

TX990/TXDS RELEASE INFORMATION, RELEASE 2.3

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+++ CONTENTS +++

PROBLEM NOTIFICATION



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A

2250084-9901

SHEET 2

REV

A

The following is a list of known TX990/TXDS problems:

1. If a FORTRAN task (or any other task created with an "END" vector) is linked after the module 'TXEND' the END vector in the task will override the entry vector supplied by the operating system. The system loader will branch to the entry point of the task rather than the operating system when the system is first loaded. This problem may be solved by placing a new module after the last module to be linked. This new module should consist of the following code:

```
          IDT  'ENDVEC'  
          REF  ENDTX  
START B   @ENDTX          OPERATING SYSTEM ENTRY POINT  
          END  START
```

This module should be created with the TXEDIT and assembled with TXMIRA.

Another problem with linking FORTRAN programs with the TX operating system is that the DSEG generated by the FORTRAN compiler will be placed after the 'TXEND' module. To correct this problem a new Link Editor command exists. Before the include for 'TXEND', place the command ALLOCATE which will cause the DSEG from the already included FORTRAN program to be positioned before 'TXEND'. If several FORTRAN programs are being linked, one allocate command after the last include of a FORTRAN program will position all the DSEGS.



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2250084-9901

SHEET 3

REV

A

2. SOME TASKS (OR FORTRAN PROGRAMS THAT USE ACCEPT AND DISPLAY CALLS) REQUIRE A STATION ID OR OTHER PARAMETERS PASSED TO THE TASK IN THE "BID TASK SUPERVISOR CALL BLOCK" WHEN THE TASK IS EXECUTED. IF THIS TASK IS LINKED IN THE SYSTEM SO THAT IT IS ACTIVE AT SYSTEM LOAD TIME OR MANUAL RESTART THERE IS NO WAY TO PASS THE PARAMETER(S) TO THE TASK SINCE THE "BID TASK SUPERVISOR CALL" IS NOT USED. THIS PROBLEM MAY BE SOLVED BY LINKING ANOTHER TASK AND PASS THE REQUIRED PARAMETERS IN THE BID TASK CALL BLOCK.

3. WHEN WRITING SHORT RECORDS TO THE CASSETTE, LESS THAN 20 CHARACTERS, THE HARDWARE BUFFERS IN THE 733 ASR MAY BE OVERWRITTEN BEFORE THE DATA CAN BE TRANSFERRED TO THE TAPE. THE USER MAY AVOID THIS PROBLEM BY COPYING THE FILE WITH THE SHORT RECORDS TO THE CASSETTE WITH THE COPY/ CONCATENATE PROGRAM, TXCCAT, WITH THE FILL OPTION SPECIFIED. THE FILL OPTION WILL BLANK FILL THE RECORD TO THE DESIRED LENGTH. REFER TO THE TXDS PROGRAMMER'S GRIDE FOR AN EXPLANATION OF HOW TO USE TXCCAT.

4. WHEN TXSLNK IS USED TO LINK A TASK WITH A PROCEDURE, AND THE LINKED OUTPUT IS NOT WRITTEN TO A PROGRAM FILE, THE TASK WILL BE LOADED INCORRECTLY BY TX990. TO CORRECTLY LINK TASKS AND PROCEDURES WHICH ARE TO BE OUTPUT ON SEQUENTIAL FILES (I.E. AS OBJECT CODE) USE TXLINK. REFERENCES IN AN ASSEMBLY LANGUAGE PROCEDURE TO SYMBOLS WITHIN A TASK SEGMENT MAY ALSO BE RESOLVED WITHOUT LINKING BY INCLUDING A DUMMY TASK MODULE IN THE PROCEDURE BEFORE ASSEMBLY SHOWN:

```

      IDT   'PROC1'
      DORG  0
      :
      TASK SEGMENT
      :
      RORG  )
START EQU  $
      :
      PROCEDURE SEGMENT
      :
      END

```



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2250084-9901

SHEET 4

REV

A

5. NOTICE OF CHANGES TO TX 2.3 LINK EDITOR

This notice describes the changes made to the Link Editor available on TX 2.3. These changes will be included in the revised Link Editor Reference Manual dated after October 1, 1978.

The changes affect the following commands:

INCLUDE
LIBRARY
SEARCH
NOAUTO
FIND

These changes make sequential libraries functionally equivalent to random libraries.

INCLUDE COMMAND

The INCLUDE command defines modules or files of modules that are to be included in a phase. The command is required in each phase of a task or procedure, and more than one INCLUDE command may be used, as needed. However, no INCLUDE is required after a TASK command if the procedure defined contains data segments (DSEG) or common segments (CSEG). These segments are included in the task by the Link Editor. The syntax for the command is as follows:

INCLUDE [<acnm>][,<acnm>][...]¹

When the control stream is read from a card reader and the INCLUDE command has no operand, the module or modules follow the INCLUDE command in the control file, and each module is terminated with a record having a colon (:) in the first character position. The last module is followed by an end-of-file record (/*). When used, the <acnm>, or pathname, specifies a file or device that contains one or more of the modules for the phase. If the name is enclosed in parentheses, the Link Editor searches all defined libraries in the order they are defined to locate the file named as the operand of the INCLUDE command. For random libraries (DX10 only), the Link Editor searches for an entry in the library directory which equals the operand of the INCLUDE command. For sequential libraries (DX10 and TXDS), the Link Editor searches the library for a zero (0) tag (refer to Appendix F or to a link map example under MODULE) which equals the file named as the operand of the INCLUDE command. The following examples show the use of the INCLUDE command:

INCLUDE Includes the module(s) that follow this command in the control file.

object records

:

.

:

.

/* (EOF)

INCL CATA.APPL.OBJ.MODS Includes the module(s) in the DX10 file MODS on the volume CATA.

¹At least one blank must precede the first <acnm>.



INCL CS02 Includes the module(s) in the file on cassette unit two.

INCL (X) Search DX10 random libraries for a file named X and include the modules in X.

 Search DX10 or TXDS sequential libraries for a zero (0) tag with a program ID of X and include the modules in X.

INCL DSC2:FILE/OBJ Include a TXDS file (TXDS only).

LIBRARY COMMAND

The LIBRARY command specifies the random or sequential libraries which will be searched to satisfy unresolved external references in the module to be linked. The syntax for the command is:

LIBRARY <acrm>[,<acrm>][...]

The <acrm> parameters define the pathname to the library that contains the desired files. These files must consist of object code produced by the assembler or higher level language compilers or previous output of the Link Editor. The following are examples of the LIBRARY command:

LIBR CATA.APPL.OBJ

LIBRARY CATA.APPL.SEQLIB

LIBR DSC2:TXLOBJ/LIB

In the first two examples above, CATA is the DX10 volume ID and APPL is the DX10 directory name. The subdirectory name, OBJ, indicates that the library is a random library. The file name, SEQLIB, indicates that the library is a sequential library. In the third example, DSC2 is the TXDS device name, TXLOBJ is the file name, and LIB is the file qualifier or extension. TXDS <acrm> parameters define sequential libraries only.

SEARCH COMMAND

The SEARCH command directs the Link Editor to perform a search of a library at this point in the control stream rather than after all the control stream commands have been processed. The syntax of the command is as follows:

SEARCH [<acrm>] [, <acrm>] [...]

with the <acrm> parameters being the access names of the libraries that are to be searched. The order of these access names determines the order of the search. If no <acrm> parameters are specified the libraries defined by the LIBRARY commands define the search ordering.

An example of the use of a SEARCH command is shown by the following example. The program being linked requires that a particular module, MODA, be the last module included in the linked output. Prior to the last INCLUDE command, the

SEARCH command is used to resolve references in the libraries. This sequence is necessary since automatic resolution occurs at the end of the entire Link Edit, and any modules included to resolve references would otherwise have been placed after MODA in the linked output.

```
LIBR          VOL2.MODS.EXAM1.VOL3.MOD.EXAM2
TASK          A
INCL          (MODB)
INCL          (MODC)
SEARCH
INCL          (MODA)
END
```

NOAUTO COMMAND

Specification of the NOAUTO command inhibits the performing of automatic external reference resolution, even if LIBRARY commands are included in the control stream. The NOAUTO command allows the user to explicitly control library searching through use of the SEARCH command. The syntax of the command is as follows:

```
NOAUTO
NOAU
```

FIND COMMAND

The FIND command is used to specify sequential libraries that contain input modules for the Link Editor. The command can be used on both DX10 and TXDS, but it cannot specify a random library. A SEARCH command must be used to specify a random library. The FIND command specifies the library that is to be searched for user controlled external reference resolution. The syntax of the command and examples are as follows:

```
FIND <acnm>
FIND DSC2:TXLOBJ/LIB          TXDS example
FIND MYDISC.DIRA.MODS        DX10 example
```

Due to the way in which sequential libraries are searched, certain constraints apply. Only one pass is made through the library to resolve references, so if one module references a previous module in the library, that reference is not resolved unless the referenced module has already been included.

For example, if a library is structured as follows:

```
MODA  MODB  MODC
```

and MODB references MODA, that reference would only be resolved if MODA had been previously included by an INCLUDE command or by symbol resolution. References from MODB to MODC would be resolved by the FIND command.



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| DOCUMENT NUMBER | REVISION | SHEET |
|-----------------|----------|-------|
| 2250084-9901 | A | 7 |

Unresolved references can be handled by using two FIND commands with the same pathname. For example, if the library containing MODA, MODB, and MODC has a TX990 pathname of DSC2:TXLOG/LIB and MODB references MODA, which has not been previously included, two FIND commands would solve the reference as follows:

```
.  
. .  
. .  
. .  
INCL DSC1:MODD/OBJ; REFERENCES MODB  
  
FIND DSC2:TXLOG/LIB; INCLUDES MODB WHICH REFERENCES MODA  
  
FIND DSC2:TXLOG/LIB; INCLUDES MODA  
  
END
```

The FIND command is printed in the link map as a SEARCH command.

SAMPLE CONTROL FILES

| TX 2.2 | TX 2.3 |
|-------------------------|-------------------------|
| FORMAT IMAGE | FORMAT IMAGE |
| TASK TICTAC | LIBRARY DSC2:TXLOBJ/LIB |
| INCLUDE DSC2:TICTAC/OBJ | TASK TICTAC |
| FIND DSC2:TXLOBJ/LIB | INCLUDE DSC2:TICTAC/OBJ |
| END | END |

The TX 2.2 control file will work on TX 2.3.

SAMPLE CONTROL FILE USING OVERLAYS

| TX 2.2 | TX 2.3 |
|----------------------|-------------------------|
| NOSYMT | NOSYMT |
| NOPAGE | NOPAGE |
| FORMAT IMAGE | FORMAT IMAGE |
| TASK LOVMTST | LIBRARY DSC2:TXLOBJ/LIB |
| INCLUDE DSC:MAIN/OBJ | TASK LOVMTST |
| LOAD | INCLUDE DSC:MAIN/OBJ |
| FIND DSC2:TXLOBJ/LIB | LOAD |
| PHASE 1,A | PHASE 1,A |
| INCLUDE DSC:SUBA/OBJ | INCLUDE DSC:SUBA/OBJ |
| FIND DSC2:TXLOBJ/LIB | PHASE 2,D |
| PHASE 2,D | INCLUDE DSC:SUBD/OBJ |
| INCLUDE DSC:SUBD/OBJ | PHASE 3,G |
| FIND DSC2:TXLOBJ/LIB | INCLUDE DSC:SUBG/OBJ |
| PHASE 3,G | PHASE 3,H |
| INCLUDE DSC:SUBG/OBJ | INCLUDE DSC:SUBH/OBJ |
| FIND DSC2:TXLOBJ/LIB | PHASE 3,I |
| PHASE 3,H | INCLUDE DSC:SUBI/OBJ |
| INCLUDE DSC:SUBH/OBJ | PHASE 2,E |



```

FIND DSC2:TXLOBJ/LIB
PHASE 3,I
INCLUDE DSC:SUBI/OBJ
FIND DSC2:TXLOBJ/LIB
PHASE 2,E
INCLUDE DSC:SUBE/OBJ
FIND DSC2:TXLOBJ/LIB
PHASE 2,F
INCLUDE DSC:SUBF/OBJ
FIND DSC2:TXLOBJ/LIB
PHASE 1,B
INCLUDE DSC:IFUNC/OBJ
FIND DSC2:TXLOBJ/LIB
PHASE 1,C
INCLUDE DSC:SUBC/OBJ
FIND DSC2:TXLOBJ/LIB
END

```

```

INCLUDE DSC:SUBE/OBJ
PHASE 2,F
INCLUDE DSC:SUBF/OBJ
PHASE 1,B
INCLUDE DSC:IFUNC/OBJ
PHASE 1,C
INCLUDE DSC:SUBC/OBJ
END

```

The TX 2.2 control file will take longer to run than the TX 2.3 control file.

LINK MAP CHANGES

On the following page is an example of a link map. The areas circled show the new features of the TX 2.3 Link Editor. Circle A indicates that the module F\$XPRES came from library number 1 and that a FIND or SEARCH command caused F\$XPRES to be included. Circle B indicates that library number 1 is a sequential library with the name DSC2:TXLOBJ/LIB. For each FIND or SEARCH command a new number is generated. A LIBRARY command will also cause a number to be generated. Circle C indicates that a label was on the END statement when it was assembled. This generates a 2 tag which defines the module's entry point.



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| DOCUMENT NUMBER | REVISION | SHEET |
|-----------------|----------|-------|
| 2250084-9901 | A | 9 |

CONTROL FILE = DSC:LOVM/CTL

LINKED OUTPUT FILE = DSC:LOVM/SYS

LIST FILE = DSC:MAP/

NUMBER OF OUTPUT RECORDS = 50

OUTPUT FORMAT = IMAGE

LIBRARIES

| NO | ORGANIZATION | PATHNAME |
|----|--------------|-----------------|
| 1 | SEQUENTIAL | DSC2:TXLOBJ/LIB |
| 2 | SEQUENTIAL | DSC2:TXLOBJ/LIB |
| 3 | SEQUENTIAL | DSC2:TXLOBJ/LIB |
| 4 | SEQUENTIAL | DSC2:TXLOBJ/LIB |
| 5 | SEQUENTIAL | DSC2:TXLOBJ/LIB |
| 6 | SEQUENTIAL | DSC2:TXLOBJ/LIB |
| 7 | SEQUENTIAL | DSC2:TXLOBJ/LIB |
| 8 | SEQUENTIAL | DSC2:TXLOBJ/LIB |
| 9 | SEQUENTIAL | DSC2:TXLOBJ/LIB |
| 10 | SEQUENTIAL | DSC2:TXLOBJ/LIB |

PHASE 0, LOVMTST ORIGIN = 0000 LENGTH = 252E (TASK ID = 1) ENTRY=0000

| MODULE | NO | ORIGIN | LENGTH | TYPE | DATE | TIME | CREATOR |
|-----------|----|--------|--------|-----------|----------|----------|---------|
| \$MAIN | 1 | 0000 | 0108 | INCLUDE | 01/00/00 | 00:11:22 | TXFTN |
| \$DATA | 1 | 1D20 | 0038 | | | | |
| L\$QVM | 2 | 0108 | 0176 | INCLUDE | 10/31/77 | 19:35:38 | SDSMAC |
| \$DATA | 2 | 1D58 | 0070 | | | | |
| F\$XPRES | 3 | 027E | 0718 | SEARCH, 1 | 12/22/77 | 08:40:18 | SDSLNK |
| \$DATA | 3 | 1DC8 | 01CE | | | | |
| F\$REVP | 4 | 0996 | 000C | SEARCH, 1 | 11/01/77 | 19:24:40 | SDSLNK |
| F\$RINP | 5 | 09A2 | 0074 | SEARCH, 1 | 11/01/77 | 21:21:36 | SDSLNK |
| F\$FINPTX | 6 | 0A16 | 0B08 | SEARCH, 1 | 11/01/77 | 22:07:13 | SDSLNK |
| F\$XIOF | 7 | 151E | 013C | SEARCH, 1 | 11/01/77 | 21:28:20 | SDSLNK |
| F\$XREL | 8 | 165A | 001A | SEARCH, 1 | 12/01/77 | 16:10:24 | SDSLNK |
| F\$FLT | 9 | 1674 | 00A4 | SEARCH, 1 | 11/01/77 | 19:38:27 | SDSLNK |
| F\$PASR | 10 | 1718 | 0360 | SEARCH, 1 | 11/01/77 | 19:34:48 | SDSLNK |
| F\$FIX | 11 | 1A78 | 00C4 | SEARCH, 1 | 11/01/77 | 19:37:49 | SDSLNK |
| F\$ERRC | 12 | 1B3C | 013C | SEARCH, 1 | 11/01/77 | 20:55:38 | SDSLNK |
| F\$XERR | 13 | 1C78 | 000A | SEARCH, 1 | 11/01/77 | 21:26:32 | SDSLNK |
| F\$XTBLTX | 14 | 1C82 | 0000 | SEARCH, 1 | 11/01/77 | 22:13:21 | SDSLNK |
| \$DATA | 14 | 1F96 | 01E0 | | | | |
| \$XFTLTX | 15 | 1C82 | 0005 | SEARCH, 1 | 11/01/77 | 22:11:44 | SDSLNK |
| F\$XFCB | 16 | 1C88 | 0000 | SEARCH, 1 | 11/01/77 | 21:26:56 | SDSLNK |
| \$DATA | 16 | 2176 | 00C8 | | | | |
| F\$RBUF | 17 | 1C88 | 0000 | SEARCH, 1 | 11/01/77 | 21:01:48 | SDSLNK |
| \$DATA | 17 | 223E | 008E | | | | |

6.0 Data may be destroyed on a diskette if power is removed from the CPU or the diskette drive in which the diskette is loaded.



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2250084-9901

SHEET 11

REV

A

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Addition to TX990 Release 2.3.0 Release Information 2250084-9901 09/22/78

6.1 Four additional configured system diskettes are included in the TXDS Release 2.3.0 software package. Three of the configurations are for the 990/5 Computer, and one is for the 774 Intelligent Terminal System. The configurations of these and the other configured system diskettes are given in the TXDS Program Documentation Package, part number 2261734-0001.

The 990/5 configured diskettes may be loaded in the manner described in the TX990 Operating Systems Programmer's Guide, Release 2, part number 946259-9701, paragraph 2.2.1, "LOADING FROM DISKETTE."

The 774 configured diskette may be loaded as follows:

1. Remove any diskettes which may be loaded in the diskette drives.
2. If the power switch on the 774 system controller is lighted, press it to turn it off.
3. Insert the 774 Configured System Diskette (part number 2250446-1640) into a diskette drive.
4. Depress the power switch on the 774 system controller to turn it on. After a few seconds a red light on the diskette drive will light, indicating that the diskette is being read.
5. After the system has been loaded, the TX990 system identification message will be displayed on VDT station 1. Proceed with the initialization of the system as described in the Programmer's Guide, paragraph 2.3.2, "INITIALIZATION USING THE CONTROL PROGRAM."



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2250084-9901

SHEET 12

REV

A

7. THE PROM PROGRAMMER GOES INTO A LOOP WAITING FOR A BIT TO CHANGE STATE BEFORE DOING THE BURN. IT IS POSSIBLE FOR THIS STATE CHANGE TO OCCUR DURING A CLOCK INTERRUPT CAUSING THE PROGRAM TO NEVER DETECT THE STATE CHANGE.

THIS PROBLEM CAN BE CORRECTED BY PROCEDURE 7.1 IF 'OCP' IS AVAILABLE OR PROCEDURE 7.2 IF TXDS IS IN USE.

7.1

1. BOOT THE SYSTEM AND INVOKE OCP BY TYPING ! .
2. LOAD THE TXPROM PROGRAM BY:
LP,DSC2:TXPROM/SYS (DSC2 MAY BE ANY DISK)
3. USE THE 'ST' COMMAND TO GET THE START ADDRESS OF THE PROGRAM BY:
ST,10
4. CALCULATE THE THE PATCH ADDRESS BY:
AD,<CADR>,17A8
5. VERIFY THE CONTENTS OF THE CALCULATED ADDRESS, <CADR>, BY:
DM,<CADR>

THE FIRST TWO VALUES DUMPED SHOULD BE 1FOF,16FE.
6. CHANGE THE CONTENTS OF <CADR> AND <CADR>+2 TO 1000 BY:
LM,<CADR>,1000,1000

THE PATCH IS COMPLETE. IT MAY BE VERIFIED BY EXECUTING STEP 5 AGAIN EXPECTING THE FIRST TWO VALUES TO BE 1000,1000.

7.2

1. BOOT THE SYSTEM AND INVOKE THE CONTROL PROGRAM BY TYPING ! .
2. FROM A LINK MAP OF THE SYSTEM, FIND THE VALUE OF THE SYMBOL 'ENDTX'. ADD THE VALUE OF 'ENDTX' TO >1848 TO DETERMINE THE PATCH ADDRESS <PADR>.
3. LOAD THE TXPROM PROGRAM BY:
PROGRAM: :TXPROM/*
4. WHEN THE TXPROM PROGRAM IDENTIFIES ITSELF PRESS THE HALT SWITCH ON THE FRONT PANEL.
5. ENTER THE PATCH ADDRESS <PADR> FROM STEP 2 IN THE THE PANEL ADDRESS SWITCHES AND PRESS THE 'MA ENTER' (MEMORY ADDRESS) SWITCH.
6. VERIFY THE CONTENTS OF THE FIRST TWO WORDS AT THE PATCH ADDRESS.



PRESS THE 'MDD' (MEMORY DATA DISPLAY) SWITCH. THE VALUE >1FOF SHOULD BE DISPLAYED IN THE MEMORY LIGHTS. PRESS THE 'MAI' (MEMORY ADDRESS INCREMENT) SWITCH. PRESS THE 'MDD' SWITCH. THE VALUE OF >16FE SHOULD BE DISPLAYED. WHEN THE CORRECT PATCH ADDRESS IS VERIFIED, GO TO STEP 7.

7. ENTER THE PATCH DATA.

ENTER THE PATCH ADDRESS <PADR> FROM STEP 2 IN THE PANEL ADDRESS SWITCHES AND PRESS THE 'MA ENTER' SWITCH.

PRESS THE 'CLR' (CLEAR) SWITCH. ENTER THE VALUE >1000 IN THE PANEL ADDRESS SWITCHES AND PRESS THE 'MDE' (MEMORY DATA ENTER) SWITCH.

PRESS THE 'MAI' SWITCH. PRESS THE 'MDE' SWITCH.

THE PATCH IS COMPLETE. IT MAY BE VERIFIED BY EXECUTING STEP 6 AGAIN EXPECTING THE DATA DISPLAYED TO BE >1000.



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DOCUMENT NUMBER

2250084-9901

REVISION

A

SHEET

14 of 14