.

For example:

**01**      Press the Enter key

The DEBUG prompt, a dash (–), is displayed again.

7. If the patch was entered correctly, write the patched version of the program back to diskette. To do this, type:

**w**

8. Press the Enter key. The following message should appear:

**Writing xxxx bytes**

where **xxxx** is the size of the RTOPCB.PCH program.

9. When the DEBUG prompt, a dash (-), appears, the write was successful. You can end the DOS DEBUG program by using the DEBUG QUIT command. To do this, type:

**q**

10. Press the Enter key. Do not try to run the RTOPCB.PCH program until you type the following, after the DOS prompt:

**RENAME x:RTOPCB.PCH  
x:RTOPCB.EXE**

where **x** is the letter of the diskette drive where the diskette containing the RTOPCB.PCH program resides.

The patched program is now ready to be executed.

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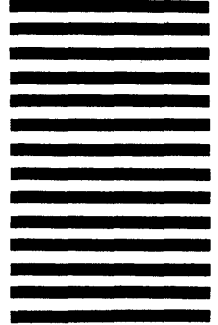
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