

THIS MANUAL IS CURRENT FOR  
MDBS 3.07

**MDBS**  
**Multiuser Supplement**  
**for**  
**TURBODOS**  
**(1.2 and Subsequent Versions)**

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## PREFACE

Although the great majority of MDBS features and facilities are independent of the host operating system and host programming languages, there are some system specific aspects. These include the installation procedures, execution command lines, DML command forms, and data item-host language variable correspondences. This manual, together with CP/M System Specific Installation Manuals, presents the system specific aspects that are needed in order to use MDBS DDL/DMS, MDBS-QRS, MDBS-RCV, MDBS-DMU and MDBS-IDML.

This manual consists of the following chapters:

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# I. INTRODUCTION

## A. Overview

This document is a supplement to the CP/M System Specific Installation Manuals describing multiuser operations under the TURBODOS operating system (version 1.2 and greater). It describes the needed steps for using MDBS III under the TURBODOS operating system.

The typical memory configuration during multiuser access of an MDBS data base is shown in Figure I-1. One memory bank contains MDBSDMS, the resident MDBS data management code that continuously executes to support run units which need to access the data base. This memory bank also contains program buffers which hold data base pages needed during MDBSDMS execution. Each of the other memory banks typically contains a run unit along with a small communication buffer.

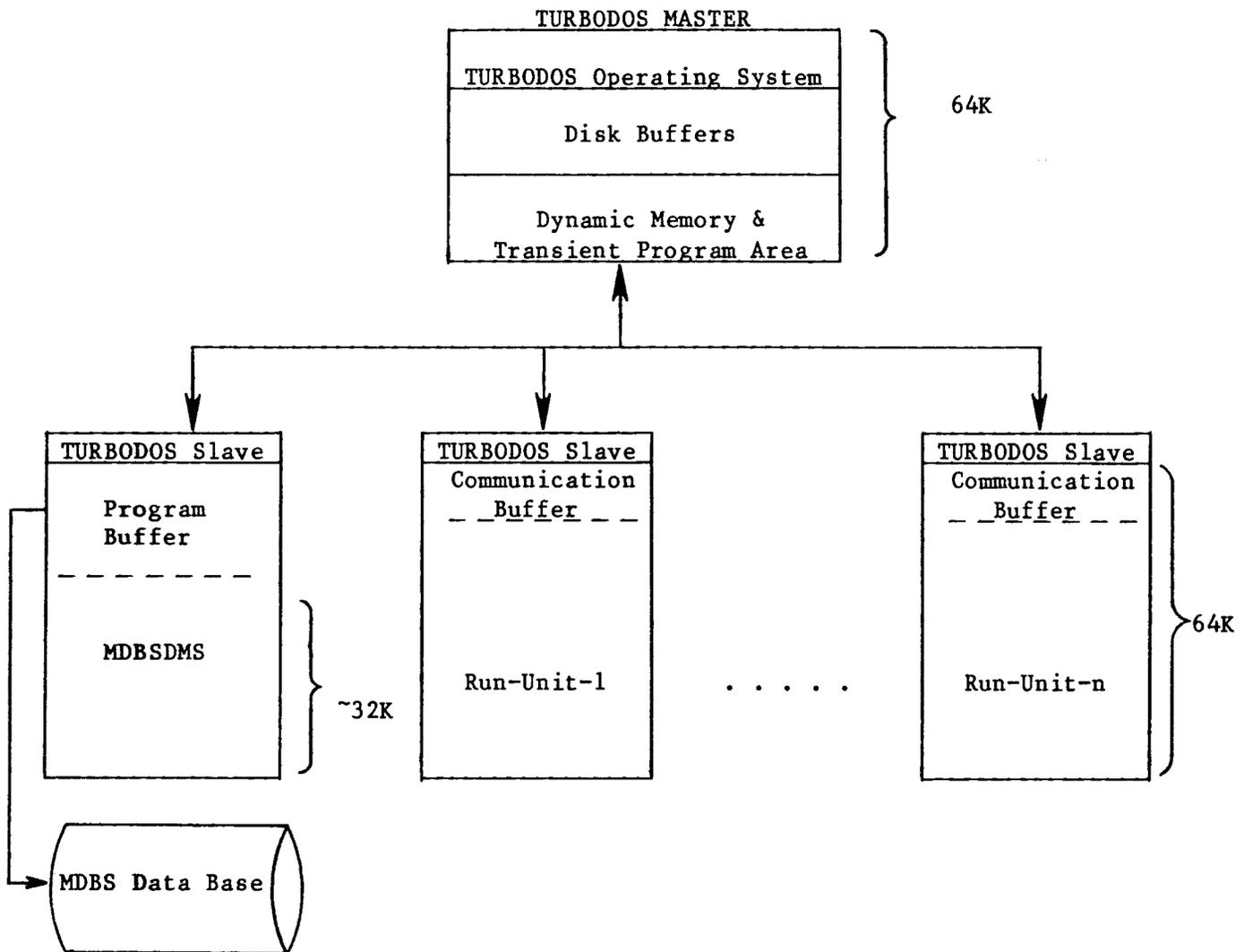


Figure I-1. Multiuser Access to an MDBS Data Base

The data management system (MDBSDMS) utilizes the TURBODOS RAM FIFO mechanism of dynamic memory. You may need to adjust the number of disk buffers to allow enough room for the dynamic memory portion of the TURBODOS master. However, it is desirable to avoid allowing more room than is necessary for dynamic memory. This adjustment can be made by regenerating the TURBODOS system or by using the BUFFERS operating system command. The nature of the adjustment (more or fewer disk buffers) is determined experimentally. It depends, in part, on the number of users and the existence of non-data base processing concurrently with data base processing.

## B. File Names for MDBS Software

With two exceptions, all files described in Section I-A of the CP/M System Specific Manual are provided with the multiuser version of MDBS. The exceptions are OS.REL and DMS.REL whose contents are different than those of the CP/M DMS.REL. Although the TURBODOS DMS.REL consists of DMS interface code (rather than a library of DMS routines), it is used in exactly the same manner as the CP/M DMS.REL during selective linking.

Four additional files are also provided:

DELAY15.COM	test program for TURBODOS delay process function
MDBSDMS.COM	resident data management code
DBMTR.COM	interactive multiuser administration utility
DBSVU.COM	buffer flush utility

If the RTL form of MDBS is to be used, then a file named MDBSRTL.COM is provided and replaces MDBSDMS.COM in the following procedures.

## C. User 0

Under TURBODOS the file system is partitioned by user number. Due to the design of TURBODOS, the following programs should always be run under user 0:

Resident DMS Code (MDBSDMS in Figure I-1)
MDBS.DDL (the DDL analyzer)
MDBS.DMU (the design modification utility)
MDBS.RCV (the recovery utility)

Note that a single copy of MDBSDMS is executing at any given moment in a TURBODOS environment. Since this resident DMS code operates against one data base at a time, each run unit must give the name of that data base (e.g., in the DBOPN command).

## D. Contention Count Defaults

See Chapter I of your MDBS III CP/M System Specific Manual.

## II. INSTALLATION

The installation of MDBS involves testing the TURBODOS Delay Process Function, starting the data base manager by executing MDBSDMS, and then executing individual run units.

### A. Checking the TURBODOS Delay Process Function

Under TURBODOS version 1.2, the multiuser data management system uses the TURBODOS Delay Process function call. This function is a part of standard TURBODOS, documented as function number 125 of the TURBODOS manual. DELAY15.COM is a program that checks to assure that the Delay Process function has been correctly implemented. Execute DELAY15.COM. If Delay Process is correctly implemented, the following three lines will be displayed:

```
MDBS III TurboDOS Delay Process Testing
This program will delay for approximately 15 seconds
Testing Completed
```

If the final line is not displayed after waiting for a substantial period of time, then the Delay Process function of your TURBODOS has not been correctly implemented and is not operating properly. You should contact your hardware/operating system vendor to ask them for instructions about how to make the Delay Process function operate properly.

### B. Booting the Data Management System

Under the TURBODOS operating system generated above, you now execute the resident data management code under user 0, as follows:

```
MDBSDMS -Bnnnn -Lfilename1 filename2
```

The -B and -L arguments are optional. The filename2 argument is required. It is the name of the physical file to which the main area of the desired MDBS data base has been assigned (in that data base's DDL source specification).

If the -B option is not used, MDBSDMS uses the entire remaining space of its memory segment for program buffers. If a smaller space of size nnnn decimal is desired, then use -Bnnnn on the command line. The -L option can be used in conjunction with RTL to specify the file (filename1) to which all transactions are to be logged. If this option is not used, transactions are logged to the log file as declared in the data base's DDL source specification. All filenames must be fully qualified.

When MDBSDMS has completed its initialization phase (depending on the current system load, this may take up to a minute), the following message is displayed:

```
MDBS III Data Management System Initiated
```

At this point, users may start their tasks. The console on which the message is displayed is dedicated to the data management system until another console terminates the MDBSDMS execution with the Close option of DBMTR (see Chapter IV of this manual).

**C. Executing a Run Unit**

The procedure for executing a run unit is identical to the procedure used in a CP/M environment (see Chapters II and VI of your CP/M System Specific Manual).

Note that run units are not restricted to application programs, but can also include executing instances of QRS and IDML. These are invoked as described in the CP/M System Specific Manual.

RCV and DMU cannot be executed in multiuser mode. When needed, they should be run under user 0 in single user mode.

### III. DML DIFFERENCE IN A MULTIUSER ENVIRONMENT

#### A. SETPBF

In a TURBODOS multiuser environment, SETPBF is invoked just as described in Chapter VII of the CP/M System Specific Manual. However, it has a different effect. Its argument indicates the size of the run unit's communication buffer (recall Figure I-1). The appropriate size is computed by the DDL Analyzer during data base initialization and is displayed by the DDL Analyzer with the label:

communication buffer size for multiuser environment

If your host language does not make use of SETPBF, then the above discussion of SETPBF invocation is of no concern to you.

#### B. Multiuser Commands

The multiuser commands described in Chapter XIV of the MDBS DMS Manual are available in a multiuser environment. Table III-1 shows the multiuser locking contention protocols. (This table supersedes Table XIV-1 of the DMS User's Manual for all manual revisions prior to and including Revision 82A).

**Table III-1. Multiuser Locking Contention Protocols**

Run Unit B attempts Run Unit A has	Find or retrieve locked record	Modify locked record	Create record	Connect record into set-2	Disconnect a record from set-2	Disconnect all member (owner) records from set-2	Delete record
Passive lock on a record	permitted	not permitted	not relevant	permitted	not permitted if A has the same CO and CM for set-2 as B	not permitted if A has the same CO(CM) for set-2 as B and CM(CO) of set-2 for A is non-null	not permitted
Active lock on a record	not permitted	not relevant	not relevant	not relevant	not relevant	permitted	not relevant
Active lock on all records of a record type	not permitted	not relevant	not permitted	not relevant	not relevant	permitted	not permitted
Active lock on all records of set-1	not permitted through set-1	not permitted if attempt to modify sort key value of set-1	not permitted if record is auto owner or member of set-1	not permitted if set-1 = set-2	not permitted if set-1 = set-2	not permitted if set-1 = set-2	not permitted if record is owner or member of set-1

The unit of time used with Turbodos for the DMS contention count command is one clock tick (i.e., 1/50 or 1/60 of a second). See the MCC command in the MDBS DMS Manual.

### C. Recovery Procedures

Since page posting is generally not meaningful in a multiuser environment, posting is not allowed with the multiuser version of MDBS. Thus the PIFD and TRABT commands should not be used. If used, they result in a command status message of 34, but have no other effect.

Because all run units log transactions to a single log file, the LGFILE command should not be used in a multiuser environment. It has no effect other than a command status of 34.

### D. DBSTAT

DBSTAT displays statistics for the aggregate of all run units.

### E. Exceeding the User Limit

If too many run units attempt to use the data base simultaneously, a command status of 67 (User Limit Exceeded) results from the DBOPN of the offending run unit.

### F. Buffer Flushing

To optimize speed under TURBODOS, the data management system does not perform automatic background buffer flushing. If periodic buffer flushing is desired, a terminal can be dedicated to the DBSVU utility while MDBSDMS is executing. DBSVU will flush the buffers periodically. This utility is invoked by entering:

```
DBSVU n
```

where n is a positive integer indicating the approximate number of seconds between flushes performed by DBSVU. If no n is specified, 300 is assumed.

Since DBSVU uses the DBSAVE command, it can generate the same command status numbers as DBSAVE. In addition, there are two other kinds of possible errors. One is a command line argument error that results from specifying a non-positive integer value for n. The other is a communication error which indicates that the DMS is not executing or a hardware/operating system error has been encountered.

DBSVU is terminated by pressing the Escape key or Control-C. If the data base is closed by DBMTR (see next Chapter) before terminating DBSVU, then DBSVU may hang and necessitate resetting the slave running DBSVU.

#### IV. ADMINISTRATION IN A MULTIUSER ENVIRONMENT

DBMTR is an interactive multiuser administration utility that can be executed simultaneously with various run units. It is not counted as a run unit. For 1 through 4 multiuser versions of MDBS, DBMTR can be executed at the same time that four run units are executing. It is invoked by entering

##### DBMTR

on the operating system command line. DBMTR responds with the following prompts:

MDBS Multi-User Data System Monitor Ver. 3.00  
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##### Option Summary:

Stats: display communication and operational statistics  
Reset: reset communications  
Close: close data base and shut down communications  
Logout: log out one or more users from the data base system  
Quit: exit monitor

Option (Stats, Reset, Close, Logout, Quit) ?

##### A. Stats

Paging statistics are displayed with respect to the entire multiuser environment (i.e., aggregate of all run units). These statistics are identical to those provided by the DBSTAT command (see MDBS DMS Manual).

In addition, the TURBODOS user number is displayed.

##### B. Reset

This function is used in the case of inadvertent or untimely termination of a run unit. It resets the FIFOs used for inter-task communication.

##### C. Close

This function terminates execution of MDBSDMS.

##### D. Logout

If a run unit terminates before invoking DBCLS, this function can be used to force a data base close for that run unit.

**E. Quit**

This function exits the multiuser administration monitor.

**F. Batch Usage of DBMTR**

Any of the five options described above can be specified on the command line that invoked DBMTR, by indicating the first letter of the desired option. For instance,

**dbmtr s**

executes DBMTR with the statistics option. When an option is specified on the command line, the menu is not displayed and there is an automatic exit from DBMTR after the option's task is completed.

Multiple options can be specified with no separators. The options are processed in the order in which they are specified. (If one of the options causes processing to terminate, then the remaining specified options are ignored.) For instance,

**dbmtr ls**

performs the logout option and then the statistics option, before automatically exiting from DBMTR.

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