



RT-11/85 MUBASIC V1
SYSTEM RELEASE NOTES

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REV B

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 ***** RT-11/85 MUBASIC V1 *****
 ***** SYSTEM RELEASE NOTES ***** Rev B
 ***** Pub no. 60-0041-001

The following documents and disks are contained in the Terak version of the DEC MUBASIC system software. If any items are missing, contact the Terak Software Service Group.

DOCUMENTS:

1. RT-11/85 MUBASIC V1 RELEASE NOTES, (this document)
2. BASIC-11 LANGUAGE REFERENCE MANUAL, DEC-11-LIBBA-B-D
3. MUBASIC / RT-11 SYSTEM INSTALLATION GUIDE, DEC-11-LIBMA-A-D
4. MUBASIC / RT-11 USER'S MANUAL, DEC-11-LIBRA-A-D
5. MUBASIC GRAPHICS EXTENSIONS V1 RELEASE NOTES, Terak # 60-0040-001
6. STRING ARITHMETIC (SMATH) SOFTWARE SPECIFICATION, Terak # 60-0018-001
7. 2 each 8510/a SYSTEM REFERENCE CARD, Terak # 60-0022-001

DISKS:

1. MUBAS SYSTEM DISK {Object files to build non-extended MUBAS}
2. MUBAS SYSTEM EXTENSIONS DISK {GRAPHICS and SMATH object files}
3. MUBAS DEMONSTRATION DISK {Ready to run, with demonstrations}

Upon receiving these disks, the manager of the software installation site should immediately:

- 1) scan each disk for damaged data,
- 2) verify the directory contents of each disk, and
- 3) make a backup copy of each disk.

These procedures are documented in the RT-11 System User's Guide, and are summarized, for convenience, below. Note that these procedures apply for RT-11 V20 and systems with at least two disk drives. If V3b or later is in use, consult the User's Guide. If only a single disk drive system is available, use the following procedures as an outline, while following correct procedures for use of the single disk drive handler (see System Generation Manual).

NOTE: In the following procedures, character sequences to be typed or observed are enclosed in single quotes. The expression <Control-X>, where X is a letter, indicates that the control key is to be depressed, then the indicated letter key is to be typed. The expression <XXX> indicates that the XXX key is to be typed; for example, the expression <return> indicates that the return key is to be typed.

INSPECTION OF DISKS FOR DAMAGED DATA

The demonstration disk (61-0002-003) may be bootstrapped by pressing the power switch upward, and then releasing, and then mounting the disk into disk drive QX0. Type 'R PIP <return>'. The response '*' will be displayed. To scan the demonstration disk for damaged data, type 'QX0:/K <return>'. To scan for damaged data on the other disks in the software kit, mount the selected disk into disk drive QX1 and type 'QX1:/K <return>'. In either case, after about a half minute, the response '*' should be displayed. If the scanning does not complete, or any message such as 'BLOCK XX IS BAD' is displayed, data on the disk may have been damaged. Contact the Terak Software Service Group.

INSPECTION OF DIRECTORY CONTENTS OF DISKS

The demonstration disk (61-0002-003) may be bootstrapped by pressing the power switch upward, then releasing it, and then mounting the disk into disk drive QX0. Type 'R PIP <return>'. The response '*' will be displayed. To display the directory of the demonstration disk, type 'QX0:/E <return>'. To display the directory of the other disks in the software kit, mount the selected disk into disk drive QX1 and type 'QX1:/K <return>'. In either case, the disk directory will be displayed on the screen. To hold the scrolling of the display, type <Control-S>; to release scrolling, type <Control-Q>. The directory of each disk is provided later in this document, and should be compared with the directory displayed. If any differences are found, contact the Terak Software Service Group.

QB
etc

PROCEDURE TO COPY (BACKUP) AN ENTIRE DISK

The demonstration disk (61-0002-003) may be bootstrapped by pressing the power switch upward, then releasing it, and then mounting the disk into disk drive QX0. Type 'R PIP <return>'. The response '*' will be displayed. Mount a blank disk into drive QX1. To copy a disk other than the demonstration disk, remove the demonstration disk from drive QX0, and mount the source disk into drive QX0. To copy the demonstration disk, leave it in drive QX0. Now type 'QX1:Z=QX0:/S <return>'. The copying onto the target disk will proceed, and complete in about a half minute.

If a disk other than the demonstration disk was copied by the above procedure, remove the source disk from drive QX0, and remount the demonstration disk into drive QX0.

If the demonstration disk was copied by the above procedure, do the following. Type <ETX>. The response 'C' and '.' will be displayed. Type 'R TKBOOT <return>'. The response 'ENTER DISK UNIT TO RECEIVE BOOTSTRAP:' will be displayed. Inject a bootstrap into the copy disk by typing '1 <return>'. The response '.' will be displayed. Type 'R PIP <return>'. The response '*' will be displayed.

In either case, next scan the target disk for valid data by typing 'QX1:/K <return>'. The response '*' should be displayed. If the scanning does not complete, or any message such as 'BLOCK XX IS BAD' is displayed, data on the target disk is not valid, and you should repeat the above procedure. If target disk data is still not valid, use a different target disk, and repeat the above procedure. If data is still not valid, contact the Terak Software Service Group.

Label the target disk. When all disks in the software kit have been copied, remove the original disks to a safe place.

DEMONSTRATING THE MUBASIC SYSTEM

Following this, the 'MUBASIC Demonstration' disk may be run to exercise the example programs. For users just beginning with Basic, a review of the Basic Language Reference Manual is suggested. For more advance programmers, the User's Manual should be studied for a review of system and I/O extensions. For graphics programmers, studying the Graphics Extensions Release Notes is advised. For SMATH users (typically business programming), see the SMATH SPEC.

To demonstrate MUBASIC and its extensions, bootstrap the copy of the Demonstration Disk (61-0002-003), by pressing the power switch upward, and then releasing, and then mounting the disk into disk drive QX0. Enter the Date and Time, e.g. 'DATE 12-JUL-79 <return>' and 'TIME 21:25 <return>', and then type 'R MUBAS <return>'. The response 'Configuration File -- Old, New, or None' will be displayed. Type 'O <return>'. The response 'File Name --' will be displayed. Type '1USER <return>'. After a moment, the response 'READY' will be displayed.

error in CATLOG
 changed to 50 PRINT \ OPEN "QX" ... etc
 to 50 PRINT \ OPEN "DK" ... etc

You are now in MUBASIC. As a first step, to list all Basic programs in the disk directory, type 'RUN CATLOG <return>'. The response 'QX UNIT NUMEER:' will be displayed. Type '0 <return>'. The response 'USER ID' will be displayed. Type 'AS <return>'.

To run any of the example programs, type 'RUN XXXXXX <return>', substituting the program title, without the '.BAS' extension, for XXXXXX. To stop a program, type <Control-C>, or <ETX>. After stopping a program, you may type <Control-L>, or <down-arrow> to clear the screen, and reset the panning rate. To list a program, type 'LIST <return>'. To exit MUBASIC, type 'BYE <return>'.

SELECTING OR BUILDING DIFFERENT VARIATIONS OF MUBASIC

Multiuser BASIC can be built in many different variations depending on the need of the user. Generally, one variation is selected based upon a tradeoff of memory space, functionality, and response speed. For example, the standard version of BASIC with TERA 8510/a graphics support uses approximately 3.2K more memory than the same version without graphics. The implication to the user is that less memory space is available for programs and data.

The MUBASIC Graphics extensions provide the user with control of the Terak 8510/a graphics display. A subset of the ACM SIGGRAPH standard is provided. The MUBASIC Smath extensions provide the user with four function arithmetic, operating on numbers represented in strings, with 16 digit precision. Smath is vital to accounting use.

MUBASIC is linked from the object files contained in either disk 1 or 2 of the software kit. Linking can be done by manually entering a command to LINK, or by running BATCH to convert a control file to such commands. The major options available are:

1. FORGROUND or BACKGROUND operation.
2. OVERLAID or NON-OVERLAID structure.
3. Math using the hardware FIS instructions, or STD instructions.
4. Include or omit TRANSCENDENTAL FUNCTIONS (e.g. sin, cos, etc.).
5. Include or omit PRINT USING output formatting support.
6. Include or omit STRING support.
7. Include or omit GRAPHICS extensions.
8. Include or omit SMATH extensions.
9. Include or omit user written assembly language subroutines.

This software kit provides a total of seven ready-to-run variations of MUBASIC, and eleven Batch Control Files which can direct RT-11 BATCH to create other variations. The five variations on the demonstration disk (61-0002-003) include FIS math (standard option on the 8510/a), PRINT USING, and STRING support and combinations of the extensions. Those variations with Smath used the SMATH3 module (no IBM sign). The two variations on the system disk (61-0002-001) use STD math, include PRINT USING, and STRING support, and exclude any extensions. The following table summarizes all the ready-to-run MUBASIC files provided, and all the Batch Control Files provided. Other variations may be built by either following instructions in the MUBASIC System Installation Guide, or as directed below.

FILE TITLE	DISK NO.	BG/FG	OVR-LAID	MATH TYPE	TRNS FNCS	PRNT USNG	STRNG SPRT	GRAPH EXT	SMATH EXT	BATCH FILE
MUBAS.SAV	-001	BG	NO	STD	YES	YES	YES	NO	NO	BNTPN.CTL
MUPAS.REL	-001	FG	YES	STD	YES	YES	YES	NO	NO	FOTPN.CTL
MUBAS.SAV	-003	BG	NO	FIS	YES	YES	YES	YES	YES	BNTPGS.CTL
MUBAS0.SAV	-003	BG	YES	FIS	YES	YES	YES	YES	YES	BOTPGS.CTL
MUBAS1.SAV	-003	BG	NO	FIS	YES	NO	YES	YES	NO	BNTNGN.CTL
MUBAS2.SAV	-003	BG	NO	FIS	NO	YES	YES	NO	YES	BNNPNS.CTL
MUBAS3.SAV	-003	BG	NO	FIS	YES	YES	YES	NO	NO	BNTPNN.CTL
*	-003	BG	YES	FIS	YES	YES	YES	NO	NO	BOTPNN.CTL
*	-003	BG	YES	FIS	YES	NO	YES	YES	NO	BOTNGN.CTL
*	-003	BG	YES	FIS	YES	YES	YES	NO	YES	BOTPNS.CTL
*	-003	BG	YES	FIS	NO	NO	NO	NO	NO	BONNNN.CTL

The Batch Files identified in the above table contain instructions to RT-11 BATCH to generate the indicated variation of MUBASIC. Where the file titles are tagged by "*", the ready-to-run MUBAS file is not provided in the software kit, but the batch file is provided. If a variation different than one of these is required, refer to the MUBAS System Installation Guide. The Batch Control files provided may be edited using RT-11 EDIT to generate custom variations.

To create new versions using the Batch Control files, an RT-11 disk must be bootstrapped on drive QX0, and have copies of LINK.SAV and BATCH.SAV, as well as the BA.SYS handler, and a copy of the Control file. Also, certain object files must be on QX0. The requirements of each Control file are documented within each file, and printed onto the console screen whenever the file is run under Batch. After arranging the files as directed, type the following assignments and loads to the Keyboard Monitor ('.' prompt), run Batch (response is '*' prompt), and enter the Control file title, as follows:

```

ASS TT LST <return>          (substitute LP for TT, if printer is
                              available and hard copy is desired)
ASS TT LOG <return>
LOA TT,BA <return>          (add ',LP' if printing per above)
R BATCH <return>           (response is '*' prompt)
XXXXXX.CTL <return>        (several minutes of activity follow)

```

Where XXXXXX is the selected Control file for the MUBASIC variation desired. If any errors are indicated, check that all files were on the disk indicated in the Control file. Also check that sufficient room was available on the disk in drive QX0 to receive the MUBAS file (typically, 60 to 80 blocks is required).

MUBASIC CUSTOMIZATION

The following patches provide useful features within the current release of MUBASIC. To alter a ready-to-run (or user generated) MUBASIC file, a copy of RT-11 PATCH is required, and the link map of the MUBASIC, to obtain the values required.

The following patch will allow input of lower case characters from the keyboard. Note that while MUBASIC will accept only upper case programs, this will allow lower case text strings to be entered.

```

type ---      R PATCH <return>
response ---  FILE NAME
type ---      MUBAS/O <return>      (subtitute for MUBAS, if req'd)
response ---  ?NOT IN PROGR BOUNDS?
              *
type ---      400;B
response ---  *
type ---      MUBS2;0R              (substitute the numeric value of MUBS2
                                   obtained from link map for this MUBAS)
response ---  *
type ---      0,1416/
response ---  40                    (cursor left at end of response)
type ---      0 <return>
response ---  *
type ---      E <return>

```

The following patch will allow the <DELETE> key to erase characters, rather than echo the standard '_'. This makes input correction simpler. Note that there is no check on deleting and entire line, with the effect that the cursor may wrap-around to the right side of the display if the Delete key is typed too many times for a line. Also, for this patch to function correctly, the RT-11 system must be using the TK emulator (injected by TKBOOT).

```

type ---      R PATCH <return>
response ---  FILE NAME
type ---      MUBAS/O <return>      (subtitute for MUBAS, if req'd)
response ---  ?NOT IN PROGR BOUNDS?
              *
type ---      400;B
response ---  *
type ---      MUBS2;0R              (substitute the numeric value of MUBS2
                                   obtained from link map for this MUBAS)
response ---  *
type ---      0,2676/
response ---  137                    (cursor left at end of response)
type ---      10 <return>
response ---  *
type ---      E <return>

```

RESTRICTIONS

Certain restrictions must be observed in the use of this release (V1) of MUBASIC. Some are listed in the System Installation Guide. Others which must be observed are:

The RT-11/85 single disk drive handler may not be used to prompt swapping of disks while running MUBASIC. If a system is built with the single disk drive handler, and an MUBASIC program references a device other than QX0, the system will hang.

If, during a CHAIN command, the file being chained-to is not found, the program name will be changed to the Chain file name, and the old program name will be lost. If such a chain failure occurs, the programmer should rename the current program before saving it.

The contents of the MUBASIC Installation Guide do not address this specific software kit - certain sections do not apply. Specifically, all patches indicated in the guide have been applied. Also, substitute QX for DX wherever it appears in the Guide directions.

DISK DIRECTORIES

MUBAS SYSTEM DISK

Part No. 61-0002-001 01-Jul-79

CT	.NEW	5	01-Dec-75	BYE	.B00	1	01-Dec-75
EYEH	.B00	1	01-Dec-75	EXIT	.B00	1	01-Dec-75
HELLO	.B00	3	01-Dec-75	INIT	.B00	1	18-Oct-76
INITH	.B00	1	30-Oct-76	NOTICE	.B00	1	01-Dec-75
PASWRD	.B00	1	01-Dec-75	ZAP	.B00	1	01-Dec-75
1USER	.D00	2	18-Oct-76	MUBA	.OBJ	1	01-Dec-75
MUBC	.OBJ	6	01-Dec-75	MUBE	.OBJ	19	01-Dec-75
MUFENS	.OBJ	18	01-Dec-75	MUBET	.OBJ	1	01-Dec-75
MUBH	.OBJ	11	01-Dec-75	MUBHNS	.OBJ	8	01-Dec-75
MUBI	.OBJ	1	18-Oct-76	MUBM1	.OBJ	5	14-Oct-76
MUBM1	.EAE	5	01-Dec-75	MUBM1	.FIS	5	01-Dec-75
MUBM1	.FIS	3	01-Dec-75	MUBM1	.FPU	3	01-Dec-75
MUEM2	.OBJ	6	01-Dec-75	MUBM2	.EAE	6	01-Dec-75
MUBM2	.EIS	6	01-Dec-75	MUBM2	.FIS	6	01-Dec-75
MUBM2	.FPU	3	01-Dec-75	MUBNC	.OBJ	6	01-Dec-75
MUBNM2	.OBJ	1	01-Dec-75	MUBNP	.OBJ	7	01-Dec-75
MUBO	.OBJ	21	18-Feb-77	MUBPR	.OBJ	7	01-Dec-75
MUBPX	.OBJ	8	01-Dec-75	MUBPXN	.OBJ	8	01-Dec-75
MUBR	.OBJ	11	01-Dec-75	MUBRNS	.OBJ	10	01-Dec-75
MUES1	.OBJ	16	05-Sep-76	MUBS2	.OBJ	11	17-Mar-79
MUES2E	.OBJ	12	17-Mar-79	MUBT	.OBJ	3	17-Mar-79
MUEVSJ	.OBJ	1	17-Mar-79	MUBVFB	.OBJ	1	17-Mar-79
MUBX	.OBJ	21	17-Mar-79	MUBXNS	.OBJ	18	17-Mar-79
MUBXT	.OBJ	1	17-Mar-79	MUBZ	.OBJ	1	17-Mar-79
MUBI	.MAC	3	17-Mar-79	GETARG	.MAC	12	17-Mar-79
LIST	.BAS	3	17-Mar-79	CATLOG	.BAS	3	17-Mar-79
MUBAS	.SAV	62	01-Jul-79	MUBAS	.REL	68	01-Jul-79
< UNUSED >		34					

54 Files, 446 Blocks

34 Free blocks

MUBAS SYSTEM EXTENSIONS DISK

Part No. 61-0002-002 01-Jul-79

SMATH	.OBJ	5	01-Sep-77	SMATH0	.OBJ	3	01-Sep-77
SMATH1	.OBJ	3	01-Sep-77	SMATH2	.OBJ	5	01-Sep-77
SMATH3	.OBJ	5	01-Sep-77	SMATH4	.OBJ	3	01-Sep-77
SMATH5	.OBJ	3	01-Sep-77	SMATH6	.OBJ	4	01-Sep-77
SMATH	.MAC	57	01-Sep-77	LINE	.OBJ	2	16-Apr-79
CORE	.OBJ	9	16-Apr-79	CHAR	.OBJ	2	16-Apr-79
LINE	.MAC	13	17-Apr-79	CORE	.MAC	69	17-Apr-79
CHAR	.MAC	12	17-Apr-79	MUBIS	.MAC	1	17-Apr-79
MUBIG	.MAC	2	17-Apr-79	MUBIGS	.MAC	3	17-Apr-79
MUBIS	.OBJ	1	17-Apr-79	MUBIG	.OBJ	2	17-Apr-79
MUBIGS	.OBJ	2	17-Apr-79	BNTPN	.CTL	1	01-Jul-79
FOTPN	.CTL	1	01-Jul-79	BNTPGS	.CTL	2	01-Jul-79
BOTPGS	.CTL	2	01-Jul-79	BNTNGN	.CTL	2	01-Jul-79
BNNPNS	.CTL	2	01-Jul-79	BNTPNN	.CTL	1	01-Jul-79
BOTPNN	.CTL	1	01-Jul-79	BOTNGN	.CTL	2	01-Jul-79
BOTPNS	.CTL	2	01-Jul-79	BONNNN	.CTL	1	01-Jul-79
SMATH	.BAS	2	01-Sep-77	< UNUSED >		255	

33 Files, 225 Blocks

255 Free blocks

MUBAS DEMOSTRATION DISK

Part No. 61-0002-003 01-Jul-79

MONITR.SYS	46	17-Apr-79	QX .SYS	3	17-Apr-79
TT .SYS	2	17-Apr-79	LP .SYS	2	17-Apr-79
PIP .SAV	14	17-Apr-79	TKBOOT.SAV	6	17-Apr-79
CHRSET.SYS	4	17-Apr-79	INIT .B00	1	17-Apr-79
BYE .B00	1	17-Apr-79	1USER .D00	2	17-Apr-79
EX1 .BAS	2	17-Apr-79	CATLOG.BAS	3	17-Apr-79
LIST .BAS	3	17-Apr-79	EX .DAT	2	17-Apr-79
EX .BAS	3	17-Apr-79	EXAM .BAS	4	17-Apr-79
EXAM1 .BAS	2	17-Apr-79	EXAM2 .BAS	1	17-Apr-79
EXAM3 .BAS	4	17-Apr-79	EXAM4 .BAS	2	17-Apr-79
EXAM5 .BAS	1	17-Apr-79	EXAM6 .BAS	1	17-Apr-79
EXAM7 .BAS	2	17-Apr-79	EXAM8 .BAS	4	17-Apr-79
EXAMP .BAS	3	17-Apr-79	EXAMP0.BAS	2	17-Apr-79
EXAMP1.BAS	3	17-Apr-79	EXAMP2.BAS	5	17-Apr-79
EXAMP3.BAS	1	17-Apr-79	EXAMP4.BAS	1	17-Apr-79
EXAMP5.BAS	2	17-Apr-79	EXAMP6.BAS	2	17-Apr-79
EXAMP7.BAS	2	17-Apr-79	EXAMP8.BAS	2	17-Apr-79
EXAMP9.BAS	1	17-Apr-79	SMATH .BAS	2	17-Apr-79
MUBAS .SAV	70	01-Jul-79	MUBAS0.SAV	71	01-Jul-79
MUBAS1.SAV	65	01-Jul-79	MUBAS2.SAV	61	01-Jul-79
MUBAS3.SAV	60	01-Jul-79	< UNUSED >	12	

41 Files, 468 Blocks
12 Free blocks

LINK MAPS FOR ALL READY-TO-RUN VERSIONS (1-JULY-79 RELEASE)

Following are the link maps generated by each of the Control Files supplied. These are useful to verify the link of MUFAS accomplished at the software installation site, and to supply values for patches for customization or modification.

BUTPN.CTZ

PT-11 LINK LOAD MAP
MUFAS .SAV V24-04A 01-JUL-79

SECTION	ADDR	SIZE	ENTRY	ADDR	ENTRY	ADDR	ENTRY	ADDR	ENTRY	ADDR
ABS.	002030	001136	TKF1	002021	TKFE	002021	TKF3	002021	TKF3	002021
			TKF4	002021	TKF5	002021	TKF5	002021	TKF5	002021
			TKF7	002061	TKFE	002061	TKFE	002061	TKFE	002061
			KPI	002062	KPI1	002062	KPI1	002062	KPI1	002062
			KBI2	002120	KBI3	002120	KBI3	002120	KBI3	002120
			.BOL	002200	TKPR10	002240	TKPR10	002240	TKPR10	002240
			.COMMA	002256	.LPR	002270	.LPR	002270	.LPR	002270
			.SQUOT	002272	TKB15	002320	TKB15	002320	TKB15	002320
			KBI7	002340	KBI5	002350	KBI5	002350	KBI5	002350
			TKS6	176530	TKS7	176560	TKS6	176560	TKS6	176560
BASICH	001136	003342	TKS2	177320	TKS3	177530	TKS2	177530	TKS2	177530
			TKS	177560	TKS1	177560	TKS	177560	TKS	177560
			TKS4	177570	TKS	177560	TKS	177560	TKS	177560
			BASLOW	001136	USRARE	001216	USRARE	001216	USRARE	001216
			USRTEL	001224	CURUSR	001244	CURUSR	001244	CURUSR	001244
			SCRATIC	001250	CLEAR	001260	CLEAR	001260	CLEAR	001260
			IGNORE	001366	EXECUT	001372	EXECUT	001372	EXECUT	001372
			ALLOC	001540	BOMB	002012	BOMB	002012	BOMB	002012
			BOMBDD	002060	CHKCHR	002150	CHKCHR	002150	CHKCHR	002150
			DNMPACK	002256	TKLSA	002242	TKLSA	002242	TKLSA	002242
MUS21	001136	003342	TKL5RN	002452	TSL5LM	002456	TSL5LM	002456	TSL5LM	002456
			TKL5EN	002526	TKR5YN	002530	TKR5YN	002530	TKR5YN	002530
			TKL5EN	002564	FNDSTL	002640	FNDSTL	002640	FNDSTL	002640
			FNDSTX	002674	TKPRSAV	002740	TKPRSAV	002740	TKPRSAV	002740
			FNDSTX	002766	TKPRTAB	003020	TKPRTAB	003020	TKPRTAB	003020
			BLNGE	003036	LNGE	003042	LNGE	003042	LNGE	003042
			MPYEN	003326	MSGERR	003356	MSGERR	003356	MSGERR	003356
			MSGODE	003424	.XORM	003454	.XORM	003454	.XORM	003454
			INTEVA	003666	REVAL	003672	REVAL	003672	REVAL	003672
			SAVREC	003732	SKIPEO	003774	SKIPEO	003774	SKIPEO	003774
OVERLAY	001136	003342	ERRNOB	004066	ERRNOB	004072	ERRNOB	004072	ERRNOB	004072
			DE.LET	004500	RE.NAM	004500	RE.NAM	004500	RE.NAM	004500
			ERRFNE	004574	RE.LES	004630	RE.LES	004630	RE.LES	004630
			ORFN.	004710	CLOSCH	006324	CLOSCH	006324	CLOSCH	006324
			CLOSC7	006546	CLOSC7	006552	CLOSC7	006552	CLOSC7	006552
			DNKTUS	006650	NXTUSR	006656	NXTUSR	006656	NXTUSR	006656
			CUTADJ	007526	CUTADL	007530	CUTADL	007530	CUTADL	007530
			ERR410	0102164	SYSEXI	210220	SYSEXI	210220	SYSEXI	210220
			ERR410	010436	PURGAL	010514	PURGAL	010514	PURGAL	010514
			RRB	010660	WBL	010716	WBL	010726	WBL	010726
BASIXC	001136	003342	REP	010730	CONSAV	011034	CONSAV	011034	CONSAV	011034
			GALFB	011152	LINK	011260	LINK	011260	LINK	011260
			MERGE	011440	GSB	011752	GSB	011752	GSB	011752
			GSC	012114	CVLUN	012210	CVLUN	012210	CVLUN	012210
			CFKPC	012330	BLOCK	012346	BLOCK	012346	BLOCK	012346
			VFEK1	012664	FGNDFG	013114	FGNDFG	013114	FGNDFG	013114
			IORQ	013122	CUT	013124	CUT	013126	CUT	013126
			LSCHAN	013130	LUCHAN	013132	LUCHAN	013134	LUCHAN	013134
			MNCFND	013136	CSWT	013140	CSWT	013144	CSWT	013144
			SYSTEM	013146	HEAPLH	013454	HEAPLH	013462	HEAPLH	013462
MUS22	013464	003134	IREADY	013464	RCTRLO	013470	RCTRLO	013474	RCTRLO	013474
			SRSET	013474	SETCOL	013476	SETCOL	013514	SETCOL	013514
			ISTART	013514	GETLIBY	013556	GETLIBY	013644	GETLIBY	013644
			CNCSTO	014026	FUTBYT	014042	FUTBYT	014134	FUTBYT	014134
			PUTC.R	014304	DATEST	014334	DATEST	014541	DATEST	014541
			CHKISE	014622	CHKOSE	014630	CHKOSE	014736	CHKOSE	014736
			ERRLCN	014770	ERRCN0	014776	ERRCN0	015010	ERRCN0	015010
			TPINT	015662	FUNGT	015662	FUNGT	015636	FUNGT	015636
			KEYSAV	015662	DAT	016612	DAT	016616	DAT	016616
			SYASUN	016616	SYASUN	016616	SYASUN	016616	SYASUN	016616

MUET	016620	000570	016620	017164	MRKTIM	017164	CMRKT	017200	
BASIC1	017410	000006	017410	017356	MRKINI	017356			
BASICC	017416	000004	017416	017414	FEGI	017414			
EASPR	017422	001020	017422	017416	CALLIM	017416	CALRET	017416	
				NUMOUT	017742	NUMSGN	017754		
				NUMSTT	020070	SAVCHA	020310	SAVCHI	020312
				EXPY1	020330				
				\$BI	020442				
				\$R	020554				
				\$ROR.	020640	IFPMP	020776	\$ERRFC	021000
				\$DR	021002	\$ADR	021006	ADD\$	021022
				\$DR	021456				
				\$MLR	021760				
				\$INTR	022276	\$POPR3	022376	\$POLSH	022404
				\$A10G10	022410	ALOG	022414		
				ATAN	022770				
				EXP	023454	SIN	024060		
				COS	024024				
				SQR1	024400				
				ERRCE	024602	REVLRE	025556	CLOSTS	025606
				STOP	025652	REYRJ	025672	EDIT	027104
				EDTLL	027274	EDINT	027304	RONFIL	031536
				CHNSCR	032030	CLRVAR	032124	INITSC	032366
				ERRFPV	035474	ASIGN	037134	DIASS	037210
				IDFO	037330	UDFC	037402	EYE	037532
				SETTY	037616	TAPE	037706	KEY	037716
				OPNFIL	037726	OPNF1C	040472		
				SIGMENT	000001				
				EXECC	041160	RRRET	041674	ASSIGN	041714
				PRIJMP	044606	PRINCR	044636	ERRARG	046046
				EVAL	046054	ERRPDL	046420	OPRATO	047502
				SOPRAT	047302	ERRNIX	047412	STPRO	047502
				INTFN	047726	ERRUFN	050716	PIFN	051350
				DATFN	051336	VFFN	051362	FNDSTV	052114
				FNDSTR	051714	GETVAR	051742	INT	052114
				PUSH	052376	POP	052410	PUSH1	052422
				ERRSOP	052620	MAKEST	052642	STOVAR	052776
				STOSVA	053056	SVAL	053234		
				PRU	053616				
				SEGMENT	000002				
				ONCFON	052172				
				SEGMENT	000003				
				OFOVLI	060346				
				TRANSFER ADDRESS =	001220				
				HIGE LIMIT =	060570				

FOTRPN.CTL

I-11 LINK LOAD MAP
01-JUL-79

SECTION ADDR SIZE ENTRY ADDR
A.S. 220000 001064
TRF1 000001
TRF2 000001
TRF3 000001
TRF4 000001
TRF5 000001
TRF6 000001
TRF7 000001
TRF8 000001
TRF9 000001
TRF0 000001

TRF1 000001
TRF2 000001
TRF3 000001
TRF4 000001
TRF5 000001
TRF6 000001
TRF7 000001
TRF8 000001
TRF9 000001
TRF0 000001

TRF1 000001
TRF2 000001
TRF3 000001
TRF4 000001
TRF5 000001
TRF6 000001
TRF7 000001
TRF8 000001
TRF9 000001
TRF0 000001

TRF1 000001
TRF2 000001
TRF3 000001
TRF4 000001
TRF5 000001
TRF6 000001
TRF7 000001
TRF8 000001
TRF9 000001
TRF0 000001

TRF1 000001
TRF2 000001
TRF3 000001
TRF4 000001
TRF5 000001
TRF6 000001
TRF7 000001
TRF8 000001
TRF9 000001
TRF0 000001

TRF1 000001
TRF2 000001
TRF3 000001
TRF4 000001
TRF5 000001
TRF6 000001
TRF7 000001
TRF8 000001
TRF9 000001
TRF0 000001

MUST 016546 000570
BASIC1 017336 000006
BASIC2 017344 000004
BASPR 017350 001020
KWINT 016546 000570
SETMR 017224
FTAB1 017336
CALL 017344
ASCAN 017350
NUMST 020016
EXPI 020256
SRI 020370
YR 020502
ERRR 020566
ERRR 020734
ADR 021404
ADR 021806
ADR 022224
ADR 022336
ALOG 022716
ATAN 023402
EXP 023402
COS 024352
SORT 024352

OVERLAY REGION 000001
EASICE 024530 010372
MUSE2E 035122 0003762
OVERLAY REGION 000001
BASICX 024530 012434
EASFX 037164 001710
OVERLAY REGION 000001
MUBO 024530 012460
OVERLAY REGION 000002
BASIC 041100 002624
FNFAE 043732 000222

TRANSFER ADDRESS = 001146
HIGH LIMIT = 044152

MRKTIM 017112 CMRET 017125
MREINI 017304
PIGI 017342
CALLIM 017344 CALRET 017344
NUMOUT 017670 NUMSON 017702
SAVCHA 020236 SAVCHI 020240

REVLRE 025506 CLOSTS 025536
PESITJ 025622 EDIT 027034
EDTINT 027234 RUNFIL 031466
CLRVAR 032054 INITSC 032316
FILSPF 035352 FILSP2 035416
ASIGN 037064 DRASS 037140
UDFC 037332 BYE 037462
TAPF 037636 KEY 037646
OPNF10 040422
REPRT 05246 ASSIGN 025266
PRINCR 030210 ERNARG 031420
ERRPDI 031772 PRATO 032164
ERRMI 032764 STPRO 033134
ERRUFN 034270 PIRN 034672
VFVN 034734 FNDSTV 035262
GETVAR 035314 INT 035466
POP 035750 PUSE1 035774
MAKEST 036214 STOVAR 036350
SVAL 036606

BOY PGS. CTL

RT-11 LINK
MUSAS .SAV

LOAD MAP
01-JUL-79

724-244

SECTION ADDR	SIZE	ENTRY ADDR	ENTRY ADDR	ENTRY ADDR	ENTRY ADDR	ENTRY ADDR	ENTRY ADDR	ENTRY ADDR	ENTRY ADDR
ABS. 000002	001564	TK21	002021	TK22	002021	TK23	002021	TK24	002021
		TK25	002021	TK26	002021	TK27	002021	TK28	002021
		TK29	002021	TK30	002021	TK31	002021	TK32	002021
		TK33	002021	TK34	002021	TK35	002021	TK36	002021
		TK37	002021	TK38	002021	TK39	002021	TK40	002021
		TK41	002021	TK42	002021	TK43	002021	TK44	002021
		TK45	002021	TK46	002021	TK47	002021	TK48	002021
		TK49	002021	TK50	002021	TK51	002021	TK52	002021
		TK53	002021	TK54	002021	TK55	002021	TK56	002021
		TK57	002021	TK58	002021	TK59	002021	TK60	002021
		TK61	002021	TK62	002021	TK63	002021	TK64	002021
		TK65	002021	TK66	002021	TK67	002021	TK68	002021
		TK69	002021	TK70	002021	TK71	002021	TK72	002021
		TK73	002021	TK74	002021	TK75	002021	TK76	002021
		TK77	002021	TK78	002021	TK79	002021	TK80	002021
		TK81	002021	TK82	002021	TK83	002021	TK84	002021
		TK85	002021	TK86	002021	TK87	002021	TK88	002021
		TK89	002021	TK90	002021	TK91	002021	TK92	002021
		TK93	002021	TK94	002021	TK95	002021	TK96	002021
		TK97	002021	TK98	002021	TK99	002021	TK100	002021

SECTION ADDR	SIZE	ENTRY ADDR	ENTRY ADDR	ENTRY ADDR	ENTRY ADDR	ENTRY ADDR	ENTRY ADDR	ENTRY ADDR	ENTRY ADDR
ABS. 000002	001564	TK21	002021	TK22	002021	TK23	002021	TK24	002021
		TK25	002021	TK26	002021	TK27	002021	TK28	002021
		TK29	002021	TK30	002021	TK31	002021	TK32	002021
		TK33	002021	TK34	002021	TK35	002021	TK36	002021
		TK37	002021	TK38	002021	TK39	002021	TK40	002021
		TK41	002021	TK42	002021	TK43	002021	TK44	002021
		TK45	002021	TK46	002021	TK47	002021	TK48	002021
		TK49	002021	TK50	002021	TK51	002021	TK52	002021
		TK53	002021	TK54	002021	TK55	002021	TK56	002021
		TK57	002021	TK58	002021	TK59	002021	TK60	002021
		TK61	002021	TK62	002021	TK63	002021	TK64	002021
		TK65	002021	TK66	002021	TK67	002021	TK68	002021
		TK69	002021	TK70	002021	TK71	002021	TK72	002021
		TK73	002021	TK74	002021	TK75	002021	TK76	002021
		TK77	002021	TK78	002021	TK79	002021	TK80	002021
		TK81	002021	TK82	002021	TK83	002021	TK84	002021
		TK85	002021	TK86	002021	TK87	002021	TK88	002021
		TK89	002021	TK90	002021	TK91	002021	TK92	002021
		TK93	002021	TK94	002021	TK95	002021	TK96	002021
		TK97	002021	TK98	002021	TK99	002021	TK100	002021

TRANSFER ADDRESS = 010506 HI LIMIT = 055199

BMMPPNS.CTZ

04-84A LINK LOAD MAP
01-JUL-79

SECTION	ADDR	SIZE	ENTRY	ADDR	ENTRY	ADDR	ENTRY	ADDR	ENTRY	ADDR
ABS.	000000	001136	TKF1	002201	TKF2	002001	TKF3	000001	TKF4	000001
			TKF2	000001	TKF5	000001	TKF6	000001	TKF7	000001
			TKF3	000001	RNDPND	000014	TKF8	000014	TKF9	000014
			TKF4	000060	TKF1	000100	TKF10	000100	TKF11	000100
			TKF5	000120	TKF2	000130	TKF12	000130	TKF13	000130
			TKF6	000200	TKF3	000240	TKF14	000240	TKF15	000240
			TKF7	000256	TKF4	000270	TKF16	000270	TKF17	000270
			TKF8	000320	TKF5	000330	TKF18	000330	TKF19	000330
			TKF9	000340	TKF6	000350	TKF20	000350	TKF21	000350
			TKF10	176530	TKF7	176560	TKF22	176560	TKF23	176560
			TKF11	177520	TKF8	177530	TKF24	177530	TKF25	177530
			TKF12	177560	TKF9	177560	TKF26	177560	TKF27	177560
			TKF13	177570	TKF10	177570	TKF28	177570	TKF29	177570
			TKF14	177580	TKF11	177580	TKF30	177580	TKF31	177580
	SMATH	001136	002476	MUL1136	001136	DIV1136	001144	ADR1136	001152	
			ADD1136	001166	SUB1136	001166				
			FTAB1	003634	BKGI	003676				
			BAS10W	003700	USBARE	003760				
			USRTBL	003766	CURUSR	004006				
			SCRATC	004012	CLEAR	004022				
			IGNORB	004130	EXECUT	004134				
			ALLOE	004302	FOMB	004554				
			BOMBD	004622	CHKCHR	004720				
			DNPACK	005020	TBL5LM	005204				
			TBL5RN	005214	TBL5LN	005220				
			TBL5EN	005270	FRRSYN	005272				
			FINDEX	005436	FPPRS	005454				
			FREQE	005530	GTPTAB	005562				
			EINGE	005600	LINGET	005604				
		MYTEN	006070	MSGERR	006120					
		MSGODE	006166	NORM	006216					
		INTEVA	006430	REVAL	006434					
		SAVREC	006472	SKIPRO	006556					
		VAL	006630	ERRNOB	007234					
		DE.LET	007242	RE.NAM	007242					
		ERRFNF	007336	RE.LES	007372					
		OPEN.	007452	CLOSCH	011066					
		CLOC7	011310	CLOS7B	011324					
		CUTADJ	011412	NXTUSR	011420					
		ERR410	012270	CUTADL	012272					
		SFRSET	013200	SSEX1	012742					
		RB	013422	WBL	013460					
		GALFB	013714	LINK	013714					
		MRGCS	014202	G5B	014514					
		GSC	014656	CVLUN	014752					
		CFKBC	015072	FLOCK	015110					
		VFBK1	015426	IGNDFG	015556					
		IORQ	015664	CUT	015666					
		LSCHAN	015672	LUCHAN	015674					
		INCFNU	015700	CSVT	015700					
		SYSLUN	015710	REAPLH	016216					
		TREADY	016226	RCRLO	016236					
		SRESET	016236	SETCOL	016240					
		CNCSTO	016570	PUTEYB	016604					
		FUTC.R	017046	LATCOM	017076					
		CHK15E	017364	CEKCOE	017372					
		ERR1CN	017532	ZRRCON	017540					
MUPSI	007242	006764								
	MUPB2	016226	003134							

BNTPRM.CTL

RT-11 LINK MURAS .SAV
 V04-04A
 LOAD MAP 01-JUL-79

SECTION ADDR	SIZE	ENTRY ADDR	ENTRY	ADDR	ENTRY	ADDR	ENTRY	ADDR
.AFS.	000000	001136	TKF1	000001	TKF2	000001	TKF3	000001
			TKF4	000001	TKF5	000001	TKF6	000001
			TKF7	000001	TKF8	000001	TKF9	000001
			KBI	000001	KBI1	000001	KBI2	000001
			KBI2	000001	KBI3	000001	KBI4	000001
			.EOL	000001	.EOL	000001	.EOL	000001
			.COMMA	000001	.COMMA	000001	.COMMA	000001
			.SQDOT	000001	.SQDOT	000001	.SQDOT	000001
			KBI7	000001	KBI8	000001	KBI9	000001
			TKS6	175532	TKS7	175560	TKS8	175570
			TKS2	177520	TKS3	177530	TKS4	177546
			TKS	177560	TKS1	177560	TKS	177560
			TKS4	177570	TKS1	177560	TKS	177560
BASICR	001136	003342	BAS10V	001216	GO	001220	GO	001220
			USR1BL	001244	LSTUSR	001246	LSTUSR	001246
			SCRATC	001250	READY	001266	READY	001266
			IGNORE	001366	ERRGO	001372	ERRGO	001372
			ALIOC	001542	FORMDO	002044	FORMDO	002044
			BOMBED	002060	CHKCHR	002156	DIVTEN	002220
			DNPACB	002258	HEL5A	002442	TABLES	002444
			TELSRN	002452	ERLSM	002456	FLNSHM	002472
			TELSRN	002520	ERLSM	002520	FLNSHM	002536
			FLINEN	002564	INDSL	002640	CHFIL	002672
			FNDETX	002674	PPRES	002712	PPSAV	002740
			PREEX	002766	GTTRAB	003020	XLINGE	003030
			FLINEN	003036	LINGET	003042	LITEVA	003172
			MPYTRM	003326	MSGERR	003356	MSG	003364
			MSGODE	003424	NORM	003454	ODVTT	003646
			INTEVA	003666	REVAL	003672	EVLR	003716
			SAVRES	003730	SKIPEO	003774	ERRTRN	004060
			VAL	004066	ERRM05	004472	ERRMNA	004554
			DE.LPT	004500	RE.NAM	004520	CLOSE.	004706
			ERRNF	004574	RE.LES	004630	CLOSE.	004706
			OPEN.	004714	CLOSCH	006324	CLOSCH	006542
			CLOSCH	006546	CLOS7B	006562	CLOSCH	006600
			DMYTUS	006650	XITUSR	006656	NTFS	007504
			CUTAJJ	007566	CUTIDL	007530	GRN	007546
			ERR410	010164	SYSEI	010200	DIMBL	010272
			SFRSET	010436	PURCAL	010514	CLOSAL	010516
			RNB	010660	JBL	010716	WB	010726
			RE	010752	CONSAV	011034	GSFES	011122
			CALFB	011152	LINK	011260	DEQSC	011314
			MERGE	011449	GSB	011752	PCFP	012072
			CSC	012114	CVLWN	012210	MLUTPC	012210
			CFEBC	012330	FLOCK	012346	WAIT	012626
			VPELX1	012684	FCNDTC	013114	DNEFO	013120
			IQRC	013122	CUT	013124	CUTUC	013126
			LSCHAN	013132	LUCHAN	013132	MBFN0	013134
			MNCPTU	013146	CSWT	013140	LOCKFC	013144
			SYSLUN	013146	HEAPTR	013454	HEAPST	013462
			IREADY	013464	RCTRLO	013470	RANDOM	013474
			SRESET	013474	SETCOL	013476	BUTCLR	013514
			ISTART	013514	GETLBY	013556	GETCHA	013644
			CNCSTO	014026	PURBYT	014042	PURCHA	014134
			PUTCAR	014304	DATCOM	014334	DAREST	014541
			CHKISE	014622	CHKOSE	014630	ERRIID	014736
			ERICN	014770	ERRCNO	014776	KEINT	015010
			TPINT	015662	HUNGTT	016506	TTYCRT	016536
			KDVSAT	016602	DAT	016612	STASCN	016614
			SYASUN	016616	SYASUN	016616	SYASUN	016616

MUBT	016620	000570	KVINT	016620	000570	SETMR	017276	MRTIM	017164	CHRT	017200
BASICC	017410	000004	FRABI	017410	000004	FRABI	017276	MRTIM	017164	CHRT	017200
BASPR	017422	001020	ASCCN	017422	001020	ASCCN	017410	MRTIM	017164	CHRT	017200
			NUMST	020070	000330	NUMST	017416	MRTIM	017164	CHRT	017200
			EXPF1	020442	000120	EXPF1	017416	MRTIM	017164	CHRT	017200
			\$R	020442	000120	\$R	017416	MRTIM	017164	CHRT	017200
			\$ROR.	020646	000004	\$ROR.	017416	MRTIM	017164	CHRT	017200
			\$ADR	021124	000014	\$ADR	017416	MRTIM	017164	CHRT	017200
			\$NLR	021144	000004	\$NLR	017416	MRTIM	017164	CHRT	017200
			\$NTR	021152	000076	\$NTR	017416	MRTIM	017164	CHRT	017200
			\$ALOG1	021246	000360	\$ALOG1	017416	MRTIM	017164	CHRT	017200
			\$ATAN	021626	000464	\$ATAN	017416	MRTIM	017164	CHRT	017200
			EXP	022312	000350	EXP	017416	MRTIM	017164	CHRT	017200
			COS	022662	000354	COS	017416	MRTIM	017164	CHRT	017200
			SURT	023236	000142	SURT	017416	MRTIM	017164	CHRT	017200
			EXECE	023402	010372	EXECE	017416	MRTIM	017164	CHRT	017200
			STOP	024452	000004	STOP	017416	MRTIM	017164	CHRT	017200
			EDITN	026074	000004	EDITN	017416	MRTIM	017164	CHRT	017200
			CHNSCR	030636	000004	CHNSCR	017416	MRTIM	017164	CHRT	017200
			HEADR	032772	000004	HEADR	017416	MRTIM	017164	CHRT	017200
			INFO	035274	000004	INFO	017416	MRTIM	017164	CHRT	017200
			ERRFPV	036132	000004	ERRFPV	017416	MRTIM	017164	CHRT	017200
			SETTY	036416	000004	SETTY	017416	MRTIM	017164	CHRT	017200
			OPNFIL	036526	000004	OPNFIL	017416	MRTIM	017164	CHRT	017200
			SEGMENT	000001	000001	SEGMENT	017416	MRTIM	017164	CHRT	017200
			EXECI	037760	000001	EXECI	017416	MRTIM	017164	CHRT	017200
			PRJMP	043406	000001	PRJMP	017416	MRTIM	017164	CHRT	017200
			EVAL	044654	000001	EVAL	017416	MRTIM	017164	CHRT	017200
			SOPRAT	046102	000001	SOPRAT	017416	MRTIM	017164	CHRT	017200
			INTFN	046526	000001	INTFN	017416	MRTIM	017164	CHRT	017200
			DATFN	050136	000001	DATFN	017416	MRTIM	017164	CHRT	017200
			PNDSTR	050514	000001	PNDSTR	017416	MRTIM	017164	CHRT	017200
			PUSH	051176	000001	PUSH	017416	MRTIM	017164	CHRT	017200
			ERRSOE	051420	000001	ERRSOE	017416	MRTIM	017164	CHRT	017200
			STOSVA	051656	000001	STOSVA	017416	MRTIM	017164	CHRT	017200
			PRU	052416	000001	PRU	017416	MRTIM	017164	CHRT	017200
			SEGMENT	000001	000001	SEGMENT	017416	MRTIM	017164	CHRT	017200
			ONCEON	050772	000001	ONCEON	017416	MRTIM	017164	CHRT	017200
			SEGMENT	000001	000001	SEGMENT	017416	MRTIM	017164	CHRT	017200
			OFOVLY	057146	000001	OFOVLY	017416	MRTIM	017164	CHRT	017200
			TRANSFER ADDRESS =	001220		TRANSFER ADDRESS =	001220				
			HIGH LIMIT =	057370		HIGH LIMIT =	057370				

MUBT

CHRT

017200