TEXAS INSTRUMENTS

Improving Man's Effectiveness Through Electronics

Model 990 Computer
AMPL Software Documentation
Package Release 2.0

937872-0003

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Digital Systems Division

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APPLICATION		REVISIONS			
NEXT ASSY	USED ON	LTR	DESCRIPTION	DATE	APPROVED
	7506	A	ECN#1601-C-Added 911 VDT & 6-slot chassis to package.	11/15/77 LRA	LRA 11-9-77

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INTRODUCTION

THIS MANUAL CONTAINS INFORMATION RELATING TO THE DOCUMENTATION SUPPLIED WITH THE AMPL SOFTWARE PACKAGE. THE PART NUMBER FOR EACH COMPONENT IS LISTED AND THESE NUMBERS SHOULD BE USED WHEN MAKING INQUIRIES TO TEXAS INSTRUMENTS ABOUT THESE MATERIALS. THE SOFTWARE SUPPLIED CONTAINS THREE DISKETTES WHICH SUPPORT TWO DISTINCT OPERATING ENVIRONMENTS. ONE DISKETTE SUPPORTS THE USER WITH ONLY 16K WORDS OF MEMORY AND SOFTWARE DEVELOPMENT IS NOT SUPPORTED UNDER THIS SYSTEM. THIS IS THE 733 ASR SYSTEM AND IT IS INTENDED FOR USE BY THE CUSTOMER WHO ALREADY OWNS A TEXAS INSTRUMENTS PROTOTYPING SYSTEM (ASSUMED TO HAVE A SIX (6) SLOT CHASSIS) AND WISHES TO UPGRADE TO THE AMPL FUNCTIONS. THE OTHER TWO SYSTEMS (THE AMPL 913 SYSTEM AND THE AMPL 911 SYSTEM) REQUIRE 24K WORDS TO OPERATE AND DO SUPPORT SOFTWARE DEVELOPMENT AS WELL AS AMPL FUNCTIONS. AN OPERATING GUIDE FOR EACH ENVIRONMENT IS SUPPLIED AND THE USER SHOULD CHOOSE THE APPROPRIATE MANUAL AND DISKETTE FOR HIS PARTICULAR REQUIREMENTS. THE SYSTEM OPERATION GUIDE SUPPLIED FOR THE 913/911 SYSTEMS IS DOCUMENTED ASSUMING A 913 AS THE SYSTEM CONSOLE BUT THIS SHOULD NOT CAUSE ANY PROBLEMS IF THE USER KEEPS TWO THINGS IN MIND WHEN USING A 911 TERMINAL (1) ANY REFERENCE TO THE "HELP" KEY IN THE OPERATION GUIDE SHOULD BE THOUGHT OF AS REFERRING TO THE COMMAND ("CMD") KEY ON THE 911 AND (2) THE "UPPER CASE LOCK" KEY ON THE 911 SHOULD ALWAYS BE LOCKED IN THE DOWN POSITION WHEN USING THE AMPL SOFTWARE. ALL OTHER DOCUMENTATION SHOULD BE INDEPENDENT OF THE TYPE OF TERMINAL BEING USED AS THE OPERATOR'S CONSOLE.

THE LIST OF MATERIALS IS AS FOLLOWS:

1. THIS DOCUMENT

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2. MODEL 990 COMPUTER AMPL MICROPROCESSOR PROTOTYPING LABORATORY SYSTEM OPERATION GUIDE (USED WITH THE AMPL 913 AND 911 SYSTEMS. SEE 6A, 6B)
PART NUMBER 946244-9701

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3. MODEL 990 COMPUTER AMPL MICROPROCESSOR PROTOTYPING LABORATORY SYSTEM OPERATION GUIDE (PROTOTYPING SYSTEM UPGRADE VERSION)
PART NUMBER 949620-9701

THIS MANUAL IS TO BE USED IN CONJUNCTION WITH THE 733 AMPL SYSTEM (SEE 6C)

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4. MODEL 990 COMPUTER AMPL SYSTEM TUTORIAL (USED WITH THE AMPL 913/911 SYSTEMS. SEE 6A, 6B)
PART NUMBER 949621-9701

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5. AMPL REFERENCE CARD (USED WITH THE AMPL 913 SYSTEM. SEE 6A)
PART NUMBER 946265-9701

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6. 3 DISKETTES

A. 913 VDT SYSTEM DISKETTE
PART NUMBER 939801-9901
THIS DISKETTE CONTAINS AN OPERATING SYSTEM WHICH SUPPORTS THE AMPL HARDWARE, A 913 VDT CONSOLE AS THE LOG AND A LINE PRINTER. ALSO ON THIS DISKETTE ARE ALL THE PRE-DEFINED AMPL PROCEDURES

B. 911 VDT SYSTEM DISKETTE
PART NUMBER 939801-9903
SAME AS 6A EXCEPT THAT THE 911 IS SUPPORTED AS THE SYSTEM CONSOLE

C. 733 ASR SYSTEM DISKETTE
PART NUMBER 939801-9902
THIS DISKETTE CONTAINS AN AMPL SYSTEM WHICH ONLY SUPPORTS A 733 ASR AS THE SYSTEM CONSOLE AND ONLY SUPPORTS AMPL FUNCTIONS. THIS DISKETTE IS INTENDED AS AN UPDATE FOR THE USER WHO ALREADY OWNS A PROTOTYPING SYSTEM AND WISHES TO UPGRADE TO AMPL FUNCTIONS. IT IS NOT POSSIBLE FOR THE USER TO RECREATE THIS SYSTEM HIMSELF AND A STANDARD HARDWARE CONFIGURATION FOR EACH OF THE SIX SLOTS IS ASSUMED AS FOLLOWS:

SLOT 1	THE 990/4 CPU BOARD
SLOT 2	A 12K(WORDS) MEMORY BOARD
SLOT 3	A 9900/9980 EMULATOR BOARD WIRED TO INTERRUPT LEVEL THREE (3)
SLOT 4	A FLOPPY DISC CONTROLLER WIRED TO INTERRUPT LEVEL SEVEN(7)
SLOT 5	AN AMPL LOGIC STATE TRACE RECORDER BOARD WIRED TO INTERRUPT LEVEL FOUR (4)
SLOT 6R	A 733 ASR HALF SIZE CONTROLLER CARD WIRED TO INTERRUPT LEVEL SIX (6)

THIS DISKETTE ALSO CONTAINS A SET OF AMPL PROCEDURES WHICH ESSENTIALLY ARE A SUBSET OF THE PROCS MENTIONED IN STEP 6A.

A LIST OF THE KNOWN AMPL SYSTEM PROBLEMS MAY ALSO BE FOUND IN THIS MANUAL. BE SURE AND READ THIS LIST BEFORE ATTEMPTING TO EXECUTE THE AMPL SOFTWARE.

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APPLICATION		REVISIONS			
NEXT ASSY	USED ON	LTR	DESCRIPTION	DATE	APPROVED
	7506				

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PD, LIST OF MATERIALS FORMAT AND ABBREVIATIONS

The documentation for software packages contains information describing the packaging and use of the software. A key document is the top-level List of Materials (LM) which lists all media and documentation included in the software package. This top-level LM often lists a group of items which is detailed on a separate LM. The collection of LMs, with the top-level first, is always at or near the front of the documentation package, and contains the following information:

1. The part number and revision level of the software package (shown on the top-level LM). It is necessary to have this information available whenever contacting Texas Instruments about the software.
2. The materials that make up the software package.

   Items such as cards, cassettes, discs, and manuals are shipped with the package. Paper documents such as program descriptions, listings, and load maps appear in the documentation, in the order listed, following the collection of Lists of Materials. The documentation is distributed as either a collection of documents in a packet or as a bound volume.

   It is important to refer to certain parts of the documentation before using the software. The Installation Procedure, for example, contains directions to properly install the software package on a 990 computer system. The Problem Notification contains a list of known problems and patches which should be read and installed as required before the software is used.

LM DESCRIPTION ABBREVIATIONS

Almost any item can be called out for shipment on an LM, and a set of abbreviations is used for the most frequently listed items. One group of items consists of various paper documents, all of which are contained in the documentation:

SP - Software Package
This is a group of items, and another LM with the specified part number will be found following the top-level LM. All items on this second LM are part of the top-level software package.

PD - Program Description
This document contains descriptive information for the software package. It may be, among other things, an Installation Procedure, Problem Notification, Disc Catalog, or Verification Procedure.

SL - Source Listing
A listing of the referenced item.

LML- Load Map Listing
A load map for the referenced linked module. A List of Materials may be attached to show the part numbers of the individual modules that are used in the link edit.

AL - Assembly Listing
An assembly listing for the referenced item.

The second group of items consists of various media on which software is distributed. The abbreviations are:

CDSO - Card Deck Source/Object
A card deck with both source and object records. It is usually, but not always, a job control stream mixed with object records.

CDS - Card Deck Source
A card deck containing only source statements. This deck could contain job control statements or consist entirely of job control statements.

CDO - Card Deck Object
An object deck as output from a compiler, assembler, or linkage editor. No job control records are included.

CDFL - Card Deck Fully Linked
A fully linked object module as output by a linkage editor. No job control records are included.

CCSO - Cassette Cartridge Source/Object

CCS - Cassette Cartridge Source/[illegible]

CCO - Cassette Cartridge Object

CCFL - Cassette Cartridge Fully Linked

The preceeding four items have the same meaning as their card deck counterparts, except that they represent cassettes for the 733 ASR terminal.

Most cassettes contain more than one part-numbered file. In this case the top-level LM calls out the cassette as a software package. The part number of the software package is also

the part number of the cassette, and its contents are listed on the LM with the corresponding part number.

Diskettes are always listed as a software package, with the contents listed on the corresponding LM.

DCO - Disc Cartridge Object
A disc cartridge containing a software package in object form. The disc may contain job control records. It is usually a fully-built system disc.

DCS - Disc Cartridge Source
A disc cartridge containing a software package in source form.

REFERENCED ITEMS

Some items listed on a LM have the word "REF", for reference, listed as the quantity. In this case, the line item is used in the manufacturing process but not shipped as part of the software package. For example, an LM for the contents of a cassette or diskette lists card decks as reference items. These card decks are not actually shipped, but are copied to the cassette or diskette as part of the manufacturing process.

A group of media-independent abbreviations can be used to specify the copying of software to a media during the manufacturing process. These abbreviations are always listed as "REF" items. A SRC punched on cards is equivalent to a CDS, a group of SRC and OBJ items copied to cassette is the same as a CDSO, and so forth. The abbreviations are:

SRC - Source
OBJ - Object
LIST- Listing
FLO - Fully Linked Object

TEXAS INSTRUMENTS INCORPORATED

DATE 06/16/76

LIST OF MATERIAL

PART NUMBER LM 999999-0001 REV C

PRINT ITEM NUMBER	QUANTITY PER ASSEMBLY	UNIT OF ISSUE	DWG. SIZE	PART NUMBER	DESCRIPTION	VENDOR PART NUMBER
0001	00001.000	EA		666666-9901	PD,FORTRAN INSTALLATION PROCEDURE-SYS990	*Installation procedure*
0002	00001.000	EA		888888-9701	MANUAL,FORTRAN PROGRAMMERS GUIDE-990	*Programmer's Guide*
0003	00001.000	EA		333333-9902	SL,FORTRAN COMPILER & OVERLAYS-FTN990	
0004	00001.000	EA		555555-9902	SL, AMAT,ADD MEMBER ALIAS TASK-FTN990	
0005	00001.000	EA		222222-9901	SL,FORTRAN RUN-TIME,PART 1 OF 3-SYS990	*Listings of information copied to cassettes*
0006	00001.000	EA		222222-9902	SL,FORTRAN RUN-TIME,PART 2 OF 3-SYS990	
0007	00001.000	EA		222222-9903	SL,FORTRAN RUN-TIME, PART 3 OF 3-SYS990	
0008	00001.000	EA		444444-0021	SP,FORTRAN PKG,CASSETTE 1 OF 2-SYS990	
0008A					REF LIST OF MATERIALS FOR	*Cassettes shipped with system. Contents listed on separate LMs.*
0008B					CONTENTS OF 444444-0021	
0009	00001.000	EA		444444-0022	SP,FORTRAN PKG,CASSETTE 2 OF 2 SYS990	
0009A					REF LIST OF MATERIALS FOR	
0009B					CONTENTS OF 444444-0022	
0010	00001.000	EA		777777-9902	PD,FORTRAN PROBLEM NOTIF,REL 2.0-SYS990	*Problem Notification*

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EXAMPLE TOP-LEVEL LM FOR FORTRAN PACKAGE

Complete Software Package part number & revision level.

(price list part no.)

FTSMAN	DATE	CKD DRAFTSMAN	DATE	DESIGN ENGINEER	DATE	TITLE SP,FORTRAN IV PACKAGE(CCO)-SYS990	
D MFG	DATE	APPD. PROJECT ENGINEER	DATE	RELEASED	DATE	PROJECT NO	PART NUMBER LM 999999-0001 REV C

TEXAS INSTRUMENTS INCORPORATED

DATE 06/16/76

LIST OF MATERIAL

LM NUMBER 444444-0021 REV C

PRINT ITEM NUMBER	QUANTITY PER ASSEMBLY	UNIT OF ISSUE	DWG. SIZE	PART NUMBER	DESCRIPTION	VENDOR PART NUMBER
0001	00001.000	EA		333333-4202	CDSO,FORTRAN COMPILER-FTN990	*Card deck copied to cassette as Side A, Item 1.*
0001A					SIDE A,ITEM 1	
0001B					*	
0001C					LABEL SIDE A AS FOLLOWS:	
0001D					444444-0021 REV SIDE A	
0001E					CASSETTE 1 OF 2	
0001F					CONTENTS=FORTRAN COMPILER AND	*Labeling for Side A.*
0001G					COMPILER OVERLAYS	
0001H					REF DOCUMENT 666666-9901 FOR	
0001I					INSTALLATION INSTRUCTIONS	
0002	00001.000	EA		555555-4202	CDSO,AMAT,ADD MEMBER ALIAS TASK-FTN990	*Card deck copied to cassette as Side B, Item 1.*
0002A					SIDE B, ITEM 1	
0003	00001.000	EA		222222-4201	CDSO,FORTRAN RUN-TIME,PART 1 OF 3-SYS990	*Card deck copied to cassette as Side B, Item 2.*
0003A					SIDE B, ITEM 2	
0003B					*	
0003C					LABEL SIDE B AS FOLLOWS:	*Labeling for Side B.*
0003D					444444-0021 REV SIDE B	*Software package part number & revision level*

EXAMPLE OF LM FOR CASSETTE 1 SP PAGE 1

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DRAFTSMAN	DATE	CKD DRAFTSMAN	DATE	DESIGN ENGINEER	DATE	TITLE
						SP,FORTRAN PKG,CASSETTE 1 OF 2-SYS990
PD MFG	DATE	APPD. PROJECT ENGINEER	DATE	RELEASED	DATE	PROJECT NO / PART NUMBER / REV
						LM 444444-0021 C

TEXAS INSTRUMENTS INCORPORATED

DATE 06/16/76

LIST OF MATERIAL

P. NUMBER LM 444444-0021 | REV C

PRINT ITEM NUMBER	QUANTITY PER ASSEMBLY	UNIT OF ISSUE	DWG. SIZE	PART NUMBER	DESCRIPTION	VENDOR PART NUMBER
0003E					CASSETTE 1 OF 2	
0003F					CONTENTS=AMAT;RUN-TIME,PART	
0003G					1 OF 3	*Continuation of Side B labeling.*
0003H					REF DOCUMENT 666666-9901 FOR	
0003I					INSTALLATION INSTRUCTIONS	

EXAMPLE OF LM FOR
CASSETTE 1 SP
PAGE 2

938972-9901 **
PAGE 0008

RAFTSMAN DATE	CKD DRAFTSMAN DATE	DESIGN ENGINEER DATE	TITLE
			SP,FORTRAN PKG,CASSETTE 1 OF 2-SYS990
PD MFG DATE	APPD. PROJECT ENGINEER DATE	RELEASED DATE	PROJECT NO. / PART NUMBER / REV
			LM 444444-0021 C

TEXAS INSTRUMENTS INCORPORATED

DATE 06/16/76

LIST OF MATERIAL

LM 444444-0022 REV C

PRINT ITEM NUMBER	QUANTITY PER ASSEMBLY	UNIT OF ISSUE	DWG SIZE	PART NUMBER	DESCRIPTION	VENDOR PART NUMBER
0001	00001.000	EA		222222-4202	CDSO,FORTRAN RUN-TIME,PART 2 OF 3-SYS990	*Card deck copied to cassette as Side A, item 1.*
0001A					SIDE A,ITEM 1	
0001B					*	
0001C					LABEL SIDE A AS FOLLOWS:	
0001D					444444-0022 REV SIDE A	
0001F					CASSETTE 2 OF 2	
0001F					CONTENTS=RUN-TIME,PART 2 OF 3	*Labeling for Side A.*
0001G					REF DOCUMENT 666666-9901 FOR	
0001H					INSTALLATION INSTRUCTIONS	
0002	00001.000	EA		222222-4203	CDSO,FORTRAN RUN-TIME,PART 3 OF 3-SYS990	*Card deck copied to cassette as Side B, item 1.*
0002A					SIDE B, ITEM 1	
0002B					*	
0002C					LABEL SIDE B AS FOLLOWS:	
0002D					444444-0022 REV SIDE B	
0002E					CASSETTE 2 OF 2	*Labeling for Side B.*
0002F					CONTENTS=RUN-TIME,PART 3 OF 3	
0002G					REF DOCUMENT 666666 -9901 FOR	
0002H					INSTALLATION INSTRUCTIONS	

EXAMPLE OF LM FOR CASSETTE 2 SP

938772-9901 ** PAGE 0009

Software package part number & revision leve

DRAFTSMAN	DATE	CKD DRAFTSMAN	DATE	DESIGN ENGINEER	DATE	TITLE
						SP,FORTRAN PKG,CASSETTE 2 OF 2-SYS990
APPD MFG.	DATE	APPD PROJECT ENGINEER	DATE	RELEASED	DATE	PROJECT NO. / PART NUMBER / REV
						LM 444444-0022 C

TEXAS INSTRUMENTS INCORPORATED

DATE 11/09/77

LIST OF MATERIAL

PART NUMBER LM093787 003 REV C

PRINT ITEM NUMBER	QUANTITY PER ASSEMBLY	UNIT OF ISSUE	DWG. SIZE	PART NUMBER	DESCRIPTION	VENDOR PART NUMBER
0001	00001.000	EA		0939833-9901	PD,INTRODUCTION TO AMPL PACKAGE-990	
0001A					PAPER DOCUMENTS (EXCLUDING	
0001B					MANUALS) SHOULD BE	
0001C					COLLECTED & BOUND INTO ONE	
0001D					PACKAGE IN THE FOLLOWING	
0001E					ORDER:	
0001F					-INTRO TO AMPL	
0001G					-LM FORMAT & ABBREVIATIONS	
0001H					-COLLECTION OF LM'S	
0001I					-REMAINING DOCUMENTS IN LM	
0001J					ORDER	
0001K					LABEL PACKAGE AS FOLLOWS:	
0001L					AMPL SOFTWARE DOCUMENTATION	
0001M					PACKAGE,RELEASE 2.0	
0001N					PART NO.937872-0003 REV	
0002	00001.000	EA		0938972-9901	PD,LIST OF MATERIALS FORMAT,ABBREVIATION	
0003	00001.000	EA		0939802-9901	PD,AMPL PROBLEM NOTIFICATION,REL 2.0-990	
0004	00001.000	EA		0939801-9901	PD,913VDT SYSTEM(24K),DISKETTE-AMP990	
0005	00001.000	EA		0939801-9902	PD,733ASR SYSTEM(16K),DISKETTE-AMP990	
0006	00001.000	EA		0949621-9701	MNL,AMPL LANGUAGE TUTORIAL-990	

FTSMAN	DATE	CKD. DRAFTSMAN	DATE	DESIGN ENGINEER	DATE	TITLE	
		Larry R. Arnants	11-9-77			SP,AMPL SOFTWARE(FD01)-SYS990	
[illegible]	11/09/77	APPD. PROJECT ENGINEER	DATE	RELEASED	DATE	PROJECT NO.	PART NUMBER / REV
		[signature]	11-9-77	Larry R. Arnants	11-9-77	7506	LM0937872-0003 C

3849

TEXAS INSTRUMENTS INCORPORATED

DATE 11/09/77

LIST of MATERIAL

PART NUMBER LM093787[illegible]003 REV C

PRINT ITEM NUMBER	QUANTITY PER ASSEMBLY	UNIT OF ISSUE	DWG. SIZE	PART NUMBER	DESCRIPTION	VENDOR PART NUMBER
0007	00001.000	EA		0946244-9701	MNL,AMPL SYSTEM OPERATION GUIDE-990	
0008	00005.000	EA		0946265-9701	MNL,AMPL PROGRAMMING CARD-990	
0009	00001.000	EA		0949620-9701	MNL,AMPL SYS OP GUIDE,PROTO UPGRADE-990	
0010	00001.000	EA		0939801-0001	SP,913VDT SYSTEM(24K),DISKETTE-AMP990	
0011	00001.000	EA		0939801-0002	SP,733ASR SYSTEM(16K),DISKETTE-AMP990	
0012	00001.000	EA		0939801-9903	PD,911VDT SYSTEM(24K),DISKETTE-AMP990	
0013	00001.000	EA		0939801-0003	SP,911VDT SYSTEM(24K),DISKETTE-AMP990	

RAFTSMAN DATE | CKD. DRAFTSMAN DATE | DESIGN ENGINEER DATE | TITLE SP,AMPL SOFTWARE(FDD)-SYS990

PPD-MFG DATE | APPD. PROJECT ENGINEER DATE | RELEASED DATE | PROJECT NO. | PART NUMBER LM0937872-0003 | REV C

TEXAS INSTRUMENTS INCORPORATED

DATE 11/09/77

LIST MATERIAL

PART NUMBER LM0939801-0001 REV B

PRINT ITEM NUMBER	QUANTITY PER ASSEMBLY	UNIT OF ISSUE	DWG. SIZE	PART NUMBER	DESCRIPTION	VENDOR PART NUMBER
0001	00001.000	EA		0934051-0001	DISKETTE, MAGNETIC	
0001A					COPY REMAINING ITEMS TO	
0001B					ITEM 1 USING FILE NAMES AS	
0001C					SPECIFIED. SEE 939801-9901	
0001D					FOR DISKETTE LABEL.	
0002	REF	EA		0937561-1001	OBJ,TXBOOT,SYSUTL TX BOOT-TX990	
0002A					MEMORY IMAGE FORMAT	
0003	REF	EA		0937749-1001	FLO,AMPL,AMPL UTILITY(24K)-AMP990	
0003A					FILE=AMPL/SYS	
0004	REF	EA		0939622-3001	DATA,AMPSE1,ERR MSG TEXT FIL(24K)-AMP990	
0004A					FILE=AMPSE1	
0005	REF	EA		0939592-3001	DATA,PRC,ASRKSR,INITRM/GT/PUTCHR(24)-990	
0005A					FILE=ASRKSR/PRC	
0006	REF	EA		0939595-3001	DATA,PRC,CHKSUM,COMP CHKSUM MEM(24K)-990	
0006A					FILE=CHKSUM/PRC	
0007	REF	EA		0939619-3001	DATA,PRC,DUMPS,DUMP TR/EMU DATA(24K)-990	
0007A					INCLUDES EDUMP,TDUMP,TEDUMP	
0007B					FILE=DUMPS/PRC	
0008	REF	EA		0939597-3001	DATA,PRC,FLDMTR,MON FLD,TRG MEM(24K)-990	
0008A					FILE=FLDMTR/PRC	

DRAFTSMAN / DATE	CKD. DRAFTSMAN / DATE	DESIGN ENGINEER / DATE	TITLE
	Larry R. Arnants 11-9-77		SP,913VDT SYSTEM(24K),DISKETTE-AMP990

APPD. MFG. / DATE	APPD. PROJECT ENGINEER / DATE	RELEASED / DATE	PROJECT NO.		PART NUMBER	REV
11/09/77	11-9-77	Larry R. Arnants 11-9-77	7506		LM0939801-0001	B

TI 13849

PRINT ITEM NUMBER	QUANTITY PER ASSEMBLY	UNIT OF ISSUE	DWG. SIZE	PART NUMBER	DESCRIPTION	VENDOR PART NUMBER
0009	REF	EA		0939599-3001	DATA,PRC,FNDBYT,FIND SUBBYT,TRG(24K)-990	
0009A					FILE=FNDBYT/PRC	
0010	REF	EA		0939600-3001	DATA,PRC,FNDWRD,FIND SUBWRD,TRG(24K)-990	
0010A					FILE=FNDWRD/PRC	
0011	REF	EA		0939601-3001	DATA,PRC,HIST,HISTOGRAM DISPLAY(24K)-990	
0011A					FILE=HIST/PRC	
0012	REF	EA		0939617-3001	DATA,PRC,INSTR,SIM INST/INTR,TRG(24)-990	
0012A					INCLUDES BL,BLWP,INTR,RT,	
0012B					RTWP,XOP	
0012C					FILE=INSTR/PRC	
0013	REF	EA		0939603-3001	DATA,PRC,RESOLV,RSLV XREF,LD PRG(24)-990	
0013A					FILE=RESOLV/PRC	
0014	REF	EA		0939606-3001	DATA,PRC,SB,S/W BREAKPOINTS PKG(24K)-990	
0014A					FILE=SB/PRC	
0015	REF	EA		0939607-3001	DATA,PRC,SETMEM,INIT MEM,CONST(24K)-990	
0015A					FILE=SETMEM/PRC	
0016	REF	EA		0939608-3001	DATA,PRC,SIE,SIE MODE CONTROL(24K)-990	
0016A					FILE=SIE/PRC	
0017	REF	EA		0939618-3001	DATA,PRC,STAT,DSP EMU/TR STATUS(24K)-990	
0017A					INCLUDES ESTAT,TSTAT	

PRINT ITEM NUMBER	QUANTITY PER ASSEMBLY	UNIT OF ISSUE	DWG. SIZE	PART NUMBER	DESCRIPTION	VENDOR PART NUMBER
0017B					FILE=STAT/PRC	
0018	REF	EA		0937747-1001	FLO,SYS913,913VDT SYSTEM(24K)-AMP990	
0018A					FILE=SYS913/AMP	
0019	REF	EA		0939620-3001	DATA,PRC,TDUMPS,DISP TRA SAMPLS(24K)-990	
0019A					INCLUDES TDATA,TFOUR	
0019B					FILE=TDUMPS/PRC	
0020	REF	EA		0939613-3001	DATA,PRC,TIMER,TR MOD TIMING,EMU(24)-990	
0020A					FILE=TIMER/PRC	
0021	REF	EA		0939614-3001	DATA,PRC,TRACE,DSP TR DAT,TM DOM(24)-990	
0021A					FILE=TRACE/PRC	
0022	REF	EA		0939621-3001	DATA,PRC,TRSAVR,TR SAMPL VERIFY(24K)-990	
0022A					FILE=TRSAVR/PRC	

DRAFTSMAN	DATE	CKD. DRAFTSMAN	DATE	DESIGN ENGINEER	DATE	TITLE			
						SP,913VDT SYSTEM(24K),DISKETTE-AMP990			
APPD. MFG.	DATE	APPD. PROJECT ENGINEER	DATE	RELEASED	DATE	PROJECT NO.		PART NUMBER LM0939801-0001	REV B

TEXAS INSTRUMENTS INCORPORATED

DATE 11/09/77

LIST MATERIAL

PART NUMBER LM0939[illegible]-0002 REV B

PRINT ITEM NUMBER	QUANTITY PER ASSEMBLY	UNIT OF ISSUE	DWG. SIZE	PART NUMBER	DESCRIPTION	VENDOR PART NUMBER
0001	00001.000	EA		0934051-0001	DISKETTE, MAGNETIC	
0001A					COPY REMAINING ITEMS TO	
0001B					ITEM 1 USING FILE NAMES AS	
0001C					SPECIFIED. SEE 939801-9902	
0001D					FOR DISKETTE LABEL.	
0002	REF	EA		0937561-1001	OBJ,TXBOOT,SYSUTL TX BOOT-TX990	
0002A					MEMORY IMAGE FORMAT	
0003	REF	EA		0939803-3001	DATA,PRC,ASRKSR,INITRM/GT/PUTCHR(16)-990	
0003A					FILE=ASRKSR/PRC	
0004	REF	EA		0939804-3001	DATA,PRC,BLWP,SIM BLWP,TARG MEM(16K)-990	
0004A					FILE=BLWP/PRC	
0005	REF	EA		0939805-3001	DATA,PRC,CHKSUM,COMP MEM CHKSUM(16K)-990	
0005A					FILE=CHKSUM/PRC	
0006	REF	EA		0939806-3001	DATA,PRC,EDUMP,DUMP EMUL ADDRS(16K)-990	
0006A					FILE=EDUMP/PRC	
0007	REF	EA		0939807-3001	DATA,PRC,ESTAT,DISPLY EMUL STAT(16K)-990	
0007A					FILE=ESTAT/PRC	
0008	REF	EA		0939808-3001	DATA,PRC,FLDMTR,MON FLD,TRG MEM(16K)-990	
0008A					FILE=FLDMTR/PRC	
0009	REF	EA		0939809-3001	DATA,PRC,FNDBYT,FIND SUBBYT,TRG(16K)-990	

DRAFTSMAN / DATE	CKD. DRAFTSMAN / DATE	DESIGN ENGINEER / DATE	TITLE
	Larry R. Arrants 11-9-77		SP,733ASR SYSTEM(16K),DISKETTE-AMP990

APPD. / DATE	APPD. PROJECT ENGINEER / DATE	RELEASED / DATE	PROJECT NO.		PART NUMBER	REV
11/09/77	M C Mote 11-9-77	Larry R. Arrants 11-9-77	7506	" -	LM0939801-0002	B

TI 13849

PRINT ITEM NUMBER	QUANTITY PER ASSEMBLY	UNIT OF ISSUE	DWG. SIZE	PART NUMBER	DESCRIPTION	VENDOR PART NUMBER
0009A					FILE=FNDBYT/PRC	
0010	REF	EA		0939810-3001	DATA,PRC,FNDWRD,FIND SUBWRD,TRG(16K)-990	
0010A					FILE=FNDWRD/PRC	
0011	REF	EA		0939811-3001	DATA,PRC,INTR,SIM INTERRUPT,TRG(16K)-990	
0011A					FILE=INTR/PRC	
0012	REF	EA		0939812-3001	DATA,PRC,RTWP,SIM RTWP,TARG MEM(16K)-990	
0012A					FILE=RTWP/PRC	
0013	REF	EA		0939813-3001	DATA,PRC,SETMEM,INIT MEM,CONST(16K)-990	
0013A					FILE=SETMEM/PRC	
0014	REF	EA		0939814-3001	DATA,PRC,SIE,SIE MODE CONTROL(16K)-990	
0014A					FILE=SIE/PRC	
0015	REF	EA		0937748-1001	FLO,SYS733,733ASR SYSTEM(16K)-AMP990	
0015A					FILE=SYS733/AMP	
0016	REF	EA		0939815-3001	DATA,PRC,TDATA,PRNT TRACE SMPLS(16K)-990	
0016A					FILE=TDATA/PRC	
0017	REF	EA		0939816-3001	DATA,PRC,TDUMP,DMP DAT BUS SMPLS(16)-990	
0017A					FILE=TDUMP/PRC	
0018	REF	EA		0939817-3001	DATA,PRC,TEDUMP,DMP EMU/TRA DAT(16K)-990	
0018A					FILE=TEDUMP/PRC	
0019	REF	EA		0939818-3001	DATA,PRC,TIMER,TRA MOD TIMNG,EMU(16)-990	

TEXAS INSTRUMENTS INCORPORATED

DATE 11/09/77

LIST MATERIAL

LM0939 -0002 REV B

PRINT ITEM NUMBER	QUANTITY PER ASSEMBLY	UNIT OF ISSUE	DWG. SIZE	PART NUMBER	DESCRIPTION	VENDOR PART NUMBER
0019A					FILE=TIMER/PRC	
0020	REF	EA		0939819-3001	DATA,PRC,TRACE,DSP TR DAT,TM DOM(16)-990	
0020A					FILE=TRACE/PRC	
0021	REF	EA		0939820-3001	DATA,PRC,TSTAT,PRINT TRACE STAT(16K)-990	
0021A					FILE=TSTAT/PRC	

DRAFTSMAN	DATE	CKD. DRAFTSMAN	DATE	DESIGN ENGINEER	DATE	TITLE
						SP,733ASR SYSTEM(16K),DISKETTE-AMP990
APPD. MFG.	DATE	APPD. PROJECT ENGINEER	DATE	RELEASED	DATE	PROJECT NO.

PART NUMBER LM0939801-0002 REV B

TI 13849

TEXAS INSTRUMENTS INCORPORATED

DATE 11/09/77

LIST MATERIAL

PART NUMBER LM0939801-0003 REV B

PRINT ITEM NUMBER	QUANTITY PER ASSEMBLY	UNIT OF ISSUE	DWG. SIZE	PART NUMBER	DESCRIPTION	VENDOR PART NUMBER
0001	00001.000	EA		0934051-0001	DISKETTE, MAGNETIC	
0001A					COPY REMAINING ITEMS TO	
0001B					ITEM 1 USING FILE NAMES AS	
0001C					SPECIFIED. SEE 939801-9903	
0001D					FOR DISKETTE LABEL.	
0002	REF	EA		0937561-1001	OBJ,TX80OT,SYSUTL TX BOOT-TX990	
0002A					MEMORY IMAGE FORMAT	
0003	REF	EA		0937749-1001	FLO,AMPL,AMPL UTILITY(24K)-AMP990	
0003A					FILE=AMPL/SYS	
0004	REF	EA		0939622-3001	DATA,AMPSE1,ERR MSG TEXT FIL(24K)-AMP990	
0004A					FILE=AMPSE1	
0005	REF	EA		0939592-3001	DATA,PRC,ASRKSR,INITRM/GT/PUTCHR(24)-990	
0005A					FILE=ASRKSR/PRC	
0006	REF	EA		0939595-3001	DATA,PRC,CHKSUM,COMP CHKSUM MEM(24K)-990	
0006A					FILE=CHKSUM/PRC	
0007	REF	EA		0939619-3001	DATA,PRC,DUMPS,DUMP TR/EMU DATA(24K)-990	
0007A					INCLUDES EDUMP,TDUMP,TEDUMP	
0007B					FILE=DUMPS/PRC	
0008	REF	EA		0939597-3001	DATA,PRC,FLDMTR,MON FLD,TRG MEM(24K)-990	
0008A					FILE=FLDMTR/PRC	

DRAFTSMAN / DATE	CKD. DRAFTSMAN / DATE	DESIGN ENGINEER / DATE	TITLE
	Larry R. Arenants 11-9-77		SP,911VDT SYSTEM(24K),DISKETTE-AMP990

APPD. [illegible] / DATE	APPD. PROJECT ENGINEER / DATE	RELEASED / DATE	PROJECT NO.		PART NUMBER	REV
11/09/77	M A Mote 11-9-77	Larry R. Arenants 11-9-77	7506		LM0939801-0003	B

FI. 13849

PRINT ITEM NUMBER	QUANTITY PER ASSEMBLY	UNIT OF ISSUE	DWG. SIZE	PART NUMBER	DESCRIPTION	VENDOR PART NUMBER
0009	REF	EA		0939599-3001	DATA,PRC,FNDBYT,FIND SUBBYT,TRG(24K)-990	
0009A					FILE=FNDBYT/PRC	
0010	REF	EA		0939600-3001	DATA,PRC,FNDWRD,FIND SUBWRD,TRG(24K)-990	
0010A					FILE=FNDWRD/PRC	
0011	REF	EA		0939601-3001	DATA,PRC,HIST,HISTOGRAM DISPLAY(24K)-990	
0011A					FILE=HIST/PRC	
0012	REF	EA		0939617-3001	DATA,PRC,INSTR,SIM INST/INTR,TRG(24)-990	
0012A					INCLUDES BL,BLWP,INTR,RT,	
0012B					RTWP,XOP	
0012C					FILE=INSTR/PRC	
0013	REF	EA		0939603-3001	DATA,PRC,RESOLV,RSLV XREF,LD PRG(24)-990	
0013A					FILE=RESOLV/PRC	
0014	REF	EA		0939606-3001	DATA,PRC,SB,S/W BREAKPOINTS PKG(24K)-990	
0014A					FILE=SB/PRC	
0015	REF	EA		0939607-3001	DATA,PRC,SETMEM,INIT MEM,CONST(24K)-990	
0015A					FILE=SETMEM/PRC	
0016	REF	EA		0939608-3001	DATA,PRC,SIE,SIE MODE CONTROL(24K)-990	
0016A					FILE=SIE/PRC	
0017	REF	EA		0939618-3001	DATA,PRC,STAT,DSP EMU/TR STATUS(24K)-990	
0017A					INCLUDES ESTAT,TSTAT	

DRAFTSMAN	DATE	CKD DRAFTSMAN	DATE	DESIGN ENGINEER	DATE	TITLE		
						SP,911VDT SYSTEM(24K),DISKETTE-AMP990		
APPD. MFG.	DATE	APPD. PROJECT ENGINEER	DATE	RELEASED	DATE	PROJECT NO.		PART NUMBER LM0939801-0003 REV B

TI 13849

PRINT ITEM NUMBER	QUANTITY PER ASSEMBLY	UNIT OF ISSUE	DWG. SIZE	PART NUMBER	DESCRIPTION	VENDOR PART NUMBER
0017B					FILE=STAT/PRC	
0018	REF	EA		0939449-1001	FLO,SYS911,911VDT SYSTEM(24K)-AMP990	
0018A					FILE=SYS911/AMP	
0019	REF	EA		0939620-3001	DATA,PRC,TDUMPS,DISP TRA SAMPLS(24K)-990	
0019A					INCLUDES TDATA,TFOUR	
0019B					FILE=TDUMPS/PRC	
0020	REF	EA		0939613-3001	DATA,PRC,TIMER,TR MOD TIMING,EMU(24)-990	
0020A					FILE=TIMER/PRC	
0021	REF	EA		0939614-3001	DATA,PRC,TRACE,DSP TR DAT,TM DOM(24)-990	
0021A					FILE=TRACE/PRC	
0022	REF	EA		0939621-3001	DATA,PRC,TRSAVR,TR SAMPL VERIFY(24K)-990	
0022A					FILE=TRSAVR/PRC	

DRAFTSMAN DATE	CKD. DRAFTSMAN DATE	DESIGN ENGINEER DATE	TITLE
			SP,911VDT SYSTEM(24K),DISKETTE--AMP990
APPD. MFG. DATE	APPD. PROJECT ENGINEER DATE	RELEASED DATE	PROJECT NO.
			PART NUMBER LM0939801-0003 REV B

APPLICATION		REVISIONS			
NEXT ASSY	USED ON	LTR	DESCRIPTION	DATE	APPROVED
	7506				

| | | | | |

AMPL SYSTEM PROBLEM REPORT

1. IT IS POSSIBLE FOR THE USER TO GENERATE EVENTS FASTER THAN THE OPERATING SYSTEM CAN HANDLE THEM THUS CAUSING THE SYSTEM TO "LOCK UP". THIS GENERALLY HAPPENS WHEN THE EMULATOR OR TRACE MODULE IS SET UP TO INTERRUPT ON AN EVENT BUT NOT STOP (THAT IS, IN A COUNTING MODE). IF AN EVENT IS OCCURRING ON EVERY SAMPLE AN INTERRUPT WILL POSSIBLY BE GENERATED AS OFTEN AS EVERY 10 MICROSECONDS. THE USER SHOULD BE AWARE OF THIS POSSIBILITY AND IF IT HAPPENS THE ONLY RECOURSE IS TO DO A SYSTEM RESTART OR REBOOT.

2. IF THE BUFFER MODULE IS SWITCHED FROM INTERNAL TO EXTERNAL CLOCK OR VICE-VERSA OR AN EXTERNAL CLOCK FAILS THE TMS9900 CHIP IS AUTOMATICALLY POWERED DOWN. TO RECOVER FROM THIS THE USER MUST HALT THE EMULATOR AND START IT TO CAUSE THE FLIP-FLOP THAT KEEPS THE POWER OFF TO BE RESET AND POWER TO BE RESTORED TO THE 9900 CHIP. IF THIS FAILS THE ONLY RECOURSE IS TO REBOOT THE SYSTEM AND RELOAD AMPL.

3. THE TARGET 9900 ADDRESS AND DATA BUS ARE USED BY THE HOST SOFTWARE TO FORCE LOAD TRAPS AND TO FETCH INTERNAL REGISTERS WHEN THE EMULATOR IS IN HALT. THE USER SHOULD BE AWARE OF THIS IF HE IS MONITORING THE ADDRESS OR DATA BUS FOR SOME OTHER REASON.

4. THE "DELAY" COUNTER ON THE TEVT COMMAND TO THE TRACE MODULE IS NOT SET UP CORRECTLY BY THE AMPL S/W IN THIS RELEASE. THE DELAY COUNT IS ALWAYS ZERO NO MATTER WHAT IS ENTERED. THIS WILL BE FIXED IN THE NEXT RELEASE OF THE S/W PACKAGE BUT IF THIS IS AN INSURMOUNTABLE PROBLEM TO A PARTICULAR APPLICATION PATCHES TO FIX THE PROBLEM MAY BE OBTAINED THROUGH CUSTOMER SUPPORT.

APPLICATION		REVISIONS			
NEXT ASSY	USED ON	LTR	DESCRIPTION	DATE	APPROVED
	7506				

REV																																		
SHEET																																		
REV STATUS OF SHEETS	REV																																	
	SHEET																																	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES
ANGLES ±1°
3 PLACE DECIMAL ± 010
2 PLACE DECIMAL ± 02

IDENTIFYING NUMBERS SHOWN IN PARENTHESES FOR REFERENCE ONLY

INTERPRET DWG IN ACCORDANCE WITH MIL STD 100

	DATE
DWN	
CHK	
ENGR	
QA	
APVD	
CONTR NO	
DESIGN ACTIVITY RELEASE	

TEXAS INSTRUMENTS
INCORPORATED
Equipment Group Dallas, Texas

PD, 913VDT SYSTEM (24K), DISKETTE-AMP990

SIZE	CODE IDENT NO	DRAWING NO
A	96214	939801-9901
SCALE	REV. B	SHEET 1 of 2

TI-0033-C

DISC I.D. : AMPL 913 SYSTEM 939801-0001*B

DSC ALLOC. UNITS(TOTAL): 333 FREE: 79 BAD: 0

FILE	TYPE	PT	ALLOC. UNITS
AMPL/SYS	S	U	49
AMPSE1	R	U	18
ASRKSR/PRC	S	U	8
CHKSUM/PRC	S	U	8
DUMPS/PRC	S	U	11
FLDMTR/PRC	S	U	8
FNDBYT/PRC	S	U	8
FNDWRD/PRC	S	U	8
HIST/PRC	S	U	8
INSTR/PRC	S	U	8
RESOLV/PRC	S	U	8
SB/PRC	S	U	11
SETMEM/PRC	S	U	8
SIE/PRC	S	U	8
STAT/PRC	S	U	8
SYS913/AMP	S	U	39
TDUMPS/PRC	S	U	8
TIMER/PRC	S	U	8
TRACE/PRC	S	U	8
TRSAVR/PRC	S	U	8

DISKETTE LABEL FOR 939801-0001:

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939801-0001 REV AMPL 913 VDT SYSTEM (24K) RELEASE 2.0
CONTENTS=AMPL UTILITY, PROCS AND SYS 913. SEE DOC.
939801-9901 (DISKETTE CATALOG) FOR DETAILS.
REF. MANUAL 946244-9701 (24K OP GUIDE) AND 949621-9701
(TUTORIAL) FOR OPERATING INSTRUCTIONS.

APPLICATION		REVISIONS			
NEXT ASSY	USED ON	LTR	DESCRIPTION	DATE	APPROVED
	7506				

REV																																		
SHEET																																		
REV STATUS OF SHEETS	REV																																	
	SHEET																																	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES
ANGLES ±1°
3 PLACE DECIMAL ± 010
2 PLACE DECIMAL ± 02

IDENTIFYING NUMBERS SHOWN IN PARENTHESES FOR REFERENCE ONLY

INTERPRET DWG IN ACCORDANCE WITH MIL STD 100

	DWN	DATE
	CHK	
	ENGR	
	QA	
	APVD	
	CONTR NO	
	DESIGN ACTIVITY RELEASE	

TEXAS INSTRUMENTS
INCORPORATED
Equipment Group Dallas, Texas

PD, 733ASR SYSTEM (16K), DISKETTE-AMP990

SIZE	CODE IDENT NO	DRAWING NO
A	96214	939801-9902

SCALE	REV. B	SHEET 1 of 2

TI-0023-C

DISC I. D. : AMPL 733 SYSTEM 939801-0002*B

DSC ALLOC. UNITS(TOTAL): 333 FREE: 114 BAD: 0

FILE	TYPE	PT	ALLOC. UNITS
ASRKSR/PRC	S	U	8
BLWP/PRC	S	U	8
CHKSUM/PRC	S	U	8
EDUMP/PRC	S	U	8
ESTAT/PRC	S	U	8
FLDMTR/PRC	S	U	8
FNDBYT/PRC	S	U	8
FNDWRD/PRC	S	U	8
INTR/PRC	S	U	8
RTWP/PRC	S	U	8
SETMEM/PRC	S	U	8
SIE/PRC	S	U	8
SYS733/AMP	S	U	69
TDATA/PRC	S	U	8
TDUMP/PRC	S	U	8
TEDUMP/PRC	S	U	8
TIMER/PRC	S	U	8
TRACE/PRC	S	U	8
TSTAT/PRC	S	U	8

DISKETTE LABEL FOR 939801-0002:

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939801-0002 REV AMPL 733 ASR SYSTEM (16K), RELEASE 2.0
CONTENTS=SYS 733 AND PROCS. SEE DOC. 939801-9902
(DISKETTE CATALOG) FOR DETAILS.
REF MANUAL 949620-9701 (16K OP GUIDE) FOR OPERATING
INSTRUCTIONS.

APPLICATION		REVISIONS			
NEXT ASSY	USED ON	LTR	DESCRIPTION	DATE	APPROVED
	7506				

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DISC I. D. : AMPL 911 SYSTEM 939801-0003*B

DSC ALLOC. UNITS(TOTAL): 333 FREE: 69 BAD: 0

FILE	TYPE	PT	ALLOC. UNITS
AMPL/SYS	S	U	49
AMPSE1	R	U	18
ASRKSR/PRC	S	U	8
CHKSUM/PRC	S	U	8
DUMPS/PRC	S	U	11
FLDMTR/PRC	S	U	8
FNDBYT/PRC	S	U	8
FNDWRD/PRC	S	U	8
HIST/PRC	S	U	8
INSTR/PRC	S	U	8
RESOLV/PRC	S	U	8
SB/PRC	S	U	11
SETMEM/PRC	S	U	8
SIE/PRC	S	U	8
STAT/PRC	S	U	8
SYS911/AMP	S	U	49
TDUMPS/PRC	S	U	8
TIMER/PRC	S	U	8
TRACE/PRC	S	U	8
TRSAVR/PRC	S	U	8

DISKETTE LABEL FOR 939801-0003:

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PROPERTY OF TEXAS INSTRUMENTS INCORPORATED

939801-0003 REV AMPL 911 VDT SYSTEM (24K). RELEASE 2.0
CONTENTS=AMPL UTILITY,PROCS AND SYS 911. SEE DOC.
939801-9903 (DISKETTE CATALOG) FOR DETAILS.
REF. MANUAL 946244-9701 (24K OP GUIDE) AND 949621-9701
(TUTORIAL) FOR OPERATING INSTRUCTIONS.

3

SOFTWARE SUBSCRIPTION UPDATE

SUBSCRIPTION TX/AMPL OBJECT
SUBSCRIPTION NUMBER 937880-0003
UPDATE FROM 11-15-77 TO 1-15-78
MEDIA diskette
SHEET 1 OF 1

DESCRIPTION OF CHANGES

PART CHANGED	DESCRIPTION OF CHANGE	CONTAINED IN PACKAGE
TX/AMPL	Release 2.1 of the TX-AMPL Software Package (Release 1.1 of the Prototyping System upgrade) has been issued, effective 15 January 1978. Refer to the update document (2261788-9901) for details.	937832*D

LIST OF MATERIALS:

1. 2261788-9901**Update Document, TX-AMPL, Release 2.1

2. 937872-0003*D TX-AMPL Software (omit mnl 946265-9701)

A

APPLICATION		REVISIONS			
NEXT ASSY	USED ON	LTR	DESCRIPTION	DATE	APPROVED
	7506				

| | | | | |

This release of the AMPL software package serves three primary functions: (1)Provide emulation support for the TMS9980 microprocessor (2)Enhance the AMPL software functions and (3)Fix all known software problems discovered in the previous release.

The updates to support the TMS9980 emulator are transparent to the user for the most part. Changes were made to the device interface routines for the emulator and very minor changes were made to the AMPL functions to support the operational differences between the 9980 and the 9900 buffer modules.

A new command was added to the AMPL functions to allow the user to exit AMPL, edit a procedure using the TX Text Editor, and return to AMPL without destroying the current operating environment. The ability to enter expressions (as opposed to just constants) on the AMPL Read function was also added. A new set of procedures were added to the AMPL procedure library to simplify setup of the emulator and trace module trace and breakpoint specification. Other minor changes were made to the AMPL system and all are well documented in the the updated users guide.

The "EINT" command was updated to be more reliable in initializing the emulator to some known state particularly after changing the clock source for the microprocessor(i.e. "internal", or "external"). A problem was also fixed in the target CRU functions which was causing data to be read and written incorrectly. The automatic read after write function check was removed from the AMPL software to allow the user to do memory mapped I/O if he chooses without getting error messages.

The goal of this release is to increase the usefulness and reliability of the AMPL system. Any questions, problems or suggestions concerning the AMPL system should be directed to the Customer Support Staff of TEXAS INSTRUMENTS INCORPORATED.