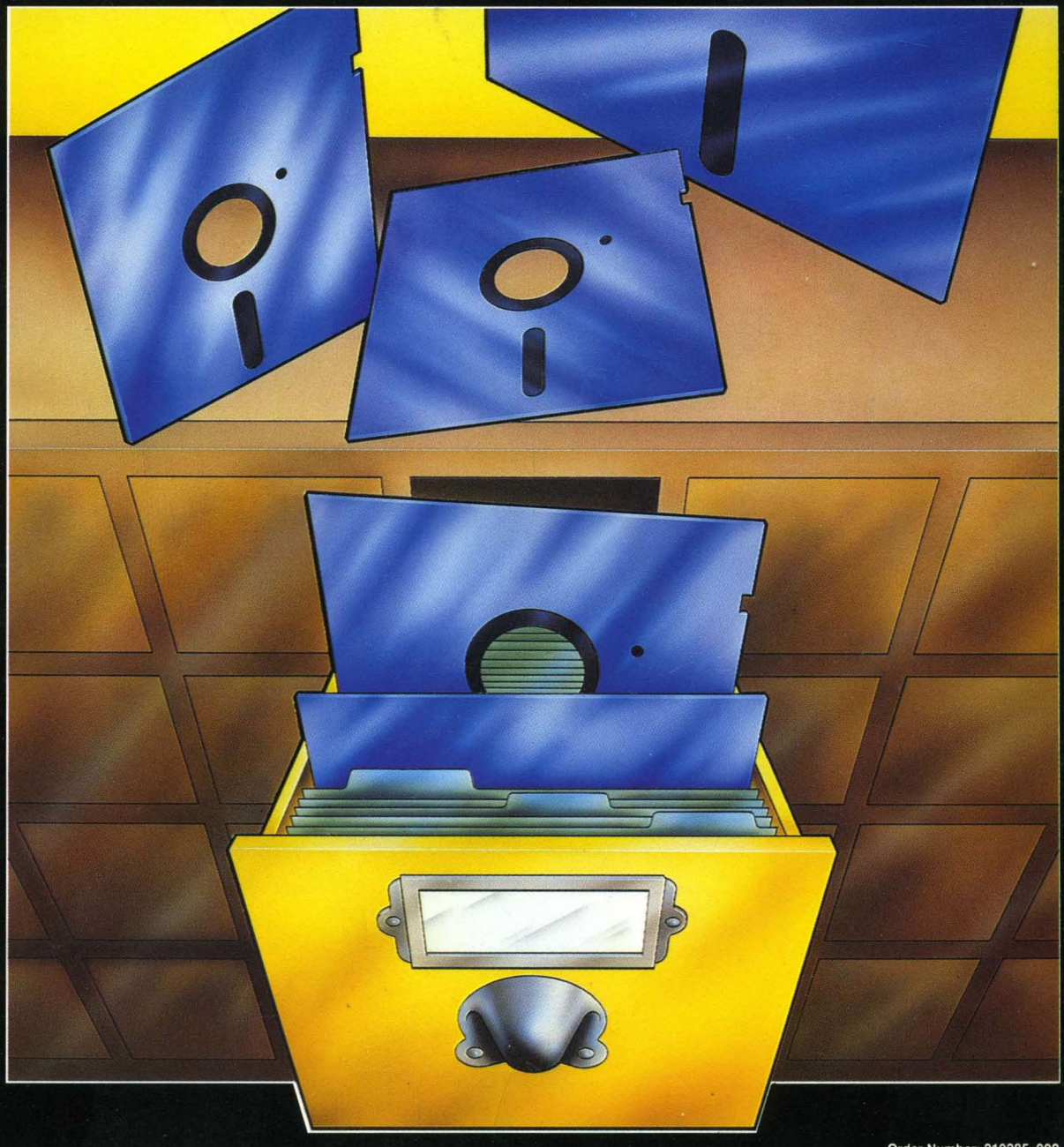
intel

Insite™ User's Program Library Catalog



Order Number: 210385-002

intel

Insite™ User's Program Library Catalog

1983/84

Table of Contents

Chapter 1

GENERAL INFORMATION

Chapter 2

PROGRAM DESCRIPTIONS

Appendix

SAMPLE FORMS

General Information

1

INSITE™ USER'S PROGRAM LIBRARY

- **Programs for 8048, 8051, 8080/8085, and 8086/8087/8088 Processors**
- **Accepted Program Submittals Entitle You to a Free Membership or Free Program Package**
- **Worldwide Offices to Serve You**
- **Diskettes, Paper Tapes, and Listings Available for Library Programs**
- **Program Library Catalog Offering Hundreds of Programs**
- **Updates of New Programs Sent During Subscription Period**

Insite, Intel's Software Index and Technology Exchange Library, is a varied collection of programs and routines that have been written by users of Intel microcomputers, single-board computers, and development systems. This expanding library of programs covers a broad range of software tools that includes monitors, conversion routines, peripheral drivers, translators, math packages, and even games. As a library member, you can acquire a copy of any program within the library on any of its available types of media. By taking advantage of the availability of existing library programs, numerous hours of coding and debugging time can be saved and routine or redundant programming operations can be eliminated. The Insite Program Library also serves as a learning tool for individuals unfamiliar with assembly or high-level languages associated with Intel's family of microcomputers.

Membership. Membership in Insite is available on an annual basis. Intel customers may become members through an accepted program contribution or paid membership fee.

Program Submittals. The Insite Library is built on program submittals contributed by users. Customers are encouraged to submit their programs. (Details and forms are available through the Insite Library.) For each accepted program, submittors will receive a choice of three free programs (A, B, C, or D category), or free membership with Insite for one year.

Program Library Service. PAPER TAPES, DISKETTES OR SOURCE LISTINGS are available for every program in Insite. Diskettes are available on single or double density. Membership is required to purchase programs.

Insite™ Program Library Catalog. Each member will be sent the Program Library Catalog consisting of an abstract for each program indicating the function of the routine, required hardware and software, and memory requirements.

Insite members will be updated with abstracts of new programs submitted to the Library during the subscription period. For catalog and yearly subscription fee please refer to the Intel OEM Price List or contact the nearest Insite or Intel Sales Office.

INSITE OFFICES ARE WORLDWIDE, WITH FIVE LOCATIONS TO SERVE YOU:

NORTH AMERICA
Intel Corporation
3065 Bowers Avenue
Santa Clara, California 95051
ATTN: Insite User's Program Library
Telephone: 408-987-8080

THE ORIENT
Intel Japan K.K.
5-6 Tohkohdai, Toyosato-cho,
Tsukuba-gun, Ibaraki, 300-26, Japan
ATTN: Insite User's Program Library
Telephone: 029747-8511

EUROPE

Intel Corporation S.A.R.L.
5 Place de la Balance
Silic 223
94528 Rungis Cedex, France
ATTN: Insite User's Program Library
Telephone: 0687-22-21

Intel Semiconductor GmbH
Seidlstrasse 27
8000 Muenchen 2
West Germany
ATTN: Insite User's Program Library
Telephone: 089-5389-1

Intel Corporation (U.K.) Ltd.
Pipers Way
Swindon SN3 LRJ
Wiltshire, England
ATTN: Insite User's Program Library
Telephone: 0793-488-388

GENERAL INFORMATION

The Insite program catalog is designed to highlight the Library services with concise, fundamental instructions.

This section will outline ordering procedures, media availability, pricing, program verification and detailed program submittal guidelines and requirements.

ORDERING PROCEDURES

An order form must be completed with each program order. A sample form is included in the Forms Section.

Each order will be filled according to the specifications of the user and completed on the order form. Any errors in order information will be the responsibility of the user, and the user must bear the cost of reordering.

No exchanges will be made for programs found not to fulfill the user's needs.

Refunds will not be issued under any circumstances.

PROGRAM MEDIA

Programs are available on:
- —Intel ISIS-II Formatted Diskette (non-system single or double density)
- —PDS Formatted Diskette
- —CP/M Formatted Diskette (non-system single or double density)
- —Printed Source Listing
- —Intel ASCII-Coded Paper Tape

Media availability per individual program is referenced at the end of each program description. Media must be specified on order forms to ensure prompt processing. (Note: Not all programs are available on all media offered.)

All programs on diskette are provided under ISIS format unless CP/M-80 format is requested.

PROGRAM CODE

Programs offered in source code require assembly/compilation. The programming language for each program is stated on the program information sheet. Assemblers/compilers required are Intel standard. Program assembly/compilation is the responsibility of the user.

Programs offered in absolute object code are furnished as executable object code.

PRICE CODES

Price codes are indicated for each program by a letter in parentheses following media availability in the program description, e.g. "DISKETTE (A)".

Letter Codes are:	DISKETTES:	A (single or double density)	E	I
		B	F	J
		C	G	K
		D	H	L
	PAPER TAPES:	P (includes printed source listing when available)		
	LISTINGS:	L		

Refer to the Insite Price List for the corresponding program prices.

Documentation, when available, is included with programs at no additional cost.

PROGRAM VERIFICATION

Programs should operate properly under the author's original configuration, however, Insite cannot assume responsibility for any other configurations. "Program Certification and Review" forms are included in the Forms Section to determine whether a program functions accurately and according to the author's documentation.

Responses to program accuracy are encouraged and appreciated.

PROGRAM REVISIONS

Program revisions are submitted in the same manner as original program submittals.

The revision submitted should be referenced in a cover letter, noting the Insite program order number and detailing the specific revisions.

SUBMITTAL REQUIREMENTS

Programs submitted for Insite review must follow the guidelines listed below:

Programs must be written in a language capable of compilation and assembly by the currently-supported version of an Intel standard compiler/assembler. Accepted languages are documented in the following manuals available through Intel's Literature Department.

- BASIC-80 Reference Manual, Order No. 980758
- iCIS-COBOL Language Reference Manual, Order No. 980927
- FORTRAN-80 Programming Manual, Order No. 980481
- FORTRAN-86 User's Guide, Order No. 121570
- Pascal-80 User's Guide, Order No. 981015
- Pascal-86 User's Guide, Order No. 121539
- PL/M-80 Programming Manual, Order No. 980268
- PL/M-86 Programming Manual, Order No. 980466
- MCS-48 and UPI-41A Assembly Language Manual, Order No. 980255
- MCS-86 Macro Assembly Language Reference Manual, Order No. 121703
- 8080/8085 Assembly Language Programming Manual, Order No. 980940
- 8086/8087/8088 Macro Assembly Language Reference Manual for 80/85 Based Development System, Order No. 121623
- 8086/8087/8088 Macro Assembly Language Reference Manual for 80/86 Based Development System, Order No. 121703
- 8089 Assembly Language Reference Manual, Order No. 980255
- Microsoft BASIC Compiler Reference Manual, Order No. 121805
- Microsoft BASIC-80 Reference Manual, Order No. 121806
- Microsoft BASIC Reference Book, Order No. 121857
- Microsoft FORTRAN-80 Reference Manual, Order No. 121798
- Microsoft FORTRAN-80 User's Manual, Order No. 121799
- Microsoft M/Sort Reference Manual, Order No. 121809
- Microsoft Utility Software Manual, Order No. 121797

A well-documented source code furnished on an ISIS-formatted 8″ diskette, CP/M-formatted 8″ diskette, PDS 5 ¼″ diskette, or ASCII-coded paper tape.

A source listing of the program must be included. This must be the output listing of a compilation or an assembly. No consideration will be given to incomplete programs or duplications of programs already in the Library.

A link and locate listing.

A demonstration program which assures the validity of the contributed program must be included. This must show the accurate operation of the program.

A complete submittal form.

Licensed software or copyrighted material must be accompanied by a written release from the appropriate, authorized person.

INTERPRETING CATALOG ENTRIES

(1) **AD6, COMMUNICATION: INTELLEC MODEL 220/230 TO TIMESHARING COMPUTER** (2)

(3) **Submitted by:** Dave Mabry, Chrysler Corporation, Detroit, MI

(4) **Abstract:** This program reads ISIS-II file and sends it out Serial Port #2. Channel #2 can talk to a modem or acoustic coupler, so this program can be used to load a file from the Intellec 220/230 to a timesharing computer.

(5) **Hardware Required:** Intellec Model 220/230

Software Required: ISIS-II

(6) **Registers Modified:** All. **Required:** RAM/255 bytes minimum, 512 bytes nominal; ROM/none; BLOCKS/55

(7) **Programming Language:** Assembly. **Assembler/Compiler:** 8080/8085 Macro Assembler, V3.0

(8) **Libraries:** SYSTEM.LIB

(9) **Media Availability (Price Code) (10):** DISKETTE (C), SRC, OBJ; PAPER TAPE (P), SRC; SOURCE LISTING (L); DOCUMENTATION

(1) The Insite Catalog order number.

(2) Titles of programs have been selected by the submitting authors to describe the general functions of the program.

(3) The person who submitted the program (not necessarily the programmer).

(4) The abstract gives a general description of the program and its functions. This summary, if not provided by the programmer in abstract form, is taken from the program documentation.

(5) Hardware and software requirements provided by the programmer. A program is not necessarily limited to this hardware only.

(6) Registers modified, RAM and ROM requirements and blocks are requested, and usually provided by the author.

(7) The programming language and assembler/compiler used to create the program.

(8) Libraries have been linked into programs where ABS. OBJ is included. For programs that have not been linked, or that require changes, the user will need the listed libraries. (In some cases, this has not been specified by the programmer.)

(9) Media availability indicates the form of media you can order the program on. Not all programs are offered in all media.

(10) Refer to the separate Insite price list to determine cost corresponding to the alpha price code.

LIST OF PROGRAMS
ALPHABETICAL, BY APPLICATION

Program Descriptions

2

MONITORS

AA1, MONITOR: INTELLEC 8/MOD80

Submitted by: Frank Faff, Atlantic Research Corp., Alexandria VA

Abstract: This monitor provides most commonly used debug functions in a single 256-byte EPROM. Functions include: -GOTO, -SUBSTITUTE, -DISPLAY, -HEXARITHMETIC, -FIND/MOVE BYTE. With modifications, can be used with any user-designed hardware which has ASCII I/O capability. ASCII characters used: 0-9, A-F, G, H, M, and S. Output is ASCII characters corresponding to hexadecimal memory addresses and contents.

Hardware Required: Intellec 8/MOD80, TTY-ASR33
Software Required: None
Registers Modified: All. **Required:** RAM/11 bytes for stack; ROM/256 bytes; BLOCKS/81
Programming Language: Assembly. **Assembler/Compiler:** 8080 Macro Assembler, V3.0
Libraries: SYSTEM.LIB
Media Availability (Price Code): DISKETTE (A), SRC, OBJ: PAPER TAPE (P), SRC, HEX; SOURCE LISTING (L); DOCUMENTATION

AA2, MONITOR: iSBC 86/12

Submitted by: Intel Corporation

Abstract: This program is the iSBC 957 (not 957A or 957B) interface and execution software. It is a stand-alone debug monitor providing: Memory/register display/modification, -Program execution with breakpoints and single-step, -Port I/O, -Byte/word find, -String comparison, -Hex arithmetic.

Hardware Required: Intellec 8086-based; iSBC 86/12
Software Required: PL/M-86
Registers Modified: All. **Required:** RAM/367 bytes; ROM/6034 bytes; BLOCKS/800
Programming Language: PL/M-86. **Assembler/Compiler:** PL/M-86,V2.1
Media Availability (Price Code): DISKETTE (D); SRC, OBJ; SOURCE LISTING (L); DOCUMENTATION

AA3, MONITOR: SDK-85, V2.0

Submitted by: c/o Intel Corporation

Abstract: This program provides minimum level functions for the SDK-85: -Memory/register manipulation; -Program load/execution; -Single-step capability.

Hardware Required: SDK-85
Software Required: None
Registers Modified: All. **Required:** RAM/38 bytes + stack; ROM/2K bytes; BLOCKS/705
Programming Language: Assembly. **Assembler/Compiler:** 8080/8085 Macro Assembler, V4.0
Media Availability (Price Code): DISKETTE (B), SRC, OBJ; SOURCE LISTING (L); DOCUMENTATION

AA4, MONITOR: SDK-86 SERIAL, V1.1

Submitted by: Janet Takami, Intel Corporation

Abstract: This program is the ROM-based interactive monitor with commands for examining/modifying registers and memory, controlling program execution using breakpoints or single step, moving memory blocks, inputting from or outputting to I/O ports, and reading and writing HEX/Object files on paper tape.

Hardware Required: SDK-86, ASR-33 Teletype or CRT
Software Required: N/A
Registers Modified: All. **Required:** RAM/256 bytes; ROM/4 bytes; BLOCKS/398
Programming Language: PL/M. **Assembler/Compiler:** PL/M-86, V1.0
Media Availability (Price Code): DISKETTE (B), SRC, OBJ: SOURCE LISTING (L); DOCUMENTATION

AA5, MONITOR: SDK-86 KEYPAD

Submitted by: Janet Takami, Intel Corporation

Abstract: This program is a ROM-based Keypad monitor for the SDK-86, providing a moderate-level capability to examine/modify memory/registers, and execute programs.

Hardware Required: SDK-86
Software Required: N/A
Required: RAM/256 bytes; ROM/4K bytes; BLOCKS/312
Programming Language: PL/M. **Assembler/Compiler:** PL/M-86, V1.0
Media Availability (Price Code): DISKETTE (A), SRC, OBJ: SOURCE LISTING (L); DOCUMENTATION

AA6, MONITOR: INTELLEC DEVELOPMENT SYSTEM, V2.0

Submitted by: Intel Corporation

Abstract: This program is an interactive monitor handling six I/O devices and utility routines for display/modification of memory/registers.

Hardware Required: Intellec Development System 800
Software Required: N/A
Registers Modified: All. **Required:** RAM/2K bytes
Programming Language: Assembly. **Assembler/Compiler:** 8080 Macro Assembler, V2.4
Libraries: SYSTEM.LIB
Media Availability (Price Code): SOURCE LISTING (L)

AA7, MONITOR: iSBC 544™

Submitted by: D. Jurasek, c/o Intel Corporation

Abstract: This program is a minimal monitor providing: -Memory/register display/modification; -Program execution; -Console/paper tape I/O support.

Hardware Required: iSBC 544, EPROM 2716, PROM programming capabilities
Software Required: N/A
Required: ROM/16K; BLOCKS/667
Programming Language: Assembly. **Assembler/Compiler:** 8080/8085 Macro Assembler, V3.0
Media Availability (Price Code): DISKETTE (B), SRC, OBJ; SOURCE LISTING (L); DOCUMENTATION

AA8, EXECUTIVE: REAL TIME

Submitted by: Ted Clowes, Cubic Corporation, San Diego, CA

Abstract: This is a control design to perform the necessary scheduling, task initialization and termination that can be found in a Real Time environment.

Hardware Required: 8080, Timer that causes periodic interrupt
Software Required: N/A
Registers Modified: All. **Required** RAM/22 bytes minimum, 42 bytes recommended; ROM/256 bytes; BLOCKS/63
Programming Language: Assembly. **Assembler/Compiler:** 8080/8085 Macro Assembler, V3.0
Libraries: SYSTEM.LIB
Media Availability (Price Code): DISKETTE (A), SRC, OBJ; PAPER TAPE (P), SRC; SOURCE LISTING (L); DOCUMENTATION

AA9, MONITOR; iSBC 250 1-MEGABIT BUBBLE MEMORY

Submitted by: Paul Wells, Intel Magnetics, Intel Corporation

Abstract: This BMDS software package provides modules for the interfacing and use of the iSBC 250 1-megabit bubble memory board. The package is designed to be used in an Intellec Microcomputer Development System or configured with same, then used with any iSBC host board.

Hardware Required: iSBC 250, Intellec Model 230 or Intellec Model 800
Software Required: ISIS-II
Required: RAM/32K bytes; BLOCKS/2527
Programming Language: Assembly. **Assembler/Compiler:** 8080/8085 Macro Assembler, V3.0
Media Availability (Price Code): DISKETTE (D), SRC, OBJ, LST; SOURCE LISTING (L); DOCUMENTATION

AA10, MONITOR: BUBBLE MEMORY DEVELOPMENT SOFTWARE FOR INTEL BPK-72

Submitted by: Paul Wells, Intel Corporation

Abstract: This program, BMDS-86, is a bubble memory monitor which performs basic communication with, and diagnostics on, the BPK-72 1-Megabit Bubble Memory Prototype Kit.

Hardware Required: SDK-86 and BPK-72 kits
Software Required: None
Required: ROM/4K (EPROM)
Programming Language: 8086 Assembly Language. **Assembler/Compiler:** MCS-86 Macro Assembler, V2.1
Media Availability (Price Code): DISKETTE (B), SRC, OBJ, LST; DOCUMENTATION

AA11 MONITOR: iSBC-254 BUBBLE MEMORY BOARD MONITOR

Submitted by: Chee Ho, Intel Corporation

Abstract: This program provides the user with an immediate interactive interface to the iSBC-254 Bubble Memory Board when used with Intel's MDS and ISIS-II operating system.

Hardware Required: MDS-800 or Intellec Series-II 220/225/230/235/240/245 iSBC-254 Bubble Memory Board
Software Required: ISIS-II, V4.1
Required: RAM/32K bytes, ROM/none, BLOCKS/1080
Programming Language: Assembly. **Assembler/Compiler:** 8080/8085 Macro Assembler V3.0
Media Availability (Price Code): DISKETTE (D),SRC; DOCUMENTATION.

AA12, INTERPRETER: INTERACTIVE 8087 INSTRUCTION INTERPRETER

Submitted by: Bill Rash, Intel Corporation

Abstract: This program allows quick examination of 8087 behavior and verifies its operation. Version I87 allows all 8087 instructions to be executed and all 8087 related values to be displayed for each examination. All 8087 supported data types may be set and displayed in hex and decimal. Data formats and instructions are compatible with ASM-86. A version of I87, called EI87, offers the same functions, except using the 8087 emulator. I87 provides a window into the 8087 environment. From the console any aspect of an 8087 may be examined and modified. Individual instructions may be typed, I87 immediately executes them, and the results may be examined.

Hardware Required: 86/20 or 88/20 or 86/10 with E8087, or 88/10 with E8087, with iSBC 957A monitor on an 86/12 board and download link
Software Required: iSBC 957A monitor and iSBC 861
Registers Modified: All. **Required:** RAM/10K for 86/20, 26K for 86/10; BLOCKS/1938
Programming Language:PL/M and Assembly. **Assembler/Compiler:** PL/M-86; 8086/8087/8088 Macro Assembler
Media Availability (Price Code): DISKETTE (D), SRC, OBJ, ABS.OBJ; DOCUMENTATION (Extensive)

AA13, MONITOR: HSE-49 EXPANSION MONITOR

Submitted by: Roger Finger, Intel Corporation

Abstract: This program is a hardware/software modification on HSE-49 to support the following enhancements as new keyboard functions: 1) Download a user program stored in a 2716 to HSE memory; 2) Compare PROM to HSE-49 RAM; 3) Check for burned out LED segments; 4) Check for stuck bits and short-circuit faults; 5) Provides parser tables for users to write their own routines.

Hardware Required: HSE-49 plus expansion monitor firmware, a zero insertion force socket will be added in the prototype area
Software Required: Two HEX files to burn into firmware
Registers Modified: R0-R7. **Required:** RAM/None; ROM/2K-2716; BLOCKS/1495
Programming Language: Assembly. **Assembler/Compiler:** ASM-48, V4.0
Media Availability (Price Code): DISKETTE (C), SRC, OBJ; DOCUMENTATION

AA14, MONITOR: iSBC 80/05 or 80/04

Submitted by: c/o Intel Corporation

Abstract: This program is a 2K-byte debug monitor for the iSBC 80/05 or 80/04, providing: -Simple memory/register display; -Program execution with breakpoints; -Modification commands; -Paper tape I/O support using a TTY.

Hardware Required: iSBC 80/05 or 80/04 with console CRT or TTY; PROM programming capabilities
Software Required: None
Registers Modified: All. **Required:** RAM/31 bytes + stack; ROM/1714 byte; BLOCKS/454
Programming Language: Assembly. **Assembler/Compiler:** 8080/8085 Macro Assembler, V3.0
Libraries: SYSTEM.LIB
Media Availability (Price Code): DISKETTE (A), SRC, OBJ; SOURCE LISTING (L); DOCUMENTATION

AA15, MONITOR: iSBC 80/10

Submitted by: Wayne Stahnke, Wayne Stahnke Co., Santa Monica, CA

Abstract: This is a resident interactive monitor for the iSBC 80/10. Some features included: All commands are checked for validity before being executed. Paper tape input is buffered to allow checksum validation before being installed. The "Program Execute" command permits the setting and clearing of breakpoints. Provision is made for a front-panel hardware interrupt switch.

Hardware Required: iSBC 80/10, ASR-33 TTY or equivalent
Software Required: N/A
Registers Modified: All. **Required:** RAM/64 bytes; ROM/1024 bytes; BLOCKS/297
Programming Language: Assembly. **Assembler/Compiler:** 8080/8085 Macro Assembler, V3.0
Libraries: SYSTEM.LIB
Media Availability (Price Code): DISKETTE (A), SRC, OBJ; SOURCE LISTING(L)

AA16, MONITOR: iSBC 80/10 OR 80/10A

Submitted by: c/o Intel Corporation

Abstract: This program runs on the iSBC 80/10 board and is designed to provide the user with a minimal monitor with which to examine and change memory or CPU registers, load a program (in absolute hex) into RAM, and execute instructions already in memory. The monitor also provides the user with routines for performing console I/O and paper tape I/O.

Hardware Required: iSBC 80/10 or 80/10A, PROM programming capabilities, CRT or TTY
Software Required: None
Registers Modified: All. **Required:** RAM/16 + stack usage; ROM/1374 bytes; BLOCKS/512
Programming Language: Assembly. **Assembler/Compiler:** 8080/8085 Macro Assembler, V3.0
Libraries: SYSTEM.LIB
Media Availability (Price Code): DISKETTE (A), SRC, OBJ; SOURCE LISTING (L); DOCUMENTATION

AA17, MONITOR: iSBC 80/20 or 80/20-4

Submitted by: c/o Intel Corporation

Abstract: This program runs on the iSBC 80/20 board and is designed to provide the user with a minimal monitor with which to examine and change memory or CPU registers, load a program (in absolute hex) into RAM, and execute instructions already in memory. The monitor also provides the user with routines for performing console I/O and paper tape I/O. The 80/20 monitor can reside in two 8708 PROMs, both of which are required for monitor operations.

Hardware Required: iSBC 80/20 or 80/20-4; PROM programming capabilities
Software Required: None
Registers Modified: All. **Required:** RAM/45 + stack; ROM/1708 bytes; BLOCKS/564
Programming Language: Assembly. **Assembler/Compiler:** 8080/8085 Macro Assembler, V2.0
Libraries: SYSTEM.LIB
Media Availability (Price Code): DISKETTE (C), SRC, OBJ; SOURCE LISTING (L); DOCUMENTATION

AA18, MONITOR: iSBC-80/24

Submitted by: Tom Dale, Intel Corporation

Abstract: This program runs on the iSBC-80/24 board and is designed to provide the user with a minimal monitor. By using the program, the user can examine and change memory or CPU registers, load a program (in ABSOLUTE HEX) into RAM, and execute instructions already in memory. The monitor also provides the user with routines for performing console I/O and paper tape I/O. The 80/24 monitor can reside in one 2716 PROM.

Hardware Required: iSBC-80/24, PROM programming capabilities
Software Required: None
Registers Modified: All. **Required:** RAM/98 bytes; ROM/2080 bytes; BLOCKS 675
Programming Language: Assembly. **Assembler/Compiler:** 8080/8085 Macro Assembler, V4.0
Media Availability (Price Code): DISKETTE (D), SRC, OBJ; SOURCE LISTING (L)

AA19, MONITOR: iSBC 80/30

Submitted by: c/o Intel Corporation

Abstract: This program runs on the iSBC 80/30 board and is designed to provide the user with a minimal monitor, with which the user can examine and change memory or CPU registers, load a program (in absolute hex) into RAM, and execute instructions already in memory. The monitor also provides the user with routines for performing console I/O and paper tape I/O. The 80/30 monitor can reside in one 2716 PROM.

Hardware Required: PROM programming capabilities; iSBC 80/30
Software Required: N/A
Registers Modified: All. **Required:** RAM/96 bytes; ROM/2040 bytes; BLOCKS/662
Programming Language: Assembly. **Assembler/Compiler:** 8080/8085 Macro Assembler, V3.0
Libraries: SYSTEM.LIB
Media Availability (Price Code): DISKETTE (B), SRC, OBJ: SOURCE LISTING (L); DOCUMENTATION

AA20, MONITOR: SUPER MONITOR 80

Submitted by: David Jurasek, Intel Corporation

Abstract: This monitor is a super set of earlier 80/10, 80/20, 80/30, and iSBC 544 monitors. Additional features include: UPLOAD/DOWNLOAD, error logging, disassembler, user selectable system test, RAM re- read on RAM test, in-line assembler. The monitor is intended to be used with a Hazeltine 1510 terminal or equivalent and may be interfaced to Intellec Series-II, Series-III, or MDS-800 Development Systems.

Hardware Required: iSBC 80/10/10B/20/30/544
Software Required: None
Registers Modified: All. **Required:** RAM/4K; ROM/8K maximum; BLOCKS/1817
Programming Language: ASM-80. **Assembler/Compiler:** 8080/8085 Macro Assembler, V2.0
Media Availability (Price Code): DISKETTE (D), SRC, OBJ, ABS.OBJ; DOCUMENTATION

AA21, MONITOR: SUPER MONITOR 86

Submitted by: Scott Tetrick, Intel Corp., with additions by David Jurasek, Intel Corp.

Abstract: Super Monitor 86 is a diagnostic monitor for hardware products using the 8086 family processor. It is designed to allow quick and thorough debug of major hardware functions. Super Monitor 86 is the successor of the iSBC monitors and attempts to maintain compatibility in command structures and testing methods. The monitor can be interfaced to Intellec Series-II, Series-III, or MDS-800 Development Systems.

Hardware Required: iSBC 86/05/12/12A/14/30; CRT (preferably Hazeltine 1510); RS232 cabling.
Software Required: None
Registers Modified: None. **Required:** RAM/2K bytes; ROM/8K bytes; BLOCKS/3240
Programming Language: ASM-86. **Assembler/Compiler:** MCS-86 Assembler
Libraries: LIB86
Media Availability (Price Code): DISKETTE (H), SRC, OBJ, ABS.OBJ; DOCUMENTATION

AA22, MONITOR: SUPER MONITOR 86 for the iSBC 88/45

Submitted by: Richard Haslam, Intel Corporation

Abstract: This program provides a monitor and test suite to exercise the onboard I/O devices of the iSBC 88/45. It must be programmed from hex files into three 2764 EPROMs. The monitor will support an iSBX 351 on either of the 88/45's iSBX connectors or else will default to an iSBC 116A card for its serial port

Hardware Required: iSBC 88/45; iSBX 351 or iSBC 116A; EPROM programmer and three 2764 EPROMs; RS232 and RS422 loopback connectors.
Software Required: None to execute, PL/M 86, ASM86, LINK86, LOC86, OH86 to modify.
Required: RAM/16K; ROM/24K; BLOCKS/3366
Programming Language: PL/M-86, ASM86. **Assembler/Compiler:** PL/M-86, V2.0; 8086/87/88 Macro Assembler R215
Media Availability (Price Code): DISKETTE (F), SRC, OBJ, HEX; DOCUMENTATION

PERIPHERAL DRIVERS

AB1, DRIVER: 8085 SERIAL I/O

Submitted by: John Wharton, Intel Corporation

Abstract: This software package contains subroutines performing: -Interface of 8085 to CRT; -Utilities for recording and reloading an audio cassette recorder.

Hardware Required: 8085 CPU; CRT; cassette tape unit; 5V power supply
Software Required: None
Registers Modified: All. **Required:** RAM/4 bytes + stack; ROM/326 bytes; BLOCKS/78
Programming Language: Assembly. **Assembler/Compiler:** 8080/8085 Macro Assembler, V3.0
Libraries: SYSTEM.LIB
Media Availability (Price Code): DISKETTE (B), SRC, OBJ; PAPER TAPE (P), SRC; SOURCE LISTING (L); DOCUMENTATION

AB2, CONTROLLER: PROMPT-48™ INTERACTIVE

Submitted by: Peter Glasmacher, Ingenie. Glasmacher, Munchen, West Germany

Abstract: This program provides remote interactive control of Prompt-48 using an Intellec and CRT.

Hardware Required: Intellec 8080-based; Prompt-48
Software Required: ISIS-II; Insite Program Order No. AD3
Registers Modified: All. **Required:** RAM/32K; ROM/None; BLOCKS/116
Programming Language: PL/M. **Assembler/Compiler:** PL/M-80
Libraries: SYSTEM.LIB, PLM80.LIB
Media Availability (Price Code): DISKETTE (A), SRC, OBJ; PAPER TAPE (P), SRC; SOURCE LISTING (L); DOCUMENTATION

AB3, DRIVER: TEKTRONIX 4010 GRAPHIC SCREEN

Submitted by: Henning Nielsen, Institute for Elektroniske Systemer, Aalborg, Denmark

Abstract: This program is a set of PL/M procedures for controlling a Tektronix 4010 Graphic Screen as the output device on an 8080 system.

Hardware Required: Intellec 8080-based; Tektronix 4010 Graphic Screen
Software Required: Intellec System Monitor
Registers Modified: All. **Required:** RAM/0.75K; BLOCKS/44
Programming Language: PL/M. **Assembler/Compiler:** PL/M-80, V3.0
Libraries: SYSTEM.LIB, PLM80.LIB
Media Availability (Price Code): DISKETTE (A), SRC, OBJ; PAPER TAPE (P), SRC; SOURCE LISTING (L); DOCUMENTATION

AB4, DRIVER: T.I. OMNI 810 LINEPRINTER

Submitted by: Kevin King, Compugraphic, Wilmington, Massachusetts

Abstract: This program initializes baud rate and USARTs in an MDS-230, defines a Texas Instruments Omni 810 lineprinter as a valid ISIS device, and sets up tabs in the printer.

Hardware Required: MDS-230; T.I. Omni 810 printer with RS232 interface; interface cable
Software Required: ISIS-II
Registers Modified: None. **Required:** RAM/15 bytes; ROM/None; BLOCKS/109
Programming Language: ASM-80. **Assembler/Compiler:** 8080/8085 Macro Assembler, V4.0
Libraries: SYSTEM.LIB
Media Availability (Price Code): DISKETTE (A), SRC, OBJ, ABS.OBJ; PAPER TAPE (P), SRC; SOURCE LISTING (L); DOCUMENTATION

AB5, DRIVER: 8048 SEVEN-SEGMENT DISPLAY

Submitted by: J. Wharton, Intel Corporation

Abstract: This driver package is a collection of utility subroutines which may be used with the 8048 family to: 1) Scan keyboard matrix; 2) Debounce and encode key depressions; 3) Drive a multiplexed 7-segment display. The code is written so that various hardware configurations can be accommodated by redefining the initial variables.

Hardware Required: Intellec 8048-based; X-Y matrix to 64 switches; 7-segment display.
Software Required: ISIS-II
Registers Modified: Pointers and one in blank 0 and four in blank 1
Required: RAM/12 bytes; ROM/250 bytes; BLOCKS/223
Programming Language: Assembly. **Assembler/Compiler:** MCS-48/UPI-41 Macro Assembler, V2.0
Media Availability (Price Code): DISKETTE (B), SRC, HEX; PAPER TAPE (P), SRC; SOURCE LISTING (L); DOCUMENTATION

AB6, DRIVER: AUDIO CASSETTE RECORDER

Submitted by: Guenter Ruschitzka, Zuzenhausen, West Germany

Abstract: This routine outputs RAM data to an audio cassette recorder paralleled to a CRT terminal. Data can be read back using the monitor's I-command.

Hardware Required: SDK-80 or other 8080 computer; CRT; audio cassette recorder
Software Required: SDK-80 Monitor
Required: RAM/70 bytes; ROM/none; BLOCKS/21
Programming Language: Assembly. **Assembler/Compiler:** 8080/8085 Macro Assembler, V3.0
Libraries: SYSTEM.LIB
Media Availability (Price Code): DISKETTE (A), SRC, OBJ; PAPER TAPE (P), SRC; SOURCE LISTING (L); DOCUMENTATION

AB7, DRIVER: CASSETTE OPERATING SYSTEM

Submitted by: Robert A. McCormick, Frye Electronics Inc., Tigard, OR

Abstract: This program provides practical substitution of a cassette storage for a paper tape device. Cassette storage is buffer-oriented.

Hardware Required: Intellec 800; audio cassette recorder with I/O
Software Required: Intellec System Monitor, V2.0
Registers Modified: All. **Required:** RAM/0.75 bytes; ROM/1.25 bytes; BLOCKS/107
Programming Language: Assembly. **Assembler/Compiler:** 8080/8085 Macro Assembler, V3.0
Libraries: SYSTEM.LIB
Media Availability (Price Code): DISKETTE (B), SRC, OBJ; PAPER TAPE (P), SRC; SOURCE LISTING (L); DOCUMENTATION

AB8, DRIVER: SYCOR 135 CASSETTE OPERATING SYSTEM

Abstract: This program provides all functions to create a cassette operating system of the Sycor 135 type (other tape units can be used). The following commands are available: -Format a tape; -List directory on CRT; -Record a file; -Read a file; -Delete a file; -Rewind on leader.

Hardware Required: Intellec System, 8080-based; 8-bit output port, 4-bit input port (8255); serial transmitter/receiver (8251); timer (8253); cassette tape unit (Sycor 135 or other)
Software Required: Monitor
Registers Modified: All. **Required:** RAM/20 bytes + data files; ROM/1593 bytes; BLOCKS/998
Programming Language: Assembly. **Assembler/Compiler:** 8080/8085 Macro Assembler, V3.0
Libraries: SYSTEM.LIB
Media Availability (Price Code): DISKETTE (A), SRC, OBJ; PAPER TAPE (P), SRC; SOURCE LISTING (L); DOCUMENTATION

AB9, DRIVER: INTELLEC DEVELOPMENT SYSTEM SERIES-II AS DUMB TERMINAL

Submitted by: Dave Mabry, Chrysler Corporation, Detroit, MI

Abstract: This program allows the Intellec Series-II keyboard/CRT to be used as a "dumb" terminal.

Hardware Required: Intellec Series-II
Software Required: ISIS-II
Registers Modified: A, C, D, E, SP, H, L. **Required:** RAM/128 bytes; ROM/none; BLOCKS/33
Programming Language: Assembly. **Assembler/Compiler:** 8080/8085 Macro Assembler, V3.0
Libraries: SYSTEM.LIB
Media Availability (Price Code): DISKETTE (C), SRC, OBJ; PAPER TAPE (P), SRC; SOURCE LISTING (L); DOCUMENTATION

AB10, DRIVER: DUMB TERMINAL SIMULATOR

Submitted by: Sam Smity, Rothe Development, San Antonio, TX

Abstract: This program allows users of Intellec Models 220 and 230 to use them as "dumb" terminals for connection to a modem or another computer. The dumb terminal I/O is through serial connector 1 (TTY) to allow operation in either current loop or RS232 interface modes. Good for use with a modem and dial-up timesharing service.

Hardware Required: Intellec 220 or 230
Software Required: ISIS-II, Series II Monitor
Registers Modified: All. **Required:** RAM/2K; ROM/Series II Monitor; BLOCKS/104
Programming Language: Assembly. **Assembler/Compiler:** 8080/8085 Macro Assembler, V3.0
Libraries: SYSTEM.LIB
Media Availability (Price Code): DISKETTE (B), SRC, OBJ, ABS.OBJ; SOURCE LISTING (L); DOCUMENTATION

AB11, CONTROLLER: DUAL FLOPPY DISK DRIVE

Abstract: This program allows the user to read and write a 200 (octal) word block to and from a user-specified buffer onto the desired track and sector.

Hardware Required: 8080, floppy disk
Software Required: None
Registers Modified: A, only if in error. **Required:** RAM/191 bytes + stack; ROM/1230Q bytes; BLOCKS/290
Programming Language: Assembly. **Assembler/Compiler:** 8080/8085 Macro Assembler, V3.0
Libraries: SYSTEM.LIB
Media Availability (Price Code): DISKETTE (B), SRC, OBJ; SOURCE LISTING (L)

AB12, DRIVER: RMX 80 FOR iSBC 534

Submitted by: Joe Barthmaier and Steve Verleye, Intel Corporation

Abstract: This program is a driver for the iSBC 534 Communications Expansion Board utilizing RMX 80.

Hardware Requred: ISBC 80/10, 80/10A, 80/20, or 80/20-4; iSBC 534
Software Required: RMX 80
Registers Modified: All. **Required:** RAM/256; ROM/1555; BLOCKS/438
Programming Language: PL/M. **Assembler/Compiler:** ISIS-II PL/M-80, V3.1
Media Availability (Price Code): DISKETTE (A), SRC, OBJ; PAPER TAPE (P), SRC; SOURCE LISTING (L); DOCUMENTATION

AB13, DRIVER: RMX 80, FOR SBC-215 CONTROLLER BOARD

Submitted by: Larry Telle, Xerox Corporation, Webster, NY

Abstract: This program interfaces the SBC-215 Winchester Controller to RMX-80. Files may be created, deleted and changed; data may be accessed sequentially and randomly. The user is given the flexibility to configure various complements of Intel disk drives and controllers.

Hardware Required: SBC-215, Shugart SA-1004, 10 megabytes Winchester disk drive, Shugart SA-1200 data separator, harnesses, Multibus System

Software Required: RMX-80, V1.4

Registers Modified: All. **Required:** RAM/64 bytes + DFS; ROM/2500 bytes + DFS; BLOCKS/2947

Programming Language: Assembly, PL/M-80. **Assembler/Compiler:** 8080/8085 Macro Assembler, V4.0, PL/M-80, V3.1

Media Availability (Price Code): DISKETTE (D), SRC, OBJ; DOCUMENTATION

AB14, DRIVER: RMX 80, FOR THE iSBC 254 BUBBLE MEMORY WITH 80/10 BOARD

Submitted by: Lenore Kirvay, Intel Corporation

Abstract: This is a set of two programs to run under RMX 80. The Bubble Memory I/O program controls the iSBC 254 bubble memory board for data storage and retrieval. The Bubble Memory Manager program allocates and de-allocates bubble memory pages on the iSBC 254 board.

Hardware Required: iSBC 254; iSBC 80/10; bus-addressable memory; cardcage

Software Required: RMX 80 nucleus, BUBIO, BMGR (this program), configured information about iSBC 254 (such as base address, buffer location, etc.). See documentation.

Required: BLOCKS/1208

Programming Language: PL/M. **Assembler/Compiler:** PL/M-80, V3.0

Libraries: SYSTEM.LIB, PLM80.LIB

Media Availability (Price Code): DISKETTE (D), SRC, OBJ, LST; DOCUMENTATION

AB15, DRIVERS: RMX 80, FOR THE iSBC 254 BUBBLE MEMORY WITH 80/20/30 BOARD

Submitted by: Lenore Kirvay, Intel Corporation

Abstract: This is a set of two programs to run under RMX 80. The Bubble Memory I/O program controls the iSBC 254 bubble memory board for data storage and retrieval. The Bubble Manager program allocates and de-allocates bubble memory pages on the iSBC 254 board.

Hardware Required: iSBC 254; iSBC 80/20 or iSBC 80/30; bus-addressable memory; cardcage

Software Required: RMX 80 nucleus, BUBIO, BMGR (this program), configured information about iSBC 254 (such as base address, buffer location, etc.). See documentation.

Required: BLOCKS/1207

Programming Language: PL/M. **Assembler/Compiler:** PL/M-80, V3.0

Libraries: SYSTEM.LIB, PLM80.LIB

Media Availability (Price Code): DISKETTE (D), SRC, OBJ, LIST; DOCUMENTATION

AB16, DRIVER: RMX 86, FOR THE iSBC 254 BUBBLE MEMORY BOARD

Submitted by: Lenore Kirvay, Intel Corporation

Abstract: This program is an iSBC 254 random-access driver supporting the following functions: F$READ, F$WRITE, F$SEEK, F$ATTACH$DEVICE, F$DETACH$DEVICE, F$OPEN, and F$CLOSE.

Hardware Required: iSBC 254 board, 86/12 board

Software Required: RMX 86 and its I/O system, configured with these programs as the iSBC 254 driver.

Required: BLOCKS/1256

Programming Language: PL/M. **Assembler/Compiler:** PL/M-86, V2.1

Libraries: SYSTEM.LIB, PLM86.LIB

Media Availability (Price Code): DISKETTE (C), SRC, OBJ, LST; DOCUMENTATION

AB17, DRIVER: RMX-86, FOR THE iPAB-128, iPAB-256, iSBX-251 BUBBLE MEMORY PRODUCTS

Submitted by: J. Wolfeld, Intel Corporation

Abstract: This program allows the iPAB-128/iPAB-256/iSBX-251 bubble memory products to be standard random access devices under iRMX-86 release 4.0. On each interrupt level, the driver can support one iSBX-251 Multimodule board, or up to eight iPAB-128 units and/or iPAB-256 units, with related hardware.

Hardware Required: 8086/88-based system with iSBX connector; iSBX-251 Bubble Memory Multimodule or Intel Plug-A-Bubble System.
Software Required: iRMX-86 Operating System, release 4.0
Registers Modified: None. **Required:** BLOCKS/2287
Programming Language: PL/M-86, ASM-86. **Assembler/Compiler:** PL/M-86, V2.0; ASM-86, V3.0
Libraries: PLM86.LIB
Media Availability (Price Code): DISKETTE (H), SRC, OBJ, LST; SOURCE LISTING (L); DOCUMENTATION

AB18, DRIVER: RMX-86, HIGH PERFORMANCE DRIVER FOR iSBC-550 ETHERNET COMMUNICATIONS CONTROLLER

Submitted by: Narjala Bhasker, Intel Corporation

Abstract: This driver provides a simple mailbox-based interface to the iSBC-550 Ethernet Controller. External Data Link messages are accepted from a client layer at a mailbox and transmitted to the iSBC-550 board, and EDL messages from the board are passed back via a mailbox to the client layer. The program uses a simplified Multibus Interprocessor Protocol implementation to minimize overhead.

Hardware Required: Host system capable of running iRMX-86 nucleus and terminal handler; iSBC-550 Ethernet Communications Controller.
Software Required: iRMX-86 Rel. 5; iRMX-86 Terminal Handler Rel. 5; 8086 Utilities V2.0
Required: RAM/Approx. 6K; BLOCKS/2859
Programming Language: PL/M-86. **Assembler/Compiler:** PL/M-86, V2.0
Libraries: RPIFC.LIB
Media Availability (Price Code): DISKETTE (H), SRC, OBJ, ABS.OBJ, LST; SOURCE LISTING (L); DOCUMENTATION

AB19, DRIVER: iSBC-86/12 REAL TIME CLOCK DRIVER

Submitted by: Michael Finch, Micro-Comm System, Inc., Augoura, CA

Abstract: This is an interrupt drive clock driver that increments a 32-bit system variable each interrupt and calls an external routine every tenth interrupt. The initialization sequence is included to set up the on-board 8253 timer chip to create interrupts at 100 ms intervals, thus creating a 1-second real time clock.

Hardware Required: Intel iSBC-86/12 card
Software Required: None
Registers Modified: None
Programming Language: 8086 Assembly Language. **Assembler/Compiler:** MCS-86 Assembler
Media Availability (Price Code): DISKETTE (A), SRC, OBJ; PAPER TAPE (P), SRC; SOURCE LISTING (L) DOCUMENTATION

AB20, CONTROLLER: PID CONTROL LOOPS (SOFTWARE FOR AP-114)

Submitted by: Pete Andersen, Intel Corporation

Abstract: This program provides 1 to 8 Proportional, Integral, and Derivative (PID) control loops using the iSBC-88/40 Measurement and Control Computer. The software functions as a task set under the iRMX 88 Real Time Executive. Each PID loop requires only 5 msec.

Hardware Required: iSBC-88/40 Measurement and Control Computer, iSBC-337 Multimodule Numeric Data Processor, iSBC 328 Multimodule Analog output board
Software Required: iRMX 88 Real Time Executive
Registers Modified: All. **Required:** RAM/5562 + iRMX 88 Nucleus; ROM/9360 + iRMX 88 Nucleus; BLOCKS:/1206
Programming Language: PL/M-86. **Assembler/Compiler:** PL/M-86, V1.2
Libraries: TH088.LIB, TH188.LIB, RMXMAX.LIB, 8087.LIB
Media Availability (Price Code): DISKETTE (C), SRC, OBJ; SOURCE LISTING (L); DOCUMENTATION

AB21, DRIVER: USART FOR iSBC-86/XX

Submitted by: Steve Cooper, Intel Corporation

Abstract: This program provides run-time support for terminal input and output via the USART on an iSBC 86/05, 86/12A, 86/14, 86/30, or 88/25. This run-time support is used in conjunction with Pascal-86 or FORTRAN-86.

Hardware Required: Development System, ICE-86, ICE-88, or iSBC-957B for downloading, target system including an iSBC-86/05, 86/12A, 86/14, 86/30 or 88/25 board.
Software Required: LINK, LOCATE, iSBC-957B
Registers Modified: None. **Required:** RAM/68D; ROM/657D; BLOCKS/108
Programming Language: PL/M. **Assembler/Compiler:** PL/M-86, V2.0
Media Availability (Price Code): DISKETTE (C), SRC, OBJ; PAPER TAPE (P); SOURCE LISTING (L); DOCUMENTATION

AB22, DRIVER: BIOS AND BOOT PROGRAM FOR CP/M-80

Submitted by: Jim Grier, Harvey Electronics, Woodbury, NY

Abstract: This program provides a BIOS to run CP/M-80 V2.2 in the iSBC-80/24 environment. BIOS and BOOT files are burned into EPROM on the 80/24. On reset, the BOOT copies the BIOS from EPROM into upper RAM and jumps to the cold start routine in the BIOS, thus booting up CP/M. Disk formatting and track-by-track copying utilities are also supplied.

Hardware Required: iSBC-80/24 strapped to 4.84 mhz operation. iSBX-218 strapped for NON-DMA operation, SBC-064, cardcage, power supply, single or double density disk drives, RS232 monitor.
Software Required: Single or double density CP/M system diskette
Required: RAM/64K bytes; ROM/4K bytes, 2-2716's; BLOCKS/518
Programming Language: Assembly. **Assembler/Compiler:** 8080/8085 Macro Assembler, V4.0
Media Availability (Price Code): DISKETTE (H), SRC, OBJ; DOCUMENTATION (EXTENSIVE, INCLUDES SOURCE LISTING)

AB23, DRIVER: iPDS AS DUMB TERMINAL

Submitted by: Matthew Legrand, Intel Corporation

Abstract: This program allows the iPDS to function as a dumb terminal, communicating through its serial port in half or full duplex mode.

Hardware Required: iPDS; 3-wire RS232-compatible cable; host device with serial I/O port
Software Required: ISIS-PDS Operating System, including program SERIAL
Required: RAM/1274; ROM/8 blocks, 906 bytes; BLOCKS/98
Programming Language: PL/M-80. Assembler/Compiler: PL/M-80, V4.0
Libraries: SYSPDS.LIB, PLM80.LIB
Media Availability (Price Code): DISKETTE (F), SRC, OBJ, LST, ABS.OBJ; SOURCE LISTING (L)

SLAVE PROCESSORS

AC1, CONTROLLER: UPI-41 8-DIGIT LED DISPLAY

Submitted by: Robin Jigour, Intel Corporation

Abstract: This program uses the UPI-41 as an LED display controller which scans and refreshes 8 multiplexed, 7-segment LED displays. Characters are defined by input from the master microprocessor. Thirty two alphanumeric characters are available for display. Applications: clock or temperature readout, message display, etc.

Hardware Required: UPI-41; 8085 CPU; LEDs
Software Required: UPI-41
Registers Modified: A, RB1, R0, R2, R3, R7 (within UPI-41). **Required:** RAM/14 bytes (within UPI-41); ROM/115 bytes (within UPI-41); BLOCKS/83
Programming Language: Assembly. **Assembler/Compiler:** MCS-48/UPI-41 Macro Assembler, V2.0
Media Availability (Price Code): DISKETTE (A), SRC, HEX; PAPER TAPE (P), SRC; SOURCE LISTING (L); DOCUMENTATION

AC2, DEVICE, I/O: UPI-41A COMBINATION

Submitted by: John Beaston, Intel Corporation

Abstract: This program uses the UPI-41A as a combination serial and parallel I/O device. Serial: Full duplex asynchronous with programmable baud rate and transmitter and receiver, double-buffered receiver, and checks for framing and overrrun errors.

Hardware Required: Intellec System; UPI-41A
Software Required: ISIS-II; UPI-41A
Required: RAM/12 bytes; ROM/363 bytes; BLOCKS/158
Programming Language: Assembly. **Assembler/Compiler:** MCS-48/UPI-41 Macro Assembler, V2.0
Media Availability (Price Code): DISKETTE (C), SRC, HEX; PAPER TAPE (P), SRC; SOURCE LISTING (L); DOCUMENTATION

AC3, CONTROLLER: 8278 KEYBOARD/DISPLAY

Submitted by: John Beaston, Intel Corporation

Abstract: This program is the source code for the UPI-41A-based 8278 Keyboard/Display Controller. Features of the 8278 are: -128-key scanning logic; -16-digit LED display multiplexing; -Interface for either contact or capacitively-coupled keyboards; -N-Key rollover; -8-character keyboard FIFO; -Right or left entry display.

Hardware Required: Intellec System; UPI-41A
Software Required: ISIS-II; UPI-41A
Required: RAM/64 bytes; ROM/965 bytes; BLOCKS/141
Programming Language: Assembly. **Assembler/Compiler:** MCS-48/UPI-41 Macro Assembler, V2.0
Media Availability (Price Code): DISKETTE (C), SRC, HEX; PAPER TAPE (P), SRC; SOURCE LISTING (L); DOCUMENTATION

AC4, CONTROLLER: 8292 ON 8741A

Submitted by: T. Voll, Intel Corporation

Abstract: This program implements the IEEE-488 control function (8292 GPIB controller) on the 8741A.

Hardware Required: Intellec System; 8741A
Software Required: ISIS-II
Required: ROM/1K bytes; BLOCKS/277
Programming Language: Assembly. **Assembler/Compiler:** MCS-48/UPI-41 Macro Assembler, V3.0
Media Availability (Price Code): DISKETTE (B), SRC, HEX; PAPER TAPE (P), SRC; SOURCE LISTING (L); DOCUMENTATION

AC5, CONTROLLER: UPI-41A/42 DIGITAL CASSETTE, V2.5

Submitted by: James Kahn, Intel Corporation

Abstract: This program uses the UPI-41A or UPI-42 as a digital cassette controller for the Braemer CM-600 cassette transport. Available commands include: -Read a block; -Write a block; -Seek a block; -Rewind; -Unit select (allows controller to support up to four CM-600 transports); -Modify parameters (to handle different drive or format requirements); -Reset.

Hardware Required: Intellec System; UPI-41A/42; Braemer CM-600; PROM programming capabilities
Software Required: ISIS-II
Required: RAM/64 bytes; ROM/1024 bytes; BLOCKS/251
Programming Language: ASM-80. **Assembler/Compiler:** MCS-48/UPI-41 Macro Assembler, V4.2
Media Availability (Price Code): DISKETTE (B), SRC, HEX; SOURCE LISTING (L); DOCUMENTATION

AC6, PROGRAM: 8741A AS iSBC 941

Submitted by: Brian Addington, Intel Corporation

Abstract: This program allows the user to program an 8741A so that it is the iSBC 941 Industrial Digital Processor.

Hardware Required: Intel MDS 800 or Series II or III; floppy disk drives :F0: and :F1:; UPP 833 Universal Prom Programmer with UPP 848 personality module and adapter; erased 8741A
Software Required: ISIS system files, including FPAL.LIB; UPM
Required: RAM/64K; ROM/system monitor; BLOCKS/1185
Programming Language: ASM-48. **Assembler/Compiler:** MCS-48/UPI-41 Macro Assembler, V3.0
Libraries: SYSTEM.LIB, PLM80.LIB, FPAL.LIB
Media Availability (Price Code): DISKETTE (E), SRC, OBJ, HEX; SOURCE LISTING (L); DOCUMENTATION

AC7, CONTROLLER: FIRMWARE FOR iSBC-589

Submitted by: Phil Drain, Intel Corporation

Abstract: This is the resident firmware for the iSBC-589 Intelligent DMA Controller Board. Included are the iSBC-589 memory map code, the iSBC-589 Multichannel Slave Code, the iSBC-589 'Master' code, a Submit file to assemble, link, and locate, and List files. The located firmware may be put into two 2732A EPROMs.

Hardware Required: iSBC-589 Intelligent DMA Controller Board
Software Required: 8089 Assembler
Required: ROM/8K; BLOCKS/3757
Programming Language: ASM-890. **Assembler/Compiler:** ISIS-II 8089 Assembler X004
Media Availability (Price Code): DISKETTE (L); SRC, LST, ABS.OBJ

SYSTEM COMMUNICATIONS

AD1, COMMUNICATION: HEWLETT-PACKARD CALCULATOR WITH INTELLEC DEVELOPMENT SYSTEM 800

Submitted by: John E. Kiesling, Quality Measurement Systems, Penfield, NY

Abstract: This program inputs and outputs data and instructions between the HP9815 programmable calculator and the Intellec 800 memory.

Hardware Required: Intellec 800; Hewlett-Packard 9815 Calculator
Software Required: Monitor
Registers Modified: A, C, D, E, H, L. **Required:** RAM/100D + data storage; BLOCKs/34
Programming Language: Assembly. **Assembler/Compiler:** 8080/8085 Macro Assembler, V2.0
Libraries: SYSTEM.LIB
Media Availability (Price Code): DISKETTE (A), SRC, OBJ; PAPER TAPE (P), SRC; SOURCE LISTING (L)

AD2, COMMUNICATION: INTELLEC DEVELOPMENT SYSTEM SERIES-II WITH PROMPT-48

Submitted by: P. Bushell, MicroGenics, Bourne End, England

Abstract: This program downloads an MCS-48 program from a hex file to the Prompt-48, using serial channel 2 on a Series II development system.

Hardware Required: Intellec Series-II; Prompt-48; male-to-male RS232 cable; diskette operating system
Software Required: ISIS-II; Prompt-48 Monitor
Registers Modified: All. **Required:** RAM/1206H bytes, including a 4K buffer; BLOCKS/49
Programming Language: PL/M. **Assembler/Compiler:** PL/M-80, V3.1
Libraries: SYSTEM.LIB, PLM80.LIB
Media Availability (Price Code): DISKETTE (B), SRC, OBJ, ABS.OBJ; PAPER TAPE (P), SRC; SOURCE LISTING (L); DOCUMENTATION

AD3, COMMUNICATION: INTELLEC DEVELOPMENT SYSTEM TO PROMPT-48 OR PROMPT-80

Submitted by: Peter Glasmacher, Munchen 45, West Germany

Abstract: This routine sends/receives 1 byte from the Intellec system to the Prompt-48 or Prompt-80 via Prompt-SPP cable.

Hardware Required: Intellec System, 8080-based; Prompt-48 pr Prompt-80; Prompt SPP cable
Software Required: ISIS-II
Registers Modified: A, B, C, D, E. **Required:** RAM/none; ROM/98 bytes; BLOCKS/31
Programming Language: Assembly. **Assembler/Compiler:** 8080/8085 Macro Assembler, V3.0
Libraries: SYSTEM.LIB
Media Availability (Price Code): DISKETTE (A), SRC, OBJ; PAPER TAPE (P), SRC; SOURCE LISTING (L)

AD4, COMMUNICATION: INTELLEC DEVELOPMENT SYSTEM 220/230 WITH SDK-85, V1.0

Submitted by: Max Jensen, Denmark

Abstract: This program loads an object-file from an Intellec 220/230 to the SDK-85 through the serial TTY port on the system via the SDK's TTY monitor.

Hardware Required: Intellec220/230; SDK-85; interconnecting cables; opto couplers
Software Required: ISIS-II
Registers Modified: All. **Required:** RAM/32-64K; ROM/monitor; BLOCKS/208
Programming Language: Assembly. **Assembler/Compiler:** 8080/8085 Macro Assembler, V3.0
Libraries: SYSTEM.LIB
Media Availability (Price Code): DISKETTE (B), SRC, OBJ; PAPER TAPE (P), SRC; SOURCE LISTING (L), DOCUMENTATION

AD5, RECEIVE

Submitted by: Dave Mabry, Chrysler Corporation, Detroit, MI

Abstract: This program allows data to be received through serial port #2 on a Series-II Development System and written to a file. Uses entire "Memory" block available as input buffer.

Hardware Required: Intellec Series-II Models 22X, 23X, 24X
Software Required: ISIS-II; ASM-80; "Dumb" terminal program (Insite Order No. AB9) or equivalent
Registers Modified: All. **Required:** RAM: 304 + buffer; ROM/None; BLOCKS/57
Programming Language: ASM-80. **Assembler/Compiler:** 8080/8085 Macro Assembler, V4.0
Media Availability (Price Code): DISKETTE (B), SRC, OBJ; PAPER TAPE (P), SRC; SOURCE LISTING (L); DOCUMENTATION

AD6, COMMUNICATION: INTELLEC MODEL 220/230 TO TIMESHARING COMPUTER

Submitted by: Dave Mabry, Chrysler Corporation, Detroit, MI

Abstract: This program reads ISIS-II file and sends it out Serial Port #2. Channel #2 can talk to a modem or acoustic coupler, so this program can be used to load a file from the Intellec 220/230 to a timesharing computer.

Hardware Required: Intellec Model 220/230
Software Required: ISIS-II
Registers Modified: All. **Required:** RAM/255 bytes minimum, 512 bytes nominal; ROM/none; BLOCKS/55
Programming Language: Assembly. **Assembler/Compiler:** 8080/8085 Macro Assembler, V3.0
Libraries: SYSTEM.LIB
Media Availability (Price Code): DISKETTE (C), SRC, OBJ; PAPER TAPE (P), SRC; SOURCE LISTING (L); DOCUMENTATION

AD7, COMMUNICATION: TWO INTELLEC SERIES-II DEVELOPMENT SYSTEMS

Submitted by: Herb Chin, Intel Corporation

Abstract: This program provides for Intellec communications/file passing between two Series-IIs via modems and telephone lines.

Hardware Required: Intellec Series-II; acoustic coupler; CRT cable (P/N 4000417)
Software Required: ISIS-II
Programming Language: PL/M. **Assembler/Compiler:** PL/M-80, V3.1
Libraries: SYSTEM.LIB, PLM80.LIB
Media Availability (Price Code): DISKETTE (E), SRC, OBJ, LST, ABS.OBJ; DOCUMENTATION

AD8, COMMUNICATION: INTELLEC MODEL 800 TO/FROM DEC PDP-10

Submitted by: c/o Intel Corporation

Abstract: This program provides three functions to use the Intellec 800 as a terminal or to transfer files to/from a DEC PDP-10: -ONLINE; -UPLOAD; -DOWNLOAD.

Hardware Required: Intellec 800; PDP-10 serial port; RS232
Software Required: ISIS-II; driver on host computer
Registers Modified: All. **Required:** BLOCKS/426
Programming Language: Assembly, PL/M. **Assembler/Compiler:** 8080/8085 Macro Assembler, V3.0; PL/M-80 Compiler
Libraries: SYSTEM.LIB, PLM80.LIB
Media Availability (Price Code): DISKETTE (C), SRC, OBJ; PAPER TAPE (P), SRC; SOURCE LISTING (L); DOCUMENTATION

AD9, COMMUNICATION: INTELLEC DEVELOPMENT SYSTEM SERIES-II WITH MINICOMPUTER

Submitted by: c/o Intel Corporation

Abstract: This program uploads and downloads files between Series-II and a host computer. It makes the Intellec Series-II emulate a CRT for use on minicomputer systems.

Hardware Required: Intellec System 220/230/240; host computer
Software Required: ISIS-II
Registers Modified: All. **Required:** RAM/32K minimum, 64K preferred; ROM/none; BLOCKS/3391
Programming Language: PL/M-80. **Assembler/Compiler:** PL/M-80, V3.1
Libraries: SYSTEM.LIB, PLM80.LIB
Media Availability (Price Code): DISKETTE (F), SRC, OBJ, ABS, OBJ; DOCUMENTATION

AD10, COMMUNICATION: INTELLEC DEVELOPMENT SYSTEM TO/FROM DEC

Submitted by: D. Pfaltzgraff, Frederick Electronics Corporation, Frederick, MD

Abstract: This program allows the MDS-800 or MDS-230 to act as a dumb terminal to a timesharing line. The program conforms to the DEC RSTS/E PIPEXT utility, and can be easily modified to support other systems.

Hardware Required: MDS-230 TTY PORT 0, MDS-800 TTY Port, timesharing system, current loop interface
Software Required: ISIS-II and ROM monitor. PL/M-80, LINK, LOCATE
Registers Modified: All. **Required:** RAM/All available used; ROM/None; BLOCK/458
Programming Language: PL/M-80. **Assembler/Compiler:** PL/M-80, V4.0
Libraries: SYSTEM.LIB, PLM80.LIB
Media Availability (Price Code): DISKETTE (D), SRC, ABS.OBJ; SOURCE LISTING (L); DOCUMENTATION

AD11, COMMUNICATION: INTELLEC DEVELOPMENT SYSTEM TO/FROM TEKTRONIX 8001

Submitted by: D. Higgins and T. Ward, Lanier Business Products R&D, Atlanta, GA

Abstract: This program has two routines that may be used to communicate between an Intellec and a Tektronix 8001 emulator station. HEXTHX converts a file from Intel HEX format to Tektronix HEX format. TEKCOM handles uploading and downloading between the Intellec and the Tektronix 8001.

Hardware Required: Intellec Series-II; Diskette Operating System; Tektronix 8001 Emulator Station; null-modem cable
Software Required: ISIS-II
Registers Modified: All. **Required:** RAM/64K; BLOCKS/374
Programming Language: Assembly. **Assembler/Compiler:** 8080/8085 Macro Assembler, V3.0
Libraries: SYSTEM.LIB
Media Availability (Price Code): DISKETTE (B), SRC, OBJ; SOURCE LISTING (L); DOCUMENTATION

AD12, COMMUNICATION: TEKTRONIX DAS 9100 DIGITAL ANALYSIS SYSTEM TO INTEL DEVELOPMENT SYSTEM

Submitted by: Roy Kravitz, Intel Corporation

Abstract: This program may be used to control the operation of a Tektronix DAS 9100 Digital Analysis System equipped with the I/O option and connected to an Intel Development System. The program allows the user to hold a dialog with the DAS (through GPIB commands), save and restore DAS menu setups, and save the contents of the DAS acquisition memory. Communication is via an RS232C link between the DAS 9100 and the Development System.

Hardware Required: 8080/8085 based system, iSBC-534 communication expanison board; Tektronix DAS 9100 (with I/O option); RS232C Cable
Software Required: ISIS-II, V4.1
Registers Modified: All. **Required:** BLOCKS/1541
Programming Language: PL/M-80, ASM80. **Assembler/Compiler:** 8080/8085 Macro Assembler, V4.0, PL/M-80, V3.1
Libraries: PLM80.LIB, SYSTEM.LIB
Media Availability (Price Code): DISKETTE (B), SRC, OBJ, ABS.OBJ; SOURCE LISTING (L); DOCUMENTATION

AD13, COMMUNICATION: INTEL DEVELOPMENT SYSTEM TO/FROM VAX 11

Submitted by: F.M. Cady and S.A. Davidson, Montana State University, Bozeman, Montana

Abstract: This program allows an Intel Microcomputer Development system to transfer files to and from a VAX 11 running the VMS operating system, and to use the Intel MDS as a transparent terminal on the VAX. No provision is made for error checking.

Hardware Required Intellec Series II; serial port on a VAX with VMS
Software Required: ISIS-II
Registers Modified: All. **Required:** RAM/25 blocks; BLOCKS/451
Programming Language: PL/M-80; VAX FORTRAN. **Assembler/Compiler:** PL/M-80, V3.1; VAX FORTRAN Compiler
Libraries: SYSTEM.LIB, PLM80.LIB
Media Availability (Price Code): DISKETTE (F), SRC, OBJ, LST; SOURCE LISTING (L); DOCUMENTATION

AD14, COMMUNICATION: INTELLEC SYSTEM TO SERIAL OUTPUT DEVICE

Submitted by: Kenneth Hyams, Sloan Technology Corporation

Abstract: This program sends an Intellec Series II or III text file out serial channel 2 to a serial output device, such as a DECwriter, with optional tab spacing.

Hardware Required: Intellec Series II or III
Software Required: ISIS-II
Registers Modified: All. **Required:** RAM/64K; ROM/None; BLOCKS/119
Programming Language: PL/M-80. **Assembler/Compiler:** PL/M-80, V4.0
Libraries: SYSTEM.LIB, PLM80.LIB
Media Availability (Price Code): DISKETTE (B), SRC, OBJ, ABS.OBJ; PAPER TAPE (P), SRC; SOURCE LISTING (L); DOCUMENTATION

AD15, COMMUNICATION: INTEL DEVELOPMENT SYSTEM TO/FROM HEWLETT-PACKARD COMPUTER

Submitted by: Richard C. Turnock, Atlantis Flight Research, Downsview, Ontario, Canada

Abstract: This program allows an Intel Development System to transfer files to and from devices on a Hewlett-Packard computer running RTE. Transfers at 9600 baud, full duplex, can be achieved without any loss of data. ENQ/ACK and XON protocols are supported and the necessary conversions (tabs, etc.) are made.

Hardware Required: Intellec Series II; Hewlett-Packard computer running RTE with a serial port
Software Required: ISIS-II; RTE; FORTRAN (for H.P. programs)
Registers Modified: All. **Required:** RAM/36K; ROM/None. BLOCKS/1018
Programming Language: ASM-80, FORTRAN. **Assembler/Compiler:** 8080/8085 Macro Assembler, V4.1, FORTRAN
Libraries: SYSTEM.LIB
Media Availability (Price Code): DISKETTE (F), SRC, OBJ; SOURCE LISTING (L); DOCUMENTATION

AD16, COMMUNICATION: XEROX FILE TRANSFER FACILTIY

Submitted by: Steve Packer, Intel Corporation

Abstract: This program permits a System 86/330 to transfer files to or from another 86/330 using Ethernet and Xerox higher level protocols. (Source files provided by Insite under ISIS-II format must be converted by the user to RMX-86 format, after which Submit files may be used to build and link the entire package under RMX.)

Hardware Required: System 86/330 or equivalent; iSBC-550 Ethernet Controller; ISIS-II to RMX-86 file conversion capabilities.
Software Required: iRMX-86 Operating System, Release 4, configurable; Driver for iSBC-550 Ethernet Controller (Insite Order No. AB18); PL/M-86 and ASM-86.
Required: RAM/512K; BLOCKS/1439
Programming Language: PL/M-86, ASM-86. **Assembler/Compiler:** PL/M-86, V1.0; ASM-86, V1.0
Media Availability (Price Code): DISKETTE (H), SRC; DOCUMENTATION

AD17, COMMUNICATION: NDS-II TO/FROM iPDS RUNNING CP/M-80

Submitted by: Applications Engineering, Intel Corporation

Abstract: This program enables an iPDS running CP/M-80 to act as a smart terminal connected to an ISIS cluster board of an NDS-II network. UPLOAD and DNLOAD of files is provided.

Hardware Required: iPDS; null modem cable; NDS-II workstation; ISIS cluster board

Software Required: ISIS-III(N); iPDS CP/M-80

Required: BLOCKS/202, on ISIS formatted diskette; BYTES/6K, on iPDS CP/M-80 formatted diskette (both supplied by Insite)

Programming Language: PL/M-80. **Assembler/Compiler:** PL/M-80, V4.0

Libraries: SYSTEM.LIB, PLM80.LIB

Media Availability (Price Code): DISKETTE (F), COM

AD18, DOWNLOAD: iPDS TO SERIAL PORT

Submitted by: Matthew Legrand, Intel Corporation

Abstract: This program allows a file or user-entered sequence of bytes to be transmitted to a serial I/O port.

Hardware Required: iPDS; 3-wire RS232-compatible cable; device with serial I/O port to be downloaded to (must be able to interpret and load code sent to it)

Software Required: ISIS-PDS Operating System, including program SERIAL; user program to receive and load code from serial port

Required: RAM/9K; ROM/8 blocks, 1627 bytes; BLOCKS/205

Programming Language: PL/M-80. **Assembler/Compiler:** PL/M-80, V4.0

Libraries: SYSPDS.LIB, PLM80.LIB

Media Availability (Price Code): DISKETTE (H), SRC, OBJ, LST, ABS.OBJ; SOURCE LISTING (L)

SYSTEM TESTING

AE1, TEST: 8080 CPU

Submitted by: W. Iwamoto and R. Lonchar, North Electric Co., Columbus, OH

Abstract: This program is designed as an on-line periodic exercising program. Executes almost all 8080 instructions to ensure proper functioning of the CPU. Program either passes or halts upon error.

Hardware Required: Intellec System, 8080-based
Software Required: Monitor
Registers Modified: All, SP. **Assembler/Compiler:** RAM/3 bytes; ROM/376 bytes; BLOCKS/65
Programming Language: Assembly. **Assembler/Compiler:** 8080/8085 Macro Assembler, V3.0
Libraries: SYSTEM.LIB
Media Availability (Price Code): DISKETTE (B), SRC, OBJ; PAPER TAPE (P), SRC; SOURCE LISTING (L); DOCUMENTATION

AE2, DIAGNOSTICS: 8080 I/O

Submitted by: S.G. Thompson, Harris Controls, Melbourne, FL

Abstract: This program allows interactive testing of Intellec I/O ports. It also allows saving and reloading of the test program.

Hardware Required: Intellec System, 8080-based; Diskette Operating System
Software Required: ISIS-II
Registers Modified: All. **Required:** RAM/2340 bytes; ROM/none; BLOCKS/395
Programming Language: Assembly. **Assembler/Compiler:** 8080/8085 Macro Assembler, V3.0
Libraries: SYSTEM.LIB
Media Availability (Price Code): DISKETTE (A), SRC, OBJ; SOURCE LISTING (L); DOCUMENTATION

AE3, TEST: iSBC 80/10 I/O PORTS

Submitted by: Jeffrey W. Scott, Computer Applications, Sausalito, CA

Abstract: This program is an aid in debug of hardware interfacing to PPI ports. The user inputs port-values through the keyboard. The program outputs patterns to the PPI ports.

Hardware Required: iSBC 80/10; PROM programming capabilities
Software Required: ISIS-II
Registers Modified: All. **Required:** RAM/100 bytes; ROM/1024 bytes; BLOCKS/142
Programming Language: Assembly. **Assembler/Compiler:** 8080/8085 Macro Assembler, V3.0
Libraries: SYSTEM.LIB
Media Availability (Price Code): DISKETTE (A), SRC, OBJ; PAPER TAPE (P), SRC; SOURCE LISTING (L); DOCUMENTATION

AE4, TEST: MEMORY

Submitted by: Floyd L. Nordin, Nordin Enterprises, Cupertino, CA

Abstract: This program performs extensive bit pattern testing to RAM located above 0300H.

Hardware Required: Intellec 800 console device
Software Required: Monitor
Registers Modified: All. **Required:** RAM/750 bytes; BLOCKS/72
Programming Language: Assembly. **Assembler/Compiler:** 8080/8085 Macro Assembler, V3.0
Libraries: SYSTEM.LIB
Media Availability (Price Code): DISKETTE (A), SRC, OBJ; PAPER TAPE (P), SRC; SOURCE LISTING (L)

AE5, TEST: MEMORY

Submitted by: H.R. Pinnick Jr., S.E. Missouri State University, Cape Girardeau, MO

Absract: This program does a barber-pole test on memory using the pattern 00H, 11H, 22H, 44H, 88H, 0EEH, 0DDH, 0BBH, 77H. The odd number is an attempt to flag any memory overlap. This barber pole will work for NKx4 RAMs.

Hardware Required: 8080/8085 with 8251
Software Required: None
Registers Modified: All. **Required:** RAM/15H; ROM/2B3H; BLOCKS/574
Programming Language: Assembly. **Assembler/Compiler:** 8080/8085 Macro Assembler, V4.0
Media Availability (Price Code): DISKETTE (B), SRC, OBJ; SOURCE LISTING (L); DOCUMENTATION

AE6, DEMO SOFTWARE: 8275

Submitted by: Tom Rossi, Intel Corporation

Abstract: This is a program for the 8275 demo board, including character generator.

Hardware Required: 8275 low-cost CRT demo board
Software Required: ISIS-II, ASM-80
Registers Modified: All. **Required:** RAM/all; ROM/2 2716s; BLOCKS/429
Programming Language: Assembly. **Assembler/Compiler:** 8080/8085 Macro Assembler, V3.0
Libraries: SYSTEM.LIB
Media Availability (Price Code): DISKETTE (A), SRC, OBJ; SOURCE LISTING (L); DOCUMENTATION

AE7, DEMO: 208

Submitted by: Harley Johnson, Intel Corporation

Abstract: This program provides 17 commands to demonstrate the functionality of the iSBC 208 Flexible Disk Controller.

Hardware Required: Modular Chassis W/Power Supply, iSBC-064 RAM Board, iSBC-208 FDC
Software Required: D20810.OBJ or D20824.OBJ, FP208.OBJ, DR208.OBJ
Registers Modified: All. **Required:** RAM/64K bytes, ROM/8K bytes, BLOCKS/3168
Programming Language: Assembly. **Assembler/Compiler:** 8080/8085 Macro Assembler, V3.0
Media Availability (Price Code): DISKETTE (C), SRC, OBJ; DOCUMENTATION

AE8, DEMO: iRMX 86 MULTITASKING SPECTRUM ANALYSIS

Submitted by: G. Heider, Intel Corporation

Abstract: This program illustrates the multitasking system described in detail in AP Note 110. The system will sample an analog input signal and produce a spectrum display of the input signal.

Hardware Required: iSBC 711 Analog Input Board, iSBC 86/12A Single Board Computer, Hazeltine CRT Terminal, and a signal source. A signal source can be a microphone and preamplifier or a signal generator.
Software Required: iRMX 86 Nucleus
Registers Modified: All. **Required:** RAM/16K bytes, ROM/32K bytes, BLOCKS/2684
Programming Language: Assembly. **Assembler/Compiler:** MCS-86 Macro Assembler, V3.0
Media Availability (Price Code): DISKETTE (C), SRC, OBJ; DOCUMENTATION

AE9, DIAGNOSTIC: MICROCOMPUTER DEVELOPMENT SYSTEM 230

Submitted by: F.M. Cady, Montana State University, Bozeman, MT

Abstract: This disk diagnostic package enables a user to read and write desired sectors of the disk for trouble shooting and error recovery purposes. Operations can be performed in an auto-repeat mode which allows the user to observe control signals with an oscilloscope.

Hardware Required: Program was developed for an MDS 230
Required: PL/M-80, LINK, LOCATE, MDS monitor, V1.2
Registers Modified: None. **Required:** RAM/6K; ROM/MONITOR, V1.2; BLOCKS/731
Programming Language: PL/M-80. **Assembler/Compiler:** PL/M-80, V3.1
Libraries: SYSTEM.LIB, PLM80.LIB
Media Availability (Price Code): DISKETTE (C), SRC, OBJ, ABS.OBJ; SOURCE LISTING (L); DOCUMENTATION

AE10, TEST: MCS-48 FAMILY CPU

Submitted by: Pat Mullen, Intel Corporation

Abstract: This program tests the functionality of CPUs of the MCS-48 family. The hex file is to be programmed into an 8755A EPROM, and the functionality of the processor under test will be indicated by a blinking or nonblinking L.E.D. on a circuit board.

Hardware Required: 8755A EPROM, simple circuit board with L.E.D.; test 8035/39, 8048/49, 8748; 8243 I/O expander
Software Required: None
Required: BLOCKS/436
Programming Language: ASM-48. **Assembler/Compiler:** MCS-48/UPI-41 Macro Assembler, V3.0
Media Availability (Price Code): DISKETTE (C), SRC, HEX; SOURCE LISTING (L); DOCUMENTATION

AE11, COMPARE: 8048 OR 8049 ROMS

Submitted by: Pat Mullen, Intel Corporation

Abstract: This program allows an 8748 to read a test 8048 or 8049 ROM array and compare it to a reference 8048 or 8049 ROM. Alternatively, the test 8048 may be compared to another 8748 programmed with the desired object code, or the test 8049 may be compared to a 2K EPROM.

Hardware Required: 8748; simple circuit board with L.E.D.; test 8048/49; reference 8048/49; or reference 8748 or 2K EPROM
Software Required: None
Required: BLOCKS/199
Programming Language: ASM-48. **Assembler/Compiler:** MCS-48/UPI-41 Macro Assembler, V3.0
Media Availability (Price Code): DISKETTE (C), SRC, HEX; PAPER TAPE (P), SRC; SOURCE LISTING (L); DOCUMENTATION

AE12, TEST: ERROR CORRECTING CODE

Submitted by: R. Cohen, Intel Corporation

Abstract: This program performs an Error Correcting Code (ECC) Test for the iSBC boards listed below. It runs under the supervision of Super Monitor 86 (Insite Order No. AA21). Two tests are available: 8206 test and ECC Systems Test.

Hardware Required: iSBC 305/306/028X/056CX/012CX/028C/056C/012C (iSBC 305/306 runs System Test only and requires iSBC 028A/056A RAM Board); 8086-based iSBC board
Software Required: Super Monitor 86 (Insite Order No. AA21)
Registers Modified: All. **Required:** RAM/0-800H; ROM/16K; BLOCKS/722
Programming Language: ASM-86. **Assembler/Compiler:** MCS-86 Macro Assembler, V2.1
Media Availability (Price Code): DISKETTE (A), SRC, OBJ, ABS,OBJ; SOURCE LISTING (L); DOCUMENTATION

AE13, DEMO: iAPX-88

Submitted by: Dan Lenehan, Intel Corporation

Abstract: This package consists of four demonstration programs (Tiny Monitor, Tiny Basic Interpreter, 2K Chess, and 4K Chess) for the 4-chip or 7-chip iAPX-88 board described in Chapter 4 of The iAPX-88 Book (4K Chess works only with the full 7-chip configuration).

Hardware Required: 8088 CPU; 8284 clock generator; 8755A-2 EPROM; 8185 RAM; optionally, for full 7-chip configuration: another 8755A-2 EPROM; another 8185 RAM; 8155-2 RAM

Software Required: None

Required: BLOCKS/2250

Programming Language: ASM-86. **Assembler/Compiler:** MCS-86 Macro Assembler, V2.1

Media Availability (Price Code): DISKETTE (D), SRC, OBJ, HEX, LST (SRC and LST not available for Chess programs); SOURCE LISTING (L) (not available for Chess); DOCUMENTATION

OFFICE TOOLS

BA1, PRINT: COVER PAGE

Submitted by: Phil Greenburg, Conrac Corp., West Caldwell, NJ

Abstract: This program composes/prints a cover (identification) page from information supplied by the user. The program prompts user for: -Date; -Disk Name; -File Name; -Programmer's Name.

Hardware Required: Intellec System, 8080-based; Dual Diskette Operating System
Software Required: ISIS-II
Registers Modified: All. **Required:** RAM/3950 bytes; ROM/none; BLOCKS/249
Programming Language: Assembly. **Assembler/Compiler:** 8080/8085 Macro Assembler, V3.0
Libraries: SYSTEM.LIB
Media Availability (Price Code): DISKETTE (A), SRC, OBJ; PAPER TAPE (P), SRC; SOURCE LISTING (L)

BA2, RECOVERY: DISKETTE FILE

Submitted by: Ross Morgan, Intel Corporation

Abstract: This program finds and recovers data from a diskette file that was lost while using an ISIS editor.

Hardware Required: Intellec 800; Diskette Operating System, single density
Software Required: ISIS Text Editor, V1.1 or 1.6; ISIS-I or ISIS-II
Registers Modified: All. **Required:** RAM/32K; BLOCKS/54
Programming Language: Assembly. **Assembler/Compiler:** ISIS 800 Macro Assembler, V1.1
Media Availability (Price Code): DISKETTE (A), SRC; PAPER TAPE (P), SRC; SOURCE LISTING (L); DOCUMENTATION

BA3, EDITOR: TEXT, ISIS, X111

Submitted by: c/o Intel Corporation

Abstract: This program creates and edits textual material. It is an enhanced version of the Intel ISIS system editor, X106.

Hardware Required: Intellec System, 8080-based; Diskette Operating System
Software Required: ISIS-II
Required: BLOCKS/86
Media Availability (Price Code): DISKETTE (B), OBJ; DOCUMENTATION

BA4, EDIT: TEXT

Submitted by: Triyono, Naval Postgraduate School, Monterey, CA

Abstract: This program edits textual material. The editor is line-oriented, facilitating input, substitution, locate, and line moves/copies/deletes.

Hardware Required: Intellec, 8080-based; Diskette Operating System
Software Required: ISIS-II
Registers Modified: None. **Required:** ROM/15K; BLOCKS/1297
Programming Language: PL/M. **Assembler/Compiler:** ISIS-II; PL/M80, V3.0
Libraries: SYSTEM.LIB, PLM80.LIB
Media Availability (Price Code): DISKETTE (B), SRC, OBJ; SOURCE LISTING (L); DOCUMENTATION

BA5, PROCESSOR: TEXT

Submitted by: c/o Intel Corporation

Abstract: This program processes textual material into intended format using the format command language. Commands are interspersed within the source text. The user can specify margins, case headings and footings, paragraphs, center text, right justify, page footnote, underline, create tables, and more.

Hardware Required: Intellec, 8080-based; Diskette Operating System
Software Required: ISIS-II
Registers Modified: None. **Required:** ROM/8K; BLOCKS/1165
Programming Language: PL/M. **Assembler/Compiler:** PL/M-80
Libraries: SYSTEM.LIB, PLM80.LIB
Media Availability (Price Code): DISKETTE (D), SRC, OBJ; DOCUMENTATION

BA6, CHECKBOOK

Submitted by: Kerry Howell, Almac/Stroum Electronics, Portland, OR

Abstract: This program maintains a file (complete with password) of checks and deposits with a description of each. The program returns the balance to the console.

Hardware Required: Intellec 800/220/230
Software Required: ISIS-II, V2.0 or V3.4
Registers Modified: All. **Required:** RAM/64K; ROM/2K monitor; BLOCKS/354
Programming Language: FORTRAN. **Assembler/Compiler:** FORTRAN-80, V1.0
Libraries: F80RUN.LIB, F80ISS.LIB, FPEF.LIB, FPSOFT.LIB, PLM80.LIB
Media Availability (Price Code): DISKETTE (A), SRC, OBJ, ABS.OBJ; PAPER TAPE (P), SRC; SOURCE LISTING (L); DOCUMENTATION

BA7, PRINT: DISCOUNTED CASH FLOW

Submitted by: Gordon Flynn, Southern States Cooperative, Inc., Richmond, VA

Abstract: This program finds the percent discount for a cash flow for up to 100 years and prints out the cash flow and present worth for N years.

Hardware Required: Intellec 8080/8085-based
Software Required: ISIS-II
Required: BLOCKS/359
Programming Language: FORTRAN 77. **Assembler/Compiler:** FORTRAN-80, V2.0
Libraries: F80RUN.LIB, F80ISS.LIB, FPEF.LIB, FPSOFT.LIB, PLM80.LIB
Media Availability (Price Code): DISKETTE (A), SRC, OBJ; ABS.OBJ; PAPER TAPE (P); SRC; SOURCE LISTING (L)

BA8, GENERATE: CALENDAR

Submitted by: William R. Ott, Applied Data Communications, Santa Ana, CA

Abstract: This program generates/prints — on list device — a calendar for any operator-specified year.

Hardware Required: Intellec, 8080-based
Software Required: Monitor
Registers Modified: All. **Required:** RAM/708H; ROM/monitor I/O handlers or equal; BLOCKS/141
Programming Language: Assembly. **Assembler/Compiler:** 8080/8085 Macro Assembler, V2.0
Libraries: SYSTEM.LIB
Media Availability (Price Code): DISKETTE (A), SRC, OBJ; PAPER TAPE (P), SRC; SOURCE LISTING (L)

BA9, MAIL LIST

Submitted by: Kerry P. Howell, Almac/Stroum, Portland, OR

Abstract: This program allows the user to maintain a disk-based mailing list of name, company, phone, address, and optional attributes. The mailing list may then be printed to the console or onto shipping labels on the lineprinter. Required labels: Dennison #42-551-0.

Hardware Required: Intellec 800, 220, 230; diskette
Software Required: ISIS-II; monitor
Registers Modified: All. **Required:** RAM/32K bytes; ROM/2K bytes; BLOCKS/314
Programming Language: FORTRAN. **Assembler/Compiler:** FORTRAN-80, V1.0
Libraries: F80RUN.LIB, F80ISS.LIB, FPEF.LIB, FPSOFT.LIB, PLM80.LIB
Media Availability (Price Code): DISKETTE (B), SRC, OBJ, LST, ABS.OBJ; PAPER TAPE (P), SRC; SOURCE LISTING (L); DOCUMENTATION

BA10, MERGE: MAILING LIST

Submitted by: Kerry Howell, Almac/Stroum Electronics, Portland, OR

Abstract: This program merges two mailing lists (created by Program BA9) into one file, checking for name duplications; does not append duplications.

Hardware Required: Intellec 800/200/230; Diskette Operating System
Software Required: ISIS-II, V2.2 or V3.4; Program No. BA9
Registers Modified: All. **Required:** RAM/32K bytes; ROM/2K; BLOCKS/237
Programming Language: FORTRAN. **Assembler/Compiler:** FORTRAN-80, V2.0
Libraries: F80RUN.LIB, F80ISS.LIB, FPEF.LIB, FPSOFT.LIB, PLM80.LIB
Media Availability (Price Code): DISKETTE (A), SRC, OBJ, ABS.OBJ, LST; PAPER TAPE (P), SRC; SOURCE LISTING (L)

BA11, MAIL LIST

Submitted by: B.L. Masteller, Bendix-Mishawaka, Mishawaka, IN

Abstract: This program outputs a list of names/addresses that have been generated by the user to mail labels on the lineprinter. (Prints two labels per name.)

Hardware Required: Intellec 800; lineprinter
Software Required: ISIS-II
Registers Modified: All. **Required:** RAM/1160 + address file storage; BLOCKS/53
Programming Language: PL/M. **Assembler/Compiler:** PL/M-80, V3.0
Libraries: SYSTEM.LIB, PLM80.LIB
Media Availability (Price Code): DISKETTE (A), SRC, OBJ; PAPER TAPE (P), SRC; SOURCE LISTING (L)

BA12, MAIL LISTS FOR BASIC-80

Submitted by: Terry T. Steeden, Tau Sigma Consultants, Inc., Tonka Bay, MN

Abstract: This program allows the user to maintain disk files for mailing lists. Sorting is alphanumeric by zip code, last name, or company/title. Prints 3 or 4 line labels and complete reports.

Hardware Required: Intellec 800/220/230; lineprinter
Software Required: BASIC-80
Registers Modified: All. **Required:** RAM/64K; BLOCKS/235
Programming Language: BASIC. **Assembler/Compiler:** BASIC-80, V1.1
Media Availability (Price Code): DISKETTE (B), SRC, OBJ; SOURCE LISTING (L); DOCUMENTATION

BA13, SORT: GENERAL

Submitted by: Maessen JL, Bell Telephone Fgf. ITT, Geel, Belgium

Abstract: This sorting program works on complete lines or fields (e.g. Locate File: 1234H-PUB-NAME).

Hardware Required: Intellec Model 800; Diskette Operating System
Software Required: ISIS-II; monitor
Registers Modified: All. **Required:** RAM/1K bytes; BLOCKS/228
Programming Language: Assembly. **Assembler/Compiler:** 8080/8085 Macro Assembler, V3.0
Libraries: SYSTEM.LIB
Media Availability (Price Code): DISKETTE (B), SRC, OBJ; PAPER TAPE (P), SRC; SOURCE LISTING (L)

BA14, GENERATE: SOFTWARE DOCUMENTATION

Submitted by: Tom Dale, Intel Corporation

Abstract: This program generates documentation files from the comment fields of source or list files, accepting comments from PL/M, ASM, or FORTRAN.

Hardware Required: Intellec System 800 or Series-II or III
Software Required: ISIS-II
Registers Modified: All. **Required:** RAM/32K; BLOCKS/147
Programming Language: PL/M. **Assembler/Compiler:** PL/M-80, V3.0
Libraries: SYSTEM.LIB, PLM80.LIB
Media Availability (Price Code): DISKETTE (B), SRC, OBJ, ABS.OBJ; PAPER TAPE (P), SRC; SOURCE LISTING (L); DOCUMENTATION

BA15, GENERATE: DISK DIRECTORY LIBRARY

Submitted by: Stephen F. Bean, Autech Corporation, Colombus, OH

Abstract: This program constructs an alphabetically arranged library of program names from directories of several diskettes. The library is output to the system list device.

Hardware Required: Intellec 800 or Series-II
Software Required: ISIS-II
Registers Modified: All. **Required:** RAM/4864 bytes, BLOCKS/125
Programming Language: PL/M. **Assembler/Compiler:** PL/M-80, V3.0
Libraries: SYSTEM.LIB, PLM80.LIB
Media Availability (Price Code): DISKETTE (B), SRC, OBJ; SOURCE LISTING (L); DOCUMENTATION

BA16, GENERATE: TABS

Submitted by: Bob Glossman, c/o Intel Corporation

Abstract: This routine expands "Control-I" as a tab character for legible listings.

Hardware Required: Intellec, 8080-based; Diskette Operating System
Software Required: ISIS-II
Required: BLOCKS/44
Programming Language: Assembly. **Assembler/Compiler:** 8080 Macro Assembler, V1.1
Media Availability (Price Code): DISKETTE (A), SRC, OBJ; PAPER TAPE (P), SRC; SOURCE LISTING (L)

BA17, PRINT: FILE

Submitted by: L.R. Shenfield, Data Peripherals, Sunnyvale, CA

Abstract: This routine allows a file to be output to the lineprinter by typing "Print Filename" instead of "Copy filename to :LP:".

Hardware Required: Intellec Series-II
Software Required: ISIS-II
Required: RAM/33K bytes; BLOCKS/32
Programming Language: ASM-80. **Assembler/Compiler:** 8080/8085 Macro Assembler, V3.0
Libraries: SYSTEM.LIB
Media Availability (Price Code): DISKETTE (A), SRC, OBJ; PAPER TAPE (P), SRC; SOURCE LISTING (L); DOCUMENTATION

BA18, PRINT: FILES

Submitted by: Philip Weinstein, New York

Abstract: This program copies files to a Texas Instruments Omni 800 or Okidata Microline printer or to a disk file or CRT. Various control parameters support formatting of printed text and re- programming of software-settable printers.

Hardware Required: Intellec 8080/8085-based; T.I. Omni 800 or Okidata Microline printer
Software Required: ISIS-II; PL/M-80
Registers Modified: None. **Required:** RAM/None; ROM/none; BLOCKS/249
Programming Language: PL/M-80. **Assembler/Compiler:** PL/M-80, V3.1
Libraries: PLM80.LIB, SYSTEM.LIB
Media Availability (Price Code): DISKETTE (B), SRC, OBJ; PAPER TAPE (P), SRC; SOURCE LISTING (L); DOCUMENTATION

BA19: PRINT: FILES

Submitted by: G.F. Long, New Zealand Electricity, Wellington, New Zealand

Abstract: This program copies up to 100 files in a single statement to a line printer or CRT. Various control parameters allow the user to format text, number and title pages, select certain pages only for printing, print only those pages having error messages or a specified character string, etc.

Hardware Required: Intel MDS with Disk Operating System; Printer
Software Required: ISIS-II
Registers Modified: None. **Required:** RAM/None; ROM/None; BLOCKS/1503
Programming Language: PL/M-80. **Assembler/Compiler:** PL/M-80, V3.1
Libraries: PLM80.LIB, SYSTEM.LIB
Media Availability (Price Code): DISKETTE (C), SRC, OBJ, ABS.OBJ; SOURCE LISTING (L); DOCUMENTATION

BA20, WORD PROCESSOR

Submitted by: Charles Chernack, Consultant, Los Altos, CA

Abstract: This package is a set of special CREDIT macros and a format/listing program which makes document preparation easy using a Series-II Intellec System. Output can be directed to the lineprinter, to a Diablo 1650 printer on the :TO: port, or to an ISIS-II or NDS-II disk file. Some of the functions included are: -Centering of lines; -Paragraphs without internal carriage returns, facilitating insertion and deletion of phrases; -Variable left margin; -Automatic pagination; -Auto-deletion of blocks of text; -Underlining; -Fast movement of cursor; -120-column "wide mode" for processing of .LST files; -Etc.

Hardware Required: Intellec Series-II
Software Required: ISIS-II; CREDIT, V2.1
Required: BLOCKS/2151
Programming Languages: PL/M-80; ASM-80. **Assembler/Compiler:** PL/M, V3.1; 8080/8085 Macro Assembler, V4.0
Libraries: PLM80.LIB, SYSTEM.LIB
Media Availability (Price Code): DISKETTE (F), SRC, OBJ, LST, ABS.OBJ; DOCUMENTATION (detailed operating instructions)

BA21, SPELL

Submitted by: J. Hambler, S. Wachtel, Georgia Tech., Atlanta, GA

Abstract: This program collects words from an input text file. Any words not found in its 10,000 word dictionary will be placed in an output file.

Hardware Required: 8080/8085 based system
Software Required: Pascal-80, V2.0
Registers Modified: None. **Required:** RAM/64K; ROM/None; BLOCKS/1544
Programming Language: Pascal-80. **Assembler/Compiler:** Pascal-80, V2.0
Media Availability (Price Code): DISKETTE (C), SRC, ABS.OBJ; SOURCE LISTING (L); DOCUMENTATION

CONVERSION TOOLS

BB1, CONVERSION: ASCII TO/FROM EBCDIC

Submitted by: W.R. Ott, Applied Data Communications, Santa Ana, CA

Abstract: This routine converts an ASCII character in the accumulator, upon entry, to an EBCDIC character in the accumulator upon return. All other registers are safe.

Hardware Required: Intellec, 8080-based
Software Required: Monitor
Registers Modified: A. **Required:** RAM/411 bytes; ROM/none; BLOCKS/36
Programming Language: Assembly. **Assembler/Compiler:** 8080/8085 Macro Assembler, V3.0
Libraries: SYSTEM.LIB
Media Availability (Price Code): DISKETTE (A), SRC, OBJ; PAPER TAPE (P), SRC; SOURCE LISTING (L)

BB2, CONVERSION: HEX TO ASCII

Submitted by: Mike Lippman, Fluke Trendar, Mt. View, CA

Abstract: This subroutine converts a string of hexadecimal bytes in memory (string length variable up to 255) into an ASCII character string in memory for display or transmission.

Hardware Required: Intellec System, 8080-based
Software Required: Subroutine call with input parameters initialized
Registers Modified: A, H, L, D, E, B. **Required:** RAM/dependent on input string length; ROM/49 bytes; BLOCKS/74
Programming Language: Assembly. **Assembler/Compiler:** 8080/8085 Macro Assembler, V3.0
Libraries: SYSTEM.LIB
Media Availability (Price Code): DISKETTE (A), SRC, LIST, OBJ; PAPER TAPE (P), SRC; SOURCE LISTING (L)

BB3, CONVERSION: MCON-6800 SOURCE CODE TO 8086/8088 SOURCE CODE

Submitted by: c/o IntelCorporation

Abstract: MCON is a stand-alone program written to convert 6800 (Motorola) source code to 8086 or 8088 source code.

Hardware Required: 8086/8088
Software Required: ISIS-II
Required: BLOCKS/138
Media Availability (Price Code): DISKETTE (B), OBJ; DOCUMENTATION

BB4, CONVERSION: ZCON-Z80 to 8086/8088 SOURCE CONVERTER

Submitted by: c/o Intel Corporation

Abstract: This is a stand-alone program whose purpose is to convert a source program written in standard (Mostek) Z80 assembly language into 8086 source language as defined by Version 1.0 of Intel's 8086 Cross Assembler.

Hardware Required: 8080/8085
Software Required: ISIS-II
Required: BLOCKS/645
Programming Language: PL/M-80
Media Availability (Price Code): DISKETTE (B), OBJ; DOCUMENTATION

BB5, CONVERSION: ASCII FLOATING POINT NUMBERS TO AM9711 AND INTEL 8231 4-BYTE FP FORMAT

Submitted by: Kent C. Leonard, Bowditch Navigation systems, Orange, CA

Abstract: This program converts a FP number in ASCII format to a 4-byte number in AM9511 FP format. The mantissa values before and after the decimal point, and the exponent values, are all converted into AM9511 4-byte integers. The mantissa sign, exponent sign, and number of digits in the mantissa after the decimal point are saved. Then the integer values are floated and the desired floating point is computed.

Hardware Required: AM9511 connected either to two 8-bit I/O ports or two DMA locations are necessary
Software Required: ISIS-II
Registers Modified: All. **Required:** RAM/01C4H bytes; ROM/0013H bytes; BLOCKS/75
Programming Language: Assembly. **Assembler/Compiler:** 8080/8085 Macro Assembler, V3.0
Libraries: SYSTEM.LIB
Media Availability (Price Code): DISKETTE (B), SRC, OBJ; PAPER TAPE (P), SRC; SOURCE LISTING (L); DOCUMENTATION

BB6, CONVERSION: BINARY TO BCD

Submitted by: J.G. Errington, University of Canterbury, Christchurch, New Zealand

Abstract: This routine converts up to 31 binary bytes to BCD.

Hardware Required: 8048 Processor
Software Required: N/A
Registers Modified: R0, R1, R6, A. **Required:** RAM/Variable, user defined; ROM/2A bytes; BLOCKS/108
Programming Lanuage: Assembly. **Assembler/Compiler:** MCS-48/UPI-41 Macro Assembler, V3.0
Libraries: SYSTEM.LIB
Media Availability (Price Code): DISKETTE (A), SRC, OBJ, LST, ABS.OBJ; PAPER TAPE (P), SRC; SOURCE LISTING (L)

BB7, CONVERSION: BINARY TO BCD

Submitted by: Michael Cerulo, John Deere PEC, Waterloo, Iowa
Abstract: This program has four routines to handle conversion and manipulation of binary and BCD for the 8048; 1) 8-bit binary to 2-digit BCD conversion; 2) 2-digit BCD to 8-bit binary conversion; 3) formation of the negative of an n-digit BCD number; 4) comparison of two 2-digit BCD numbers.

Hardware Required: 8048 or 8748
Software Required: None
Registers Modified: Accumulator, R0, R1, R2. **Required:** RAM/19 bytes max.; BLOCKS/25
Programming Language: ASM-48. **Assembler/Compiler:** MCS-48/UPI-41 Macro Assembler, V4.0
Media Availability (Price Code): DISKETTE (B), SRC, HEX; PAPER TAPE (P), SRC; SOURCE LISTING (L); DOCUMENTATION

BB8, CONVERSION: CONVERT/FORMAT/PRINT

Submitted by: James Haag, University of San Francisco, San Francisco, CA

Abstract: This program converts, formats and prints internal data types and strings. Provides print capabilities similar to Pascal write and PL/1 put list.

Hardware Required: 8080-based system
Software Required: Write routine per ISIS-II specification
Registers Modified: All. **Required:** RAM/size of write + 1900; ROM/None; BLOCKS/158
Programming Language: PL/M. **Assembler/Compiler:** PL/M-80, V3.1
Media Availability (Price Code): DISKETTE (B), SRC, OBJ; PAPER TAPE (P), SRC, SOURCE LISTING (L); DOCUMENTATION

BB9, CONVERSION: DECIMAL TO/FROM FLOATING POINT

Submitted by: G. DeGrandi, N. Coppo, Comm. of European Communities JRC Ist. of Ispra, Ispra (Varese), Italy

Abstract: This program acquires the decimal number from the console and converts/displays the equivalent floating point number.

Hardware Required: Intellec 800
Software Required: ISIS-II
Registers Modified: All. **Required:** RAM/5FH; ROM/D93H; BLOCKS/600
Programming Language: Assembly **Assembler/Compiler:** 8080/8085 Macro Assembler, V3.0
Libraries: SYSTEM.LIB, FPAL.LIB
Media Availability (Price Code): DISKETTE (A), SRC, LST, OBJ; SOURCE LISTING (L); DOCUMENTATION

BB10, CONVERSION: FORTRAN OR FPAL FLOATING POINT TO/FROM DECIMAL

Submitted by: Sang, Hoechst Ag, Tes, West Germany

Abstract: This utility routine converts a FORTRAN or FPAL floating point number from their internal representation to/from a decimal notation.

Hardware Required: Micro Development system
Software Required: ISIS-II
Registers Modified: All. **Required:** RAM/32K; BLOCKS/547
Programming Language: FORTRAN. **Assembler/Compiler:** FORTRAN-80, V2.1
Libraries: F80RUN.LIB, F80ISS.LIB, FPEF.LIB, FPSOFT.LIB, PLM80.LIB
Media Availability (Price Code): DISKETTE (B), SRC, OBJ; SOURCE LISTING (L); DOCUMENTATION

BB11, CONVERSION: ASCII TO/FROM FLOATING POINT

Submitted by: P.M. Callihan, Goodyear Atomic Corp., Piketon, OH

Abstract: This program converts a free-form ASCII string to/from a floating point number.

Hardware Required: Intellec System, 8080-based
Software Required: ISIS-II
Registers Modified: A, D, E, H, L. **Required:** RAM/23 bytes; ROM/587 bytes; BLOCKS/489
Programming Language: Assembly. **Assembler/Compiler:** 8080/8085 Macro Assembler, V3.0
Libraries: SYSTEM.LIB, FPAL.LIB
Media Availability (Price Code): DISKETTE (B), SRC, LIST, OBJ; PAPER TAPE (P), SRC; SOURCE LISTING (L)

BB12, CONVERSION: ASCII CODE TO/FROM INTEL FLOATING POINT

Submitted by: Bart Evans, Durrum Instrument, Sunnyvale, CA

Abstract: There are two modules to this program which: 1) converts an ASCII string to a floating point number in the Floating Point Record; and 2) converts floating point number in FPR to ASCII string of 14 characters.

Hardware Required: Intellec 800
Software Required: ISIS-II
Registers Modified: All. **Required:** RAM/24 variable + 4 stack; ROM/813; BLOCKS/150
Programming Language: PL/M. **Assembler/Compiler:** PL/M-80 Compiler, V3.0
Libraries: SYSTEM.LIB, PLM80.LIB, FPAL.LIB
Media Availability (Price Code): DISKETTE (A), SRC, OBJ, ABS.OBJ; PAPER TAPE (P), SRC; SOURCE LISTING (L)

BB13, CONVERSION: ASCII-DECIMAL TO/FROM FPAL NUMBER

Submitted by: Kelly P. Golden, Dupont Instruments, Wilmington, Delaware

Abstract: This program converts a decimal number in the FPAL range to a 4-byte hexadecimal representation of the FPAL floating point result. The program also does vice versa. FORTRAN-80 subroutines are used to acquire decimal number and to print out decimal equivalent.

Hardware Required: Intellec System
Software Required: ISIS-II
Required: BLOCKS/508
Programming Language: PL/M and FORTRAN. **Assembler/Compiler:** PL/M-80, V3.0 and FORTRAN-80, V2.0
Libraries: F80RUN.LIB, F80ISS.LIB, FPEF.LIB, FPSOFT.LIB, FPAL.LIB, SYSTEM.LIB, PLM80.LIB
Media Availability (Price Code): DISKETTE (B), SRC, OBJ, LST, ABS.OBJ; PAPER TAPE (P), SRC; SOURCE LISTING (L); DOCUMENTATION is part of source code

BB14, CONVERSION: ASCII TO FLOATING POINT

Submitted by: Jan Duits, SKF Engineering and Research Center, The Netherlands

Abstract: This program contains four FPAL compatible routines: 1) Converts an ASCII String into a floating point number; 2) Converts a signed 16-bit integer into a floating point number; 3) Converts the float to ASCII conversion with the length and precision specified, and 4) Converts a floating point number to an ASCII string with the length and precision specified. All four routines are fully reentrant and are not using any fixed RAM area.

Hardware Required: 8080/8085 based system
Software Required: PL/M-80, FPAL.LIB
Required: BLOCKS/80
Programming Language: PL/M-80. **Assembler/Compiler:** PL/M-80, V3.1
Libraries: FPAL.LIB
Media Availability (Price Code): DISKETTE (D), SRC, OBJ; PAPER TAPE (P), SRC; SOURCE LISTING (L); DOCUMENTATION

BB15, COPY: PDP-11 DISK FILE TO INTEL ISIS-II DISK FILE

Submitted by: Steven M. Freeman, Ameromatic Corporation, Birmingham, AL

Abstract: This program copies PDP-11, RT-11 structured file on drive 1 to ISIS-II structured file on drive 0.

Hardware Required: DEC PDP-11 with Sykes disk drives
Software Required: ISIS-II; RT-11
Required: RAM/1K + bytes; BLOCKS/46
Programming Language: Assembly. **Assembler/Compiler:** 8080/8085 Macro Assembler, V2.0
Libraries: SYSTEM.LIB
Media Availability (Price Code): DISKETTE (B), SRC; SOURCE LISTING (L)

BB16, COMMUNICATION: DEC PDP-11 TO INTELLEC DEVELOPMENT SYSTEM

Submitted by: Chris Jones & George Capian, Nova Biomedical, Newton, MA

Abstract: This program copies first file from a PDP-11 single density diskette (RT-11) to an Intellec Microcomputer Development System ISIS-II diskette file. PDP-11 diskette must have been recorded on DEC RX-1 (or equivalent) diskette drive using DEC RT-11 source driver.

Hardware Required: Intellec Model 800
Software Required: ISIS-II
Required: RAM/less than 1K; BLOCKS/102
Programming Language: Assembly. **Assembler/Compiler:** 8080/8085 Macro Assembler, V3.0
Libraries: SYSTEM.LIB
Media Availability (Price Code): DISKETTE (C), SRC, OBJ; SOURCE LISTING (L); DOCUMENTATION

BB17, UTILITIES: RT11 DISKETTE UTILITY FOR INTELLEC 800

Submitted by: Bruce G. Dealhoy, AES Data Ltd., Mississauga, Ontario, Canada

Abstract: This package allows an Intellec Model 800 user to perform file- and block-oriented operations between a PDP-11 diskette on drive 1 and an ISIS-II diskette on drive 0, included operations are dumps, prints, file transfers, absolute disk copies, verifications, directory manipulation.

Hardware Required: Intellec Model 800
Software Required: ISIS-II, LINK, LOCATE
Registers Modified: All. **Required:** RAM/9.7K + 17K for data; ROM/none; BLOCKS/786
Programming Language: PL/M. **Assembler/Compiler:** PL/M-80, V3.1
Libraries: SYSTEM.LIB, PLM80.LIB
Media Availability (Price Code): DISKETTE (D), SRC, OBJ, ABS.OBJ; SOURCE LISTING (L); DOCUMENTATION

BB18, CONVERSION: ISIS-II TO/FROM CP/M

Submitted by: Rajcan Peter, VS Martin, Czechoslovakia

Abstract: This program converts ASCII or hex files between operating systems ISIS-II and CP/M, using single-density drives 0 and 1.

Hardware Required: Intellec MDS with 64K RAM; single-density drives 0 and 1.
Software Required: ISIS-II
Required: BLOCKS/290
Programming Language: Assembly. **Assembler/Compiler:** ASM-80,V4.0
Libraries: SYSTEM.LIB
Media Availability (Price Code): DISKETTE (H), SRC, OBJ, ABS, OBJ; SOURCE LISTING (L); DOCUMENTATION

BB19, SIMULATOR: 8048/49 CODE, V1.3

Submitted by: E.L. Jones, Wits. University, Johannesburg, South Africa

Abstract: This program simulates an 8048/49 microprocessor with 8243 I/O expander. It accepts a hexadecimal code file containing 8048 machine instructions.

Hardware Required: Intellec 800; Diskette Operating System
Software Required: ISIS-II, 8048 Assembler
Registers Modified: All. **Required:** RAM/32K; ROM/219BH; BLOCKS/240
Programming Language: Assembly and PL/M. **Assembler/Compiler:** 8080/8085 Macro Assembler, V2.0; PL/M-80, V3.0
Libraries: SYSTEM.LIB, PLM80.LIB
Media Availability (Price Code): DISKETTE (B), SRC, OBJ, ABS.OBJ; SOURCE LISTING (L); DOCUMENTATION

BB20, SIMULATOR: 8048/49 SIMULATOR

Submitted by: F.E. Rohling, Georgia Tech., Atlanta, GA

Abstract: This program simulates an 8048/49 microprocessor on an Intel MDS system. The user can disassemble instructions and display the contents of all internal registers.

Hardware Required: MDS system with 64K RAM
Software Required: ASM-48, PL/M-80, ASM80
Registers Modified: N/A. **Required:** RAM/64K; ROM/none; BLOCKS/2091
Programming Language: PL/M-80. **Assembler/Compiler:** PL/M-80, V3.1
Media Availability (Price Code): DISKETTE (D), SRC, OBJ, ABS.OBJ; SOURCE LISTING (L); DOCUMENTATION

BB21, CONVERT: FIXED POINT TO FLOATING POINT

Submitted by: Jean-Pol Mura, Sereg Jauges Nucleometre, Sarcelles, France

Abstract: This routine converts a two-byte integer into a four-byte floating point number and returns the address of that number to the calling program. The routine requires 38 bytes of ROM vs. the FLTDS routine of FPAL.LIB which requires 116 bytes.

Hardware Required: 8080/8085-based
Software Required: FPAL.LIB
Registers Modified: H,L,B,C,A,D,E. **Required:** RAM/4 bytes; ROM/38 bytes; BLOCKS/58
Programming Language: ASM-80. **Assembler/Compiler:** 8080/8085 Macro Assembler, V4.1
Libraries: FPAL.LIB
Media Availability (Price Code): DISKETTE (A), SRC, OBJ; PAPER TAPE (P), SRC; SOURCE LISTING (L)

BB22, CONVERT: DOUBLEWORD TO ASCII STRING

Submitted by: Roy F. Carlson, Micro-Managers, Inc., Madison, WI

Abstract: This routine converts a doubleword in memory to an ASCII string in any base desired. The string may be of variable length and may have any leading characters.

Hardware Required: 8086 or 8088-based
Software Required: Series-III PL/M-86, V2.0
Registers Modified: All. **Required:** RAM/273 bytes; ROM/none; BLOCKS/113
Programming Language: PL/M-86. **Assembler/Compiler:** Series-III PL/M-86, V2.0
Libraries: PLM86.LIB, LARGE.LIB
Media Availability (Price Code): DISKETTE (A), SRC, OBJ; PAPER TAPE (P), SRC; SOURCE LISTING (L)

CROSS TRANSLATORS

Note: These cross-translator programs, like all Insite software, are supplied only on ISIS-formatted diskette, CP/M-80-formatted diskette, or ASCII-coded paper tape.

BC1, ASSEMBLER, CROSS: MCS-48

Submitted by: M.A. Pordes, GEC Hirst Research Centre, London, England

Abstract: This program provides MCS-48 interpretive cross-assembly running on the Intellec 8/MOD80, with complete listing of address, machine code, and assembly language mnemonic for each instruction.

Hardware Required: Intellec 8/MOD80; TTY: ASR-33
Software Required: Intellec 8/MOD80 Monitor, V3.0
Registers Modified: All. **Required:** RAM/11 bytes + stack; ROM/2412 bytes; BLOCKS/201
Programming Language: Assembly. **Assembler/Compiler:** 8080/8085 Macro Assembler, V2.0
Libraries: SYSTEM.LIB
Media Availability (Price Code): DISKETTE (A), SRC; PAPER TAPE (P), SRC; SOURCE LISTING (L); DOCUMENTATION

BC2, ASSEMBLER, CROSS: DEC PDP-8 OR PDP-11

Submitted by: Rex Tracy, Colorado State University, Ft. Collins, CO

Abstract: This program assembles programs written in standard Intel 8080 assembly code on a DEC system. The output is a listing with symbol table and a hex file (Intel compatible).

Hardware Required: DEC PDP-8 or PDP-11
Software Required: OS8 (PDP-8) or RT-11 (PDP-11); DEC
Required: RAM/16K bytes; BLOCKS/281
Programming Language: FORTRAN
Media Availability (Price Code): DISKETTE (B), SRC; PAPER TAPE (P), SRC; SOURCE LISTING (L)

BC3, ASSEMBLER, CROSS: DEC PDP-11

Submitted by: John Anderson and William Galway, University of Utah

Abstract: This program contains PDP-11 macros to define the Intel 8080 Macro Assembler. It performs assembly of 8080 assembly language source programs. The output is an assembly listing and PDP-11 format binary code.

Hardware Required: DEC PDP-11
Software Required: DOS; PDP-11 Macro Assembler
Required: RAM/4K bytes; BLOCKS/96
Programming Language: Assembly
Media Availability (Price Code): DISKETTE (B), SRC; PAPER TAPE (P), SRC; SOURCE LISTING (L)

BC4, ASSEMBLER, CROSS: PDP-11

Submitted by: R.A. Parker, Loyalist College, Belleville, Ontario

Abstract: This program accepts a source file and converts the 8080/8085 mnemonics into a hexadecimal file for loading into memory, and a listing file.

Hardware Required: Digital Equipment Corp. PDP-11 with RSTS Basic-plus. Could be modified to operate under any extended Basic.
Software Required: An editor for preparation of the source file
Required: BLOCKS/117
Programming Language: BASIC
Media Availability (Price Code): DISKETTE (B), SRC; PAPER TAPE (P), SRC; SOURCE LISTING (L); DOCUMENTATION

BC5, ASSEMBLER, CROSS: 8008 CODE

Submitted by: H. Webster, Bedford Computer Systems, Bedford, MA

Abstract: This program provides two functions: -MACRO definition set which permits assembly of programs written in 8008 assembly language using an 8080 Macro Assembler; -Post assembly processor which reads the created list file and outputs a readable object listing to the lineprinter.

Hardware Required: Intellec, 8080-based; lineprinter
Software Required: ISIS-II
Required: RAM/905 bytes; ROM/3108 bytes; BLOCKS/248
Programming Language: Assembly. **Assembler/Compiler:** 8080/8085 Macro Assembler, V2.0
Libraries: SYSTEM.LIB
Media Availability (Price Code): DISKETTE (B), SRC; PAPER TAPE (P), SRC; SOURCE LISTING (L)

BC6, ASSEMBLER, CROSS: 8048 ON DG NOVA

Submitted by: Robert Capuder, Fairchild Weston Systems, Syosset, NY

Abstract: This program is a 2-pass assembler for 8048 source code in a Data General disk file. It outputs a hex file suitable for burning a PROM or punching a paper tape, and a listing file.

Hardware Required: Any DG Nova or Eclipse series minicomputer with 64K
Software Required: RDOS, FORTRAN IV
Required: RAM/52K; ROM/none; BLOCKS/366
Programming Language: DG FORTRAN IV
Media Availability (Price Code): DISKETTE (B), SRC; PAPER TAPE (P), SRC; SOURCE LISTING (L); DOCUMENTATION

DEBUG TOOLS

BD1, DISASSEMBLER: 8080 CODE

Submitted by: Manuel Puigbo, Elecma, Barcelona, Spain

Abstract: This program transforms machine code in memory to a listing of: -Addresses; -Machine codes.

Hardware Required: Intellec 8/MOD80; TTY: ASR-33
Software Required: Intellec 8/MOD80 Monitor, V3.0
Registers Modified: A, B, C, D, E, H, L. **Required:** RAM/255 bytes; ROM/1024; BLOCKS/86
Programming Language: Assembly. **Assembler/Compiler:** 8080/8085 Macro Assembler, V2.0
Media Availability (Price Code): DISKETTE (A), SRC, OBJ; PAPER TAPE (P), SRC; SOURCE LISTING (L)

BD2, DISASSEMBLER: 8080 OBJECT CODE

Submitted by: S.N. Brunner, General Electric, Erie, PA

Abstract: DISASM is intended as a software development and debugging aid. Operating on resident object code, it produces an assembly language equivalent which is printed on a TTY terminal. The program starts at a given memory address and steps sequentially through memory until manually halted.

Hardware Required: Intellec Model 8/MOD80; TTY: ASR-33
Software Required: Intellec 8/MOD80 Monitor
Registers Modified: A, B, C, D, H, L. **Required:** RAM/2 bytes; ROM/791 bytes; BLOCKS/40
Programming Language: Assembly. **Assembler/Compiler:** 8080/8085 Macro Assembler, V3.0
Libraries: SYSTEM.LIB
Media Availability (Price Code): DISKETTE (A), SRC, OBJ; PAPER TAPE (P), SRC; SOURCE LISTING (L)

BD3, DISASSEMBLER: ICE-80, VER 2.1

Submitted by: Ove Andersson, Intel Scandinavia, Copenhagen, Denmark

Abstract: This program translates control-block information to assembly statements that are output to the selected list device.

Hardware Required: Intellec System; ICE-80
Software Required: ICE-80, V2.0 and Monitor V1.0 or ICE-80, V1.0 and Monitor V1.2
Register Modified: All. **Required:** RAM/1121 bytes; BLOCKS/118
Programming Language: Assembly.
Media Availability (Price Code): DISKETTE (A), SRC; PAPER TAPE (P), SRC; SOURCE LISTING (L)

BD4, DISASSEMBLER: 8080 CODE

Submitted by: Erick Serdahl, Acurex Corp Icore Dive., Moutain View, CA

Abstract: This program generates a symbolic assembly language program suitable for editing and assembly. The input is an ISIS-II hex format file.

Hardware Required: Intellec 800 System
Software Required: PL/M-80 Compiler; ISIS-II
Registers Modified: All. **Required:** RAM/32-64K; BLOCKS/218
Programming Language: PL/M. **Assembler/Compiler:** PL/M-80, V3.0
Libraries: SYSTEM.LIB, PLM80.LIB
Media Availability (Price Code): DISKETTE (C), SRC, OBJ, ABS.OBJ; SOURCE LISTING (L); DOCUMENTATION

BD5, DISASSEMBLER: ISIS-II OBJECT FILES

Submitted by: Dave Jacobs and Larry Joba, Coherent Medical, Palo Alto, CA

Abstract: This is a two-pass disassembler designed to run under an ISIS-II operating system. It takes a standard object file as input and generates an assembly language listing of the object file.

Hardware Required: 8080/8085
Software Required: ISIS-II with 64K of memory; monitor
Required: RAM/38K bytes; BLOCKS/258
Programmng Language: Assembly. **Assembler/Compiler:** 8080/8085 Macro Assembler, V3.0
Libraries: SYSTEM.LIB
Media Availability (Price Code): DISKETTE (C), SRC, OBJ; SOURCE LISTING (L); DOCUMENTATION

BD6, DISASM

Submitted by: Susan Papa, Fairchild Weston System, Syosset, NY

Abstract: This program operates on the resident hex object code located between a given starting and ending memory location and disassembles it into its corresponding 8080/8085A Assembly Language mnemonics.

Hardware Required: MDS System 800
Software Required: ISIS-II, 32K byte memory
Registers Modified: All. **Required:** RAM/2.4K bytes, ROM/none, BLOCKS/177
Programming Language: Assembly. **Assembler/Compiler:** 8080/8085 Macro Assembler, V4.0
Libraries: SYSTEM.LIB
Media Availability (Price Code): DISKETTE (B), SRC, OBJ; PAPER TAPE (P), SRC; SOURCE LISTING (L); DOCUMENTATION

BD7, INTERPRETER: SINGLE-STEP

Submitted by: F. Postlbauer, Electronikbau, Linz, Ausria

Abstract: This program is a debugging aid which allows single-step interpretation of instructions, displays processor activities in disassembled 8080/8085 Assembly language mnemonics, and displays contents of registers and flags.

Hardware Required: Intellec MDS or user hardware with terminal
Software Required: Intellec MDS monitor or I/O-compatible monitor
Registers Modified: None. **Required:** RAM/64K, ROM/none, BLOCKS/252
Programming Language: ASM-80. **Assembler/Compiler:** 8080/8085 Macro Assembler, V4.0
Media Availability (Price Code): DISKETTE (B), SRC, OBJ, ABS.OBJ; SOURCE LISTING (L); DOCUMENTATION

BD8, DISASSEMBLER: 8048 OBJECT CODE

Submitted by: Udo Klocke, Schoppe & Faeser Gmbh, Minden, West Germany

Abstract: This program disassembles an 8048 object code program previously loaded into the MDS memory (e.g. with UPM). The object code may be at every memory location greater than 6000H. Outputs progam listing to disk with only symbolic code and tab characters; or outputs absolute location, object code, line number, and the symbolic code to any output device.

Hardware Required: Intellec with at least 32K-byte memory
Software Required: ISIS-II, V3.4 or later; monitor, V2.0
Required: RAM/6014 bytes; BLOCKS/309
Programming Language: Assembly. **Assembler/Compiler:** 8080/8085 Macro Assembler, V3.0
Libraries: SYSTEM.LIB
Media Availability (Price Code): DISKETTE (C), SRC, OBJ; SOURCE LISTING (L); DOCUMENTATION

BD9; TRACE: ICE-80

Submitted by: C.J. Lusby Taylor, Intel Corporation

Abstract: This program is an ICE MDSCALL which gives comprehensive dump and trace information on the console device. The output displays the current timer, all flags as symbols, all registers in hex, P.C. in hex and symbolic mnemonic, operand in hex and symbolic. All display is on one line. Symbols are taken from the ICE symbol tables and PL/M line number tables. In addition, in GO mode, trace displays the 44-cycle history, by symbolic disassembly.

Hardware Required: Intellec System; ICE-80
Software Required: ISIS-II; ICE-80
Required: RAM/1121; BLOCKS/117
Progamming Language: Assembly. **Assembler/Compler:** 8080/8085 Macro Assembler, V2.0; Trace, ICE-80, V4.4
Media Availability (Price Code): DISKETTE (C), SRC; PAPER TAPE (P), SRC; SOURCE LISTING (L)

BD10, COUNT: ICE-80 MACHINE CYCLES

Submitted by: Dalibor Nemec and Karel Janu, Czechoslovakia

Abstract: This program enables a user by means of an Interrupt 7 to display the length of emulated instructions in machine cycles since the last INT7 depression.

Hardware Required: Intel MDS; ICE-80
Software Required: ISIS-II; ICE-80
Required: BLOCKS/44
Programming Language: PL/M-80. **Assembler/Compiler:** PL/M-80, V3.1
Libraries: PLM80.LIB, SYSTEM.LIB
Media Availability (Price Code): DISKETTE (A), SRC, OBJ, ABS.OBJ; PAPER TAPE (P), SRC; SOURCE LISTING (L); DOCUMENTATION

BD11, COMPARE: FILES

Sumitted by: D. W. Wright, Standard Telecommunication Laboratories Ltd., Harlow, U.K.

Abstract: This program compares two files for similarities. If the files are identical, a message to that effect is output to the console; if not, the differences are listed on the console, along with the hex location, for the first eight bytes that differ (beyond that, further differences are not output, but the total number of differences is stated at the end).

Hardware Required: Intellec 800; console device
Software Required: ISIS-II
Registers Modified: All. **Required:** RAM/32K; BLOCKS/74
Programming Language: PL/M-80 and ASM-80. **Assembler/Compiler:** PL/M-80, V3.0 and 8080/8085 Macro Assembler, V3.0
Libraries: SYSTEM.LIB, PLM80.LIB
Media Availability (Price Code): DISKETTE (B), SRC, OBJ, ABS.OBJ; PAPER TAPE (P), SRC; SOURCE LISTING (L); DOCUMENTATION

BD12, LIST: FILE ERRORS

Submitted by: M. Polad, Data Card Corporation, Minneapolis, MN

Abstract: This program searches a diskette list file for assembly errors and lists lines containing the errors to the console device.

Hardware Required: Intellec 800; Diskette Operating System
Software Required: Monitor
Programming Language: Assembly. **Assembler/Compiler:** 8080 Macro Assembler, V1.1
Libraries: SYSTEM.LIB
Media Availability (Price Code): DISKETTE (A), SRC, OBJ; PAPER TAPE (P), SRC; SOURCE LISTING (L)

BD13, LIST: PL/M COMPILER ERRORS

Submitted by: Prof. Ing, Dalibor Nemec, VSE, Pelhrimovska, Praha, Czech.

Abstract: This program lists to the console device errors of the output listing file from a PL/M compilation

Hardware Required: Intellec Model 800; dual diskette
Software Required: ISIS-II
Registers Modified: All. RAM/315; ROM/none; BLOCKS/21
Programming Language: Assembly. **Assembler/Compiler:** 8080/8085 Macro Assembler, V3.0
Libraries: SYSTEM.LIB
Media Availability (Price Code): DISKETTE (A), SRC, OBJ; PAPER TAPE (P), SRC; SOURCE LISTING (L)

BD14, LIST: SAVE ERROR

Submitted by: Philip Weinstein, New York

Abstract: This program builds a history file of end-compilation error messages resulting from a sequence of compilations and assemblies. This program is most useful in a SUBMIT control file.

Hardware Required: 8080/8085-based system
Software Required: PL/M, ISIS-II
Registers Modified: All. **Required:** RAM/1K; ROM/4K; BLOCKS/598
Programming Language: PL/M-80. **Assembler/Compiler:** PL/M-80, V3.1
Libraries: SYSTEM.LIB, PLM80.LIB
Media Availability (Price Code): DISKETTE (A); SRC, OBJ, ABS.OBJ; PAPER TAPE (P), SRC; SOURCE LISTING (L); DOCUMENTATION

BD15, BREAKPOINT: 8089

Submitted by: Dave Ferguson, Intel Corporation

Abstract: This routine is the 8089 breakpoint routine for saving and displaying (on CRT) all registers.

Hardware Required: Intellec, 8086-based; 8089
Software Required: 8086 Monitor
Required: BLOCKS/98
Programming Language: PL/M-86. **Assembler/Compiler:** ISIS-II PL/M-86, V2.1
Media Availability (Price Code): DISKETTE (B), SRC; PAPER TAPE (P), SRC; SOURCE LISTING (L); DOCUMENTATION

BD16, CALCULATE: CHECKSUM

Submitted by: Diego Sanchez Hernandez, G.E.E., Electromedicina, Madrid, Spain

Abstract: This program calculates two verification digits for a data string until 1K bytes and types them out on the console output device.

Hardware Required: Intellec, 8080-based
Software Required: ISIS-II
Required: RAM/32K bytes; BLOCKS/28
Programming Language: Assembly. **Assembler/Compiler:** 8080/8085 Macro Assembler, V3.0
Libraries: SYSTEM.LIB
Media Availability (Price Code): DISKETTE (A), SRC, OBJ; PAPER TAPE (P), SRC; SOURCE LISTING (L)

BD17, TEST: PROM/ROM CHECKSUM SELF-TEST

Submitted by: W. Birthisel, Honeycomb Systems, Inc., Biddeford, Maine

Abstract: This program generates 24-bit sum of ROM contents and compares result with 3-byte signature. Unique sum for ROM spaces to 64K.

Hardware Required: Listing device
Software Required: Driver for listing device
Registers Modified: All. **Required:** RAM/none; ROM/74 sub 10; BLOCKS/24
Programming Language: Assembly. **Assembler/Compiler:** 8080/8085 Macro Assembler, V3.0
Libraries: SYSTEM.LIB
Media Availability (Price Code): DISKETTE (A), SRC, OBJ, ABS.OBJ; PAPER TAPE (P), SRC; SOURCE LISTING (L)

BD18, GENERATE: PROM CHECKSUM CALCULATION

Submitted by: John Hall, Eastman Kodak Co., Rochester, NY

Abstract: This program reads previously programmed PROMs, computes several different types of checksums, and allows the user to program the checksum value into an unprogrammed area in the PROM. Works only with 8-bit wide PROMs.

Hardware Required: Intellec Series-II 220/230/240; Universal PROM Programmer
Software Required: ISIS-II
Required: RAM/368OH to 45EDH; BLOCKS/477
Programming Language: PL/M. **Assembler/Compiler:** PL/M-80, V3.1
Media Availability (Price Code): DISKETTE (A), SRC, OBJ, ABS.OBJ; SOURCE LISTING (L); DOCUMENTATION

BD19, GENERATE: IBM BI-SYNC CRC16

Submitted by: Andy Belton, Tech-nel Data Products Limited, Brackley, England

Abstract: This subroutine generates IBM CRC16 check bytes using the polynomial: $X^{16} + X^{15} + X^2 + 1$.

Hardware Required: Intellec, 8048-based
Software Required: Calling program
Required: RAM/user defined; ROM/55 bytes; BLOCKS/23
Programming Language: ASM-48. **Assembler/Compiler:** MCS-48/UPI-41 Macro Assembler, V2.0
Media Availability (Price Code): DISKETTE (A), SRC; PAPER TAPE (P), SRC; SOURCE LISTING (L)

BD20, GENERATE: FAST GENERATION OF IBM BI-SYNC CRC16

Submited by: Paul Yeung, Cathay Pacific Airways Ltd., Hong Kong

Abstract: This routine does a fast computation of IBM BI-SYNC CRC16 on character basis uing the generating polynomial $X^{16} + X^{15} + X^2 + 1$. An interactive demonstration pogram is included.

Hardware Required: Series II or III (MDS-800 not supported)
Software Required: ISIS-II
Registers Modified: A, B, C, D, E, H, L. **Required:** RAM/user definable; ROM/44 bytes; BLOCKS/74
Programming Language: ASM-80. **Assembler/Compiler:** 8080/8085 Macro Assembler, V4.1
Libraries: SYSTEM.LIB
Media Availability (Price Code): DISKETTE (A), SRC, OBJ, ABS.OBJ; PAPER TAPE (P), SRC; SOURCE LISTING (L); DOCUMENTATION

BD21, DUMP: SYMBOL TABLE

Submitted by: Gary Carleton, Intel Corporation

Abstract: This program lists a symbol table of a located program, sorting alphanumerically or by address. Publics, local symbols and PL/M line numbers are included.

Hardware Required: Intellec, 8080 or 8085 based; Diskette Operating system
Software Required: ISIS-II
Registers Modified: All. **Required:** RAM/32K; BLOCKS/48
Programming Language: PL/M. **Assembler/Compiler:** PL/M-80, V3.0
Media Availability (Price Code): DISKETTE (B), OBJ; PAPER TAPE (P), HEX; DOCUMENTATION

BD22, SORT: SYMBOL TABLE FROM AN ABSOLUTE FILE

Submitted by: W. Marshall, Nordson, Amherst, OH

Abstract: This utility file produces a sorted symbol tabe from an absolute (linked and located) ISIS-II file.

Hardware Required: Intellec, 8080-based
Software Required: ISIS-II
Registers Modified: All. **Required:** RAM/40K; ROM/none; BLOCKS/101
Programming Language: PL/M. **Assembler/Compiler:** Pl/M-80, V3.0
Libraries: SYSTEM.LIB, PLM80.LIB
Media Availability (Price Code): DISKETTE (B), SRC, OBJ, ABS.OBJ; PAPER TAPE (P), SRC; SOURCE LISTING (L)

BD23, GENERATE: SYMBOL TABLE FOR BASIC-80

Submitted by: Andy Belton, Technel Data Products Ltd., Brackley, North End, U.K.

Abstrct: This program generates an X-Ref symbol table in ASCII format for a "BASIC" program.

Hardware Required: Intellec System; Diskette Operating System
Software Required: ISIS-II; BASIC-80
Required: BLOCKS/85
Programming Language: BASIC-80. **Assembler/Compiler:** BASIC-80, V1.1
Media Availability (Price Code): DISKETTE (B), SRC, LST; PAPER TAPE (P), SRC; SOURCE LISTING (L)

BD24, GENERATE: SYMBOL LIST

Submitted by: Kishor Raval, Technicon Corporation, Tarrytown, NY

Abstract: This program generates a composite, alphabetically arranged list of symbols used in a set of object modules, indicating the module in which each symbol appeared and whether it was public, external, or neither in the module. The list is saved on a disk file.

Hardware Required: Intellec with 64K memory and two disk drives
Software Required: ISIS-II
Required: BLOCKS/629
Programming Language: PL/M. **Assembler/Compiler:** PL/M-80, V3.0
Libraries: SYSTEM.LIB, PLM80.LIB
Media Availability (Price Code): DISKETTE (B), SRC, OBJ, LST, ABS.OBJ; SOURCE LISTING (L); DOCUMENTATION

BD25, GENERATE: PL/M CROSS REFERENCE

Submitted by: Douglas Kandle, Intel Corporation
Abstract: This program cross references symbols and numbers in multi-module programs.
Hardware Required: Series-III
Software Required: PL/M-86, NPEX, RUN,STOPIF
Registers Modified: None. **Required:** RAM/64K (will use more if available); ROM/none; BLOCKS/2940
Programmng Language: PL/M. **Assembler/Compiler:** PL/M-86, V1.0
Libraries: COMPAC.LIB
Media Availability (Price Code): DISKETTE (D), SRC, OBJ; SOURCE LISTING (L); DOCUMENTATION

BD26, DUMP: DISKETTE FILE

Submitted by: Stu Adler, Litton Energy Control, Chatsworth, CA
Abstract: This program dumps ISIS-II diskette files in hex and ASCII to the specified output device.
Hardware Required: Intellec, 8080-based; console device system
Software Required: ISIS-II
Required: BLOCKS/78
Programming Language: PL/M. **Assembler/Compiler:** PL/M-80, V3.0
Libraries: SYSTEM.LIB, PLM80.LIB
Media Availability (Price Code): DISKETTE (B), SRC, OBJ, ABS.OBJ; PAPER TAPE (P), SRC; SOURCE LISTING (L)

BD27, DUMP: DISKETTE

Submitted by: Carl Harcourt, Naval Avionics Center, Indianapolis, IN
Abstract: This program dumps diskette data on a block basis to specified output device in hex and ASCII format.
Hardware Required: Intellec, 8080-based; Diskette Operating System
Software Required: ISIS-II; monitor
Registers Modified: All. **Required:** RAM/32K; BLOCKS/93
Programming Language: Assembly. **Assembly/Compiler:** 8080/8085 Macro Assembler, V3.0
Libraries: SYSTEM.LIB
Media Availability (Price Code): DISKETTE (A), SRC, OBJ; PAPER TAPE (P), SRC; SOURCE LISTING (L)

BD28, DUMP: DISKETTE FILE

Submitted by: Garth Eaglesfield, Micro Focus Ltd., London, England
Abstract: This program dumps an ISIS-II diskette file to a speccified file in printable form. Hex, octal and ASCII representations are included.
Hardware Required: Intellec, 8080-based; Diskette Operating System; console device
Software Required: ISIS-II; MDS Monitor
Required: BLOCKS/92
Programming Language: Assembly. **Assembler/Compiler:** 8080/8085 Macro Assembler, V3.0
Libraries: SYSTEM.LIB
Media Availability (Price Code): DISKETTE (B), SRC; PAPER TAPE (P), SRC; SOURCE LISTING (L)

BD29, DUMP; iSBC 86/12 MEMORY

Submitted by: Paul Curley, C.S. Draper Lab., Inc., Cambridge, MA

Abstract: This program is a software debugging tool to be used with an iSBC 86/12. It allows memory locations with data stored in integer or floating point format to be output in decimal through the serial port, after which the program returns to the monitor.

Hardware Required: iSC 86/12 Memory, Development System
Software Required: SBC861 Loader, PLM86 and 86 Utiities
Registers Modified: All. **Required:** RAM/9831/469 (if program is put in ROM); ROM/N/A/9362 (if program is put in ROM)
Programming Language: PLM86. **Assembler/Compiler:** PLM86, V1.2
Media Availability (Price Code): DISKETTE (B), SRC, OBJ; PAPER TAPE (P); SOURCE LISTING (L); DOCUMENTATION

BD30, DUMP: iAPX-86/88 ABSOLUTE OBJECT FILE

Submitted by: John H. Hall, Eastman Kodak Co., Rochester, NY

Abstract: This program prints a formatted dump of iAPX-86/88 absolute object files to the console or to any ISIS-II device. It may be used to determine the name and position of all L-modules, T-modules, and overlays in an absolute object file, and is a useful tool when writing and debugging loaders for iAPX-86/88 systems.

Hardware Required: Intellec Series II or III
Software Required: ISIS-II
Registers Modified: All. **Required:** RAM/147EH; ROM/none; BLOCKS/1067
Programming Language: PL/M-80. **Assembler/Compiler:** PL/M-80.V4.0
Libraries: SYSTEM.LIB, PLM80.LIB
Media Availability (Price Code): DISKETTE (C), SRC, OBJ, LST, ABS.OBJ; SOURCE LISTING (L); DOCUMENTATION

BD31, EDIT: HEX FILE

Submitted by: Ben A. Harris, Techtran Industries, Rochester, NY

Abstract: This program provides modification facilities for hexadecimal diskette files. Patches in machine language may be made to located object files, thereby avoiding reassembling and relocating.

Hardware Required: Intellec, 8080-based
Software Required: ISIS-II
Required: RAM/1070 bytes; BLOCKS/133
Programming Language: Assembly. **Assembler/Compiler:** 8080/8085 Macro Assembler, V2.0
Media Availability (Price Code): DISKETTE (A), SRC; PAPER TAPE (P), SRC; SOURCE LISTING (L); DOCUMENTATION

BD32, EDIT: INSPECT AND CHANGE FILE

Submitted by: Dan Cody, Action Communication Systems, Inc., Dallas, TX

Abstract: This is a program allowing the user to display and modify data within a disk file, accessing each byte by its relative position in the file. Subroutines allow the user to write an ASCII/HEX dump of the specified data to a file and to copy specified binary data to a file.

Hardware Required: Intellec 230
Software Required: ISIS-II, V3.4 or later
Registers Modified: All. **Required:** RAM/3802; BLOCKS/245
Programming Language: PL/M. **Assembler/Compiler:** PL/M-80, V3.0
Libraries: SYSTEM.LIB, PLM80.LIB
Media Availability (Price Code): DISKETTE (B), SRC, OBJ, ABS.OBJ; SOURCE LISTING (L); DOCUMENTATION

BD33, EDIT: DISK

Submitted by: J. Broadhurst and J.J. Cooper, ICL, Winsford, Cheshire, England

Abstract: This program allows user to view blocks of data from a file, in both ASCII and HEX, and enables HEX input to any part of the file.

Hardware Required: Intellec, 8080/8085-based
Software Required: ISIS-II
Required: RAM/227 bytes; ROM/2060 bytes; BLOCKS/451
Programming Language: PL/M. **Assembler/Compiler:** PL/M-80, V3.1
Libraries: SYSTEM.LIB, PLM80.LIB
Media Availability (Price Code): DISKETTE (B), SRC, OBJ, ABS.OBJ; SOURCE LISTING (L); DOCUMENTATION

BD34, DEBUG: CAT88 (iRMX-88 TASK DEBUGGER)

Submitted by: Shivram Shetty, Eastman Kodak, Rochester, NY

Abstract: Console Aided Testing (CAT88) provides testing and interactive debugging for iRMX-88 V2.0 target application tasks. The user is provided with symbolic definitions for procedure names, literals, data buffers, and pattern definitions. It allows input and output commands to be executed from the console. Through extended address symbol definition, any routine can be invoked or any location can be displayed. During the Interactive Configuration Utility, the user is allowed to specify two options with regard to addressing and type of compilation; 1) Megabyte/Non Megabyte (version of the Nucleus); 2) Large or Compact option in compiling a PL/M-86 target module.

Hardware Required: iAPX-88 or 86-based system; ICE-86 or iSBC-957B for down-loading of application
Software Required: iRMX-88 V2.0 software (Nucleus and Terminal Handler using interrupt lines 4 and 5)
Registers Modified: All. **Required:** RAM/26K; ROM/none; BLOCKS/3659
Programming Language: PL/M-86; ASM-86. **Assembler/Compiler:** PL/M-86, V1.0; ASM-86, V1.0
Libraries: RMXMAX.LIB, TH088.LIB, TH188.LIB, 8087.LIB, DCON87.LIB
Media Availability (Price Code): DISKETTE (G), SRC, OBJ; DOCUMENTATION

BD35, GENERATE: HIGH AND LOW BYTES FROM 8086 HEX FILE

Submitted by: Hubert Maencher, Institut Fur Regelungstechnik, West Germany

Abstract: This program splits an absolute hex file containing 8086 code or data into its "high" and "low" bytes, storing those bytes with even addresses into one 8080-hex-format file and those with odd addresses into another, and writing a short address protocol to a third file.

Hardware Required: Intel or Siemens Development System with Disk Storage
Software Required: ISIS-II
Registers Modified: All. **Required:** RAM/At least 20K bytes; ROM/none; BLOCKS/243
Programming Language: PL/M-80. **Assembler/Compiler:** PL/M-80, V3.1
Libraries: PLM80.LIB, SYSTEM.LIB
Media Availability (Price Code): DISKETTE (B), SRC, OBJ; SOURCE LISTING (L); DOCUMENTATION

BD36, CONSOLE ACCESS: INPUT AND OUTPUT FOR SERIES-III

Submitted by: Ajit Deora, Intel Corporation

Abstract: This program makes access to conole input and output on the Series-III boards compatible with the Series-II boards of the Intellec MDS systems. The user could include these CI and CO routines as part of a library and call them as external functions/procedures in order to aid in easy debugging of 8080/8085 based PL/M-86 programs.

Hardware Required: Intellec Series-III
Software Required: ISIS-II; PL/M-86 (Series-III) for 8080/8085 based system
Registers Modified: All. **Required:** RAM/295 bytes; ROM/none; BLOCKS/96
Programming Language: PL/M-86. **Assembler/Compiler:** PL/M-86, V2.0
Libraries: LARGE.LIB
Media Availability (Price Code): DISKETTE (B), SRC, OBJ; PAPER TAPE (P), SRC; SOURCE LISTING (L); DOCUMENTATION

BD37, GENERATE: CCITT CYCLIC REDUNDANCY CHECK

Submitted by: Nha Nguyen, Intel Corporation

Abstract: This routine computes a CRC checksum using a 16-bit partial remainder generated by the CCITT polynominal $x^{16} + X^{12} + X^5 + 1$.

Hardware Required: 8080/8085-based
Software Required: ISIS-II
Registers Modified: All. **Required:** RAM/2 bytes; ROM/40 bytes; BLOCKS/36
Programming Language: ASM-80. **Assembler/Compiler:** 8080/8085 Macro Assembler, V4.1
Media Availability (Price Code): DISKETTE (A), SRC, OBJ; PAPER TAPE (P), SRC; SOURCE LISTING (L); DOCUMENTATION

BD38, GENERATE: PUBLIC SYMBOL CROSS REFERENCE

Submitted by: Daryl Raymond, Gilford Instrument Laboratories, Oberlin, OH

Abstract: This program sorts alphabetically and lists to a disk file public symbols from the object modules or libraries specified, together with the names of the modules in which they appear. The defining module for each symbol is identified as to segment type. Various control parameters support the listing of publics from specified library modules only, of publics from modules that satisfy unresolved externals only, etc. The number of multiply-defined symbols and unresolved externals is output to the console, and the associated module names are listed to a separate file.

Hardware Required: Intel Development System or NDS-I or NDS-II
Software Required: ISIS Operating System
Registers Modified: All. **Required:** RAM/64K; BLOCKS/2627
Programming Language: PL/M-80, ASM-80. **Assembler/Compiler:** PL/M-80, V3.1, 8080/8085 Macro Assembler, V4.1
Libraries: PLM80.LIB, SYSTEM.LIB
Media Availability (Price Code): DISKETTE (C), SRC, OBJ, ABS.OBJ; SOURCE LISTING (L); DOCUMENTATION

BD39, SORT: PUBLIC SYMBOLS

Submitted by: C.J. Audigier, Oxford Automation Ltd., Milton Keynes, England

Abstract: This program takes as input the public symbol table created by the PRINT and PUBLICS controls of the ISIS-II Locater and outputs the public symbols to a file in three adjacent columns: unsorted, sorted numerically by address, and alphabetically sorted.

Hardware Required: Intel Development System
Software Required: ISIS-II
Required: RAM/32K; BLOCKS/167
Programming Language: ASM-80. **Assembler/Compiler:** 8080/8085 Macro Assembler, V4.1
Libraries: SYSTEM.LIB
Media Availability (Price Code): DISKETTE (A), SRC, OBJ, ABS.OBJ; PAPER TAPE (P), SRC; SOURCE LISTING (L)

BD40, SIMULATE: iACX-96

Submitted by: D. Livshin and I. Beer, Intel Israel

Abstract: This program provides simulation and debugging facilities for object files produced by Intel's 8096 software development tools. Features include: symbolic debugging with high-level language support; single-step, line-step, and multiple-breakpoint simulation; memory and special registers display/change commands; save/restore simulation state; symbolic dissasembly; and extensible I/O simulation.

Hardware Required: Series-III with 128K RAM
Software Required: None
Required: RAM/128K; BLOCKS/1201
Programming Language: ASM-96 and PL/M-86. **Assembler/Compiler:** 8096 Assembler; Series-III PL/M-86
Libraries: COMPAC.LIB, PLM86.LIB
Media Availability (Price Code): DISKETTE (J); ABS.OBJ; DOCUMENTATION

PERIPHERAL APPLICATIONS

BE1, THERMOMETER: THERMISTOR CONTROLLER

Submitted by: Ray Simmons, L.A. Varah, Hamilton, Ontario, Canada

Abstract: This program converts termperature to a digital count. The count is used as an address pointer (to the temperature value stored). Temperature is displayed on the external display in Celsius degrees.

Hardware Required: SDK-85; Phillips Thermistor, 832001A1K3
Software Required: SDK-85 Monitor
Registers Modified: A, B, D, H, L, FLAGS. **Required:** RAM/none; ROM/512 bytes; BLOCKS/36
Programming Language: Assembly. **Assembler/Compiler:** 8080/8085 Macro Assembler, V2.0
Libraries: SYSTEM.LIB
Media Availability (Price Code): DISKETTE (A), SRC; PAPER TAPE (P), SRC; SOURCE LISTING (L)

BE2, HANDLER: RMX 80 MINIMAL TERMINAL

Submitted by: Thomas Rolander, San Jose, CA

Abstract: This program provides all the basic requirements for a terminal handler.

Hardware Required: iSBC 80/20
Software Required: RMX 80 Nucleus
Registers Modified: All. **Required:** RAM/67; ROM 570 bytes; BLOCKS/45
Programming Language: PL/M. **Assembler/Compiler:** PL/M-80, V3.0
Media Availability (Price Code): DISKETTE (A), SRC, OBJ, ABS.OBJ; SOURCE LISTING (L); DOCUMENTATION

BE3, READ: PAPER TAPE TO SDK-85 RAM

Submitted by: P. Bhanu Prasad, with contributions by R.S. Mahajan and S.K. Subramanyan, Central Electronics Engineering Research Institute, Pilani, India

Abstract: This program reads a paper tape from a TTY to SDK-85 RAM. The tape may be prepared by an SDK-80/85, an Intellec Development System, or may be in the form of a load address followed by hex and/or ASCII data.

Hardware Required: SDK-85; ASR-33 TTY
Software Required: SDK-85 monitor
Registers Modified: All. **Required:** RAM/3BH bytes; ROM/2K+062D hex bytes; BLOCKS/102
Programming Language: ASM-80. **Assembler/Compiler:** 8080/8085 Macro Assembler, V3.0
Media Availability (Price Code): DISKETTE (A), SRC, OBJ, ABS.OBJ; PAPER TAPE (P), SRC; SOURCE LISTING (L); DOCUMENTATION

BE4, PROGRAMMER; EPROMS 2708/16/32

Submitted by: Gerhard Trayser, Hospital of Geneva, Switzerland

Abstract: This program programs/reads/verifies 2708, 2716, and 2732 EPROMS from an MDS 230. It includes an automatic test for erased EPROM before programming.

Hardware Required: MDS 230; Parallel I/O card PGPIO
Software Required: ISIS-II
Required: BLOCKS/284
Programming Language: PL/M80. **Assembler/Compiler:** PL/M80, V3.1
Libraries: SYSTEM.LIB, PLM80.LIB
Media Availability (Price Code): DISKETTE (B), SRC, OBJ; SOURCE LISTING (L); DOCUMENTATION

BE5, PROGRAMMER: EPROM, 8755A

Submitted by: Max Jensen, Nordlsk Elektroakustic A/S, Lynge, Denmark

Abstract: This program has a routine to program an Intel 8755A EPROM and a routine to load the programmer via ICE-85 module. The programmer may read contents of EPROM back into the Intellec both before and after actual programming. A special section allows the programmer to execute a compare function between source program and EPROM. the program verifies after each step that programming has been effective.

Hardware Required: Intellec 220; ICE-85; SDK-85; programming interface
Software Required: ISIS-II; ICE-85 software
Registers Modified: All. **Required:** RAM/32K; BLLCKS/140
Programming Language: Assembly. **Assembler/Compiler:** 8080/8085 Macro Assembler, V3.0
Libraries: SYSTEM.LIB
Medial Availability (Price Code): DISKETTE (B), SRC, OBJ; PAPER TAPE (P), SRC; SOURCE LISTING (L); DOCUMENTATION

BE6, EXERCISE: DATA TRANSLATION MULTIBUS ANALOG I/O BOARDS

Submitted by: Dave Mabry, Chrysler Corporation, Highland Park, MI

Abstract: This program exercises a data translation I/O board from the 1700 or 1800 Series on a development system. It also provides PL/M callable routines that can be used in application systems.

Hardware Required: Intellec Model 800 or Series-II; data translation analog interface board
Software Required: ISIS-II
Registers Modified: All. **Required:** RAM/2165; ROM/none; BLOCKS/512
Programming Language: Assembly and PL/M. **Assembler/Compiler:** 8080/8085 Macro Assembler, V3.0; PL/M-80, V3.1
Libraries: SYSTEM.LIB, PLM80.LIB
Media Availability (Price Code): DISKETTE (A), SRC, OBJ, LST; SOURCE LISTING (L); DOCUMENTATION

BE7, DRIVER: PROM PROGRAMMER

Submitted by: James C. Follansbee, Desert Microsystems, Inc., Pasco, WA

Abstract: This program interfaces the data I/O system 17/19 PROM programmer with an Intellec 800. Serial interface utilizing iSBC 116 I/O Expansion Board.

Hardware Required: Intellec 800 System; serial I/O channel, iSBC 116, configured RS-232C
Software Required: ISIS-II, Monitor
Registers Modified: All. **Required:** RAM/32K bytes; ROM/none; BLOCKS/78
Programming Language: Assembly. **Assembler/Compiler:** 8080/8085 Macro Assembler, V3.0
Libraries: SYSTEM.LIB
Media Availability (Price Code): DISKETTE (B), SRC, OBJ; PAPER TAPE (P), SRC; SOURCE LISTING (L); DOCUMENTATION

BE8, COMMUNICATION: INTEL MDS — DATA I/O PROGRAMMER INTERFACE

Submitted by: D. Murdock, Syncronetics, Inc., Bellevue, Washington

Abstract: This interface program allows the Intel MDS to remotely control operation of the Data I/O Programmer. This program also includes basic data manipulation and editing capabilities for the MDS operator's use to prevent the need for several different programs during the software updating and device reprogramming.

Hardware Required: MDS Series II or III, DATA I/O Model 17, 19 or 20 with Computer Remote Control Software.
Software Required: ISIS 3.4 or newer.
Registers Modified: All. **Required:** RAM/317H + Buffer; ROM/2EB5H; BLOCKS/1301
Programming Language: PL/M. **Assembler/Compiler:** PL/M-80, V3.0
Libraries: SYSTEM.LIB, PLM80.LIB
Media Availability (Price Code): DISKETTE (F), SRC, OBJ, ABS.OBJ; DOCUMENTATION

RESIDENT TRANSLATORS

BF1, COMPILER: PASCAL

Submitted by: Thomas A. Rolander, Campbell, CA

Abstract: This program provides sequential PASCAL compiler and virtual machine implementation for an Intel 8080A-based Intellec.

Hardware Required: Intellec, 8080-based; Dual Diskette Operating System
Software Required: ISIS-II
Required: RAM/64K bytes; BLOCKS/3200 (on two diskettes)
Programming Language: PL/M
Media Availability (Price Code): DISKETTE (D), SRC, OBJ; DOCUMENTATION

BF2, INTERPRETER: PILOT-80

Submitted by: John Starkweather and Ron Williams, University of California

Abstract: PILOT is a programming system for controlling interactive conversations. It can be used as an author language for computer- assisted instructions. Designed to be simple in its syntax, PILOT allows those without prior computer experience to easily learn to control its features. Dialogue programs can be rapidly constructed and tested.

Hardware Required: Intellec, 8080-based
Software Required: ISIS-II
Registers Modified: All. **Required:** RAM/4K-72K editor and program requirements; BLOCKS/557
Programming Language: Assembly. **Assembler/Compiler:** 8080/8085 Macro Assembler, V2.0
Libraries: SYSTEM.LIB
Media Availability (Price Code): DISKETTE (C), SRC; SOURCE LISTING (L); DOCUMENTATION

BF3, INTERPRETER: LISP

Submitted by: Darrel J. Van Buer, Los Angeles, CA

Abstract: This program provides I/O of LISP data structures and interpretation of LISP expressions.

Hardware Required: Intellec Model 800
Software Required: Terminal I/O
Registers Modified: All. **Required:** RAM/32K; ROM/1731 bytes; BLOCKS/209
Programming Language: ASM-80. **Assembler/Compiler:** 8080/8085 Macro Assembler, V2.0
Media Availability (Price Code): DISKETTE (B), SRC; PAPER TAPE (P), SRC; SOURCE LISTING (L); DOCUMENTATION

BF4, ASSEMBLER: 8080 MACRO, V4.1

Submitted by: Intel Corporation

Abstract: This program assembles 8080 assembly language programs.

Hardware Required: Intellec, 8080-based
Software Required: Monitor
Registers Modified: All
Programming Language: PL/M
Media Availability (Price Code): SOURCE LISTING (L)

BF5, ASSEMBLER: ON-LINE

Submitted by: Bruce C. Wright, Duke Medical Center, Durham, NC

Abstract: This program allows instructions to be entered by mnemonics rather than absolute binary for experimental or debug purposes. Especially useful on small machines without much I/O capability.

Hardware Required: Intellec, 8080-based
Software Required: Monitor; terminal interface
Registers Modified: All. **Required:** ROM/1K bytes; BLOCKS/131
Programming Language: Assembly. **Assembler/Compiler:** 8080/8085 Macro Assembler, V3.0
Libraries: SYSTEM.LIB
Media Availability (Price Code): DISKETTE (B), SRC, OBJ; PAPER TAPE (P), SRC; SOURCE LISTING (L)

BF6, PROCESSOR: MACRO

Submitted by: Bruce W. Ravenel, Intel Corporation

Abstract: This program is a language-independent macro processor to be used to implement machine-independent software. It is suitable for use as a prepass for any language translator to provide macro capabilities.

Hardware Required: Intellec Model 800; Diskette Operating System
Software Required: ISIS-II
Required: RAM/48K minimum; BLOCKS/772
Programming Language: PL/M
Media Availability (Price Code): DISKETTE (B), SRC; DOCUMENTATION

BF7, INTERPRETER; LLL BASIC-II

Submitted by: Eugene Fisher, Lawrence Livermore Laboratory, Livermore, CA

Revised by: John W. Dickinson, John A. Teeter, and Karen Van Houten, University of Idaho

Abstract: This program is designed to operate with an 8080-based Intellec. This interpreter consists of an 8K-byte ROM-resident interpreter for program debug and generation.

Hardware Required: Intellec, 8080-based
Software Required: N/A
Registers Modified: All. **Required:** ROM/8K bytes; BLOCKS/2046
Programming Language: Assembly. **Assembler/Compiler:** 8080/8085 Macro Assembler, V2.0
Libraries: SYSTEM.LIB
Media Availability (Price Code): DISKETTE (D), SRC; SOURCE LISTING (L); DOCUMENTATION

BF8, INTERPRETER: LLL/CHERNACK BASIC

Submitted by: Charles Chernack, Consultant, Los Altos, CA

Hardware Required: Intellec, 8080-based
Software Required: ISIS-II
Required: RAM/32K bytes; BLOCKS/2008
Programming Language: Assembly. **Assembler/Compiler:** 8080/8085 Macro Assembler, V3.0
Libraries: SYSTEM.LIB
Media Availability (Price Code): DISKETTE (C), SRC, OBJ, LST, CSD; SOURCE LISTING (L); DOCUMENTATION

BF9, INTERPRETER: 8086/8088 TINY BASIC

Submitted by: Bob Glossman, Intel Corporation

Abstract: This program is a very small (less than 1K of code) BASIC interpreter allowing 26 variables and one array.

Hardware Required: Intellec, 8086-based; iSBC 86
Software Required: ISIS-II
Required: RAM/48K; BLOCKS/1040
Programming Language: Assembly. **Assembler/Compiler:** MCS-86 Assembler, X084
Media Availability (Price Code): DISKETTE (D), SRC, OBJ, LST; SOURCE LISTING (L); DOCUMENTATION

BF10, INTERPRETER: MCS-51 TINY BASIC, V2.2

Submitted by: Honore Bates, Intel Corporation

Abstract: This program provides a BASIC interpreter for the Intel MCS-51 family of single-chip microcontrollers. Provision is made for hexadecimal arithmetic, logical operations, and bit manipulation for microcontroller-oriented applications. Rudimentary system monitor capabilities are also provided.

Hardware Required: 8031 or 8751-with level shifters on serial I/O pins; CRT; PROM programming capabilities (External program and/or data memory may be added to develop and execute larger programs)
Software Required: None
Registers Modified: All. **Required:** RAM/User's option (128 bytes provided on 8051/8751; ROM/4K; BLOCKS/2313
Programming Language: ASM-51. **Assembler/Compiler:** MCS-51 Macro Assembler, V2.0
Media Availability (Price Code): DISKETTE (D), SRC, OBJ, LST, HEX; DOCUMENTATION

UTILITIES

BG1, LOAD/SAVE; RAM

Submitted by: Carl Harcourt, Naval Avionics Facility, Indianapolis, IN

Abstract: This program provides utilities to load/save ISIS files to/from memory.

Hardware Required: Intellec Model 800
Software Required: ISIS-I or ISIS-II; monitor
Registers Modified: All. **Required:** RAM/32K; BLOCKS/63
Programming Language: Assembly. **Assembler/Compiler:** 8080 Macro Assembler, V1.1
Media Availability (Price Code): DISKETTE (A), SRC; PAPER TAPE (P), SRC; SOURCE LISTING (L)

BG2, RECOVER: DISKETTE

Submitted by: c/o Intel Corporation

Abstract: This program permits recovery of files on an ISIS-formatted diskette whose directory file has been destroyed, but which is otherwise intact.

Hardware Required: Intellec Model 800
Software Required: ISIS-II
Registers Modified: All. **Required:** BLOCKS/36
Programming Language: PL/M. **Assembler/Compiler:** PL/M-80 or Cross PL/M Compiler
Media Availability (Price Code): DISKETTE (B), OBJ; PAPER TAPE (P), HEX; DOCUMENTATION

BG3, UTILITIES: CIRCULAR LISTS

Submitted by: George Woodley

Abstract: This program provides three utility subroutines: -Initialize; -Put, -Get.

Hardware Required: Intellec, 8080-based
Software Required: N/A
Required: RAM/211 bytes; BLOCKS/60
Programming Language: Assembly. **Assembler/Compiler:** 8080/8085 Macro Assembler, V3.0
Libraries: SYSTEM.LIB
Media Availability (Price Code): DISKETTE (B), SRC, OBJ; PAPER TAPE (P), SRC; SOURCE LISTING (L); DOCUMENTATION

BG4, INTERPRETER: RMX 80 COMMAND LINE

Submitted by: Ken Burgett, Dharma Systems, San Jose, CA

Abstract: This program provides operator control of RMX tasks, giving operator means to invoke a task via a console command. Several procedures are used to perform simple text handling and numerical processing.

Hardware Required: iSBC 80/20
Software Required: RMX 80 Nucleus; Free Space Manager Terminal Handler
Registers Modified: All. **Required:** RAM/46; ROM/988 bytes; BLOCKS/108
Programming Language: PL/M. **Assembler/Compiler:** PL/M-80, V3.0
Libraries: SYSTEM.LIB, PLM80.LIB
Media Availability (Price Code): DISKETTE (A), SRC, OBJ, ABS.OBJ; PAPER TAPE (P), SRC; SOURCE LISTING (L)

BG5, GENERATE: OUTPUT SIGNAL

Submitted by: Pentzlin, Informatik-Forum GMBH, Munchen, West Germany

Abstract: The intellec command SIGNAL outputs a visible signal (broad line) and an audible signal (two long beeps for CRT, several bells for TTY). If SIGNAL is the last command in a SUBMIT file, the user will hear when an execution of the SUBMIT file is finished, and can see it clearly even if he is too far from the console to read text.

Hardware Required: Intellec, Series-II
Software Required: ISIS-II
Required: RAM/1K bytes; BLOCKS/35
Programming Language: Assembly. **Assembler/Compiler:** 8080/8085 Macro Assembler, V3.0
Libraries: SYSTEM.LIB
Media Availability (Price Code): DISKETTE (A), SRC, OBJ; PAPER TAPE (P), SRC; SOURCE LISTING (L)

BG6, SUBMIT: ISIS COMMAND STRING

Submitted by: William J. Hinkle, Comtec Inc., Twinsburg, Ohio

Abstract: This "submit quick" program permits the operator to enter a string of ISIS commands separated by semicolons. The system is then controlled by these commands just as in an ordinary SUBMIT file, but without parameter substitution and without the necessity of creating (and later deleting) a CSD file.

Hardware Required: MDS-800 or Series-II
Software Required: ISIS-II
Registers Modified: All. **Required:** RAM/2285 bytes; ROM/none; BLOCKS/155
Programming Language: PL/M-80. **Assembler/Compiler:** PL/M-80, V3.1
Libraries: PLM80.LIB, SYSTEM.LIB
Media Availability (Price Code): DISKETTE (B), SRC, OBJ, ABS.OBJ, SOURCE LISTING (L); DOCUMENTATION

BG7, PROCEDURES: PL/M UTILITIES

Submitted by: c/o Intel Corporation

Abstract: This module consists of a group of utility procedures which ease file-oriented I/O under ISIS-II.

Hardware Required: Intellec, 8080-based; Diskette Operating System; console device
Software Required: ISIS-II
Required: RAM/380; ROM/656 bytes; BLOCKS/74
Programming Language: PL/M. **Assembler/Compiler:** PL/M-80, V3.0
Libraries: SYSTEM.LIB, PLM80.LIB
Media Availability (Price Code): DISKETTE (B), SRC, OBJ, ABS.OBJ; PAPER TAPE (P), SRC; SOURCE LISTING (L); DOCUMENTATION

BG8, PROCEDURES: PL/M OUTPUT

Submitted by: Karl Pentzlin, Informatik-Forum GmbH, Munchen, West Germany

Abstract: This program contains several procedures to be called by PL/M programs for formatted output of address/byte values or output of characters and strings.

Hardware Required: Intellec Model 800
Software Required: ISIS-II
Registers Modified: All. **Required:** RAM/206; ROM/2804 bytes; BLOCKS/131
Programming Language: PL/M. **Assembler/Compiler:** PL/M-80, V3.0
Libraries: SYSTEM.LIB, PLM80.LIB
Media Availability (Price Code): DISKETTE (B), SRC, OBJ, ABS.OBJ; PAPER TAPE (P), SRC; SOURCE LISTING (L)

BG9, PROCEDURE: PL/M DOCASE

Submitted by: Friedrich Laher, Siemens AG, Munchen, West Germany

Abstract: This procedure can be called in place of the PL/M-80 DOCASE statement. It calls a subroutine, so is more code efficient than DOCASE.

Hardware Required: 8080/8085
Software Required: PL/M-80
Required: BLOCKS/50
Programming Language: Assembly. **Assembler/Compiler:** 8080/8085 Macro Assembler, V3.0
Libraries: SYSTEM.LIB
Media Availability (Price Code): DISKETTE (A), SRC, OBJ; PAPER TAPE (P), SRC; SOURCE LISTING (L)

BG10, MACROS: BLOCK STRUCTURES

Submitted by: Stephen R. Wachtel, Georgia Institue of Technology, Atlanta, GA

Abstract: These block structured macros generate, for assembly language, commonly used control structures normally found in high-level languages.

Hardware Required: Intellec system
Software Required: ISIS-II
Programming Language: Assembly. **Assembler/Compiler:** 8080/8085 Macro Assembler, V3.0
Libraries: SYSTEM.LIB
Media Availability (Price Code): DISKETTE (C), SRC, OBJ, ABS.OBJ; SOURCE LISTING (L); DOCUMENTATION as part of source code

BG11, MACROS: BLOCK STRUCTURES

Submitted by: Steven R. Wachtel, Georgia Institute of Technology, Atlanta, GA

Abstract: This program generates commonly used control structures normally found in high-level languages for the Intel MCS-48 assembler. These macros enhance program development and documentation of routines that must be written in Assembly language because of execution speed or memory usage constraints.

Hardware Required: 8048
Software Required: ISIS-II
Required: BLOCKS/667
Programming Language: Assembly. **Assembler/Compiler:** MCS-48/UPI-41 Macro Assembler, V3.0
Media Availability (Price Code): DISKETTE (D), SRC, LST; SOURCE LISTING (L); DOCUMENTATION as part of Source Code

BG12, FIFO

Submitted by: Harry B. Steward, Neoteric, Los Gatos, CA

Abstract: This package provides complete support for the creation and management of any number of first-in first-out buffers, utilizing a rotary queueing mechanism for speed. There are 3 routines in this package: -FIFO initialization routine; -Get character from FIFO; -Put character to FIFO.

Hardware Required: Intellec 8080-based
Software Required: ISIS-II
Registers Modified: None. **Required:** RAM/user specified; ROM/72 bytes; BLOCKS/43
Programming Language: Assembly. **Assembler/Compiler:** 8080/8085 Macro Assembler, V3.0
Libraries: SYSTEM.LIB
Media Availability (Price Code): DISKETTE (C), SRC, OBJ; PAPER TAPE (P), SRC; SOURCE LISTING (L)

BG13, FIFO

Submitted by: Mervin Doda, Canadair Ltd., Montreal, Canada
Abstract: This program performs the function of first-in/first-out buffer. It consists of two subroutines: -Load; -Store.
Hardware Required: Intellec, 8080-based
Software Required: Monitor
Registers Modified: All. **Required:** RAM/259; ROM/118 bytes; BLOCKS/20
Programming Language: Assembly. **Assembler/Compiler:** 8080/8085 Macro Assembler, V3.0
Libraries: SYSTEM.LIB
Media Availability (Price Code): DISKETTE (B), SRC, OBJ; PAPER TAPE (P), SRC; SOURCE LISTING (L)

BG14, LIST/PRINT/TYPE

Submitted by: Brian Halla, Intel Corporation
Abstract: This program lists a file on the lineprinter, allowing for tab spacing.
Hardware Required: Intellec, 8080-based; Diskette Operating System; lineprinter
Software Required: ISIS-II
Required: RAM/32K; BLOCKS/40
Programming Language: Assembly. **Assembler/Compiler:** 8080/8085 Macro Assembler, V3.0
Libraries: SYSTEM.LIB
Media Availability (Price Code): DISKETTE (A), SRC, OBJ; PAPER TAPE (P), SRC; SOURCE LISTING (L)

BG15, LIST: FILE

Submitted by: R.C. Taylor, McMichael Limited, Slough, Berks., England
Abstract: This program enables any file to be listed on a VDU terminal. It will prompt for a return after writing a page of information.
Hardware Required: Intellec System; LSI ADM-3 VDU
Software Required: ISIS-II; monitor
Required: RAM/48K; ROM/none; BLOCKS/48
Programming Language: ASM-80. **Assembler/Compiler:** 8080/8085 Macro Assembler, V3.0
Libraries: SYSTEM.LIB
Media Availability (Price Code): DISKETTE (A), SRC, OBJ; PAPER TAPE (P), SRC; SOURCE LISTING (L)

BG16, LIST: FILE

Submitted by: Esko Lehtinen, AB Bofors, Bofors, Sweden
Abstract: This program provides for visual examination of a lengthy diskette file. The file is transferred, line by line, to the CRT console with tab characters replaced by spaces. The display can be frozen and the speed of output changed. Quick jumps of maximum 25600 characters can be specified, both forward and backward. After such a jump the CRT screen will be filled up with text and the display frozen.
Hardware Required: Intellec Model 800; Diskette Operating System
Software Required: ISIS-II; monitor console routines
Required: BLOCKS/60
Programming Language: Assembly. **Assembler/Compiler:** 8080 Macro Assembler, V1.1
Libraries: SYSTEM.LIB
Media Availability (Price Code): DISKETTE (A), SRC, OBJ; PAPER TAPE (P), SRC; SOURCE LISTING (L)

BG17, LIST: DISKETTE DIRECTORY

Submitted by: S. Bann, Xerox, El Segundo, CA

Abstract: This program outputs an alphabetized listing of a diskette to the lineprinter.

Hardware Required: Intellec, 8080 or 8085 based; Diskette Operating System
Software Required: ISIS-II; monitor
Registers Modified: A, F, B, C, D, E, H, I, SP, PC. **Required:** RAM/205 bytes; BLOCKS/40
Programming Language: Assembly. **Assembler/Compiler:** 8080/8085 Macro Assembler, V2.0
Libraries: SYSTEM.LIB
Media Availability (Price Code): DISKETTE (A), SRC, OBJ; PAPER TAPE (P), SRC; SOURCE LISTING (L)

BG18, LIST: DIRECTORY, ISIS DISKETTE/NDS DISK

Submitted by: Dave Mabry, Chrysler Corp., Detroit, Michigan

Abstract: This program outputs an alphabetized listing of an ISIS diskette directory or an NDS-II disk partition to the system console or printer. The new ISIS system call GETD is also used to print file size and attribute information if the directory is from an ISIS diskette.

Hardware Required: MDS-800, Series-II, or Series III with 64K bytes of RAM
Software Required: ISIS-II V4.2 or later or ISIS-III
Registers Modified: All. **Required:** RAM/6922 bytes; ROM/None; BLOCKS/212
Programming Language: PL/M-80, Assembly. **Assembler/Compiler:** PL/M-80, V3.1; 8080/8085 Macro Assembler, V4.0
Libraries: PLM80.LIB, SYSTEM.LIB
Media Availability (Price Code): DISKETTE (B), SRC, OBJ; SOURCE LISTING (L); DOCUMENTATION

BG19, SORT: DISK DIRECTORY

Submitted by: K. Sell, Posidata, Basingstoke, Hampshire, U.K.

Abstract: This program sorts an ISIS diskette directory.

Hardware Required: Intellec; Diskette Operating system
Software Required: ISIS-II, V2.2 or V3.4
Registers Modified: All, flags. **Required:** RAM/64K; ROM/none; BLOCKS/80
Programming Language: Assembly. **Assembler/Compiler:** 8080/8085 Macro Assembler, V3.0
Libraries: SYSTEM.LIB
Media Availability (Price Code): DISKETTE (A), SRC, OBJ; PAPER TAPE (P), SRC; SOURCE LISTING (L)

BG20, SORT; DISK DIRECTORY

Submitted by: Gary Gold, John Deere PEC, Waterloo, IA

Abstract: This program sorts a disk directory and displays it in alphanumeric order.

Hardware Required: Intellec Development System 230 or 800
Software Required: ISIS-II
Required: BLOCKS/262
Programming Language: PL/M-80. **Assembler/Compiler:** PL/M-80, V3.0
Libraries: SYSTEM.LIB, PLM80.LIB
Media Availability (Price Code): DISKETTE (A), SRC, OBJ; PAPER TAPE (P), SRC; SOURCE LISTING (L)

BG21, SORT: DISKETTE FILE

Submitted by: Andy Belton, Tech-Nel Data Products Limited, Brackley, England

Abstract: This routine sorts an ISIS disk file into ascending order. The file must contain fixed-length records, each containing a sort key. The calling structure is similar to an ISIS call, enabling the program to be added to SYSTEM.LIB and used as a utility program; or it could be adapted to allow calls from both ASM80 and PLM80.

Hardware Required: Intellec, 8080-based
Software Required: ISIS-II
Registers Modified: All. **Required:** RAM/705 bytes; ROM/none; BLOCKS/105
Programming Language: Assembly. **Assembler/Compiler:** 8080/8085 Macro Assembler, V3.0
Libraries: SYSTEM.LIB
Media Availability (Price Code): DISKETTE (A), SRC, OBJ; PAPER TAPE (P), SRC; SOURCE LISTING (L)

BG22, SORT: BUBBLE SORT AND BINARY SEARCH ROUTINES

Submitted by: Wade Noxon, Lucas Inc., Little Rock, Arkansas

Abstract: This program consists of routines to sort numerical input into an ascending array, conduct a binary search of a 512-element array, and to demonstrate these functions.

Hardware Required: 8080/8085 based with Disk Operating System
Software Required: ISIS-II
Required: BLOCKS/123
Programming Language: PL/M-80. **Assembler/Compiler:** PL/M-80, V3.1
Libraries: PLM80.LIB, SYSTEM.LIB
Media Availability (Price Code): DISKETTE (A), SRC, OBJ; SOURCE LISTING (L); DOCUMENTATION

BG23, INITIALIZE: BAUD RATE

Submitted by: Tom Wrenn, Dayton, Scientific, Inc., Dayton, OH

Abstract: This program initializes serial ports 1 and 2 for the Intellec 220/230. Baud rate, stop bits, parity, and word length are selected by operator control for both ports.

Hardware Required: Intellec 220/230
Software Required: ISIS-II
Registers Modified: All. **Required:** RAM/2K; ROM/2K; BLOCKS/75
Programming Language: Assembly. **Assembler/Compiler:** 8080/8085 Macro Assembler, V3.0
Libraries: SYSTEM.LIB
Media Availability (Price Code): DISKETTE (A), SRC, OBJ; PAPER TAPE (P), SRC; SOURCE LISTING (L); DOCUMENTATION

BG24, INITIALIZE: BAUD RATE

Submitted by: Jon Luckey, Imlac Corporation, Needham, MA

Abstract: This program sets baud rates on TTY0 and TTY1 of Intellec Model 230.

Hardware Required: Intellec with 8251/8253
Software Required: ISIS-II, calls, CI, CO, exit
Registers Modified: All. **Required:** RAM/650 bytes; BLOCKS/81
Programming Language: Assembly. **Assembler/Compiler:** 8080/8085 Macro Assembler, V3.0
Libraries: SYSTEM.LIB
Media Availability (Price Code): DISKETTE (A), SRC, OBJ, ABS.OBJ; SOURCE LISTING (L); DOCUMENTATION

BG25, BAUD RATE: MODIFY

Submitted by: Dave Mabry, Chrysler Corporation, Highland Park, MI

Abstract: This program takes input from the system console for the baud rate to be selected on serial ports 1 or 2 of an Intellec Series- II Microcomputer Development System. After setting the baud rate, it returns to ISIS.

Hardware Required: Series-II or Series-III with 32K bytes of RAM
Software Required: ISIS-II, V3.4 or later, or ISIS-III
Registers Modified: All. **Required:** RAM/758 bytes; ROM/none; BLOCKS/85
Programming Language: ASM-80. **Assembler/Compiler:** 8080/8085 Macro Assembler, V4.1
Media Availability (Price Code): DISKETTE (A), SRC, OBJ, ABS.OBJ; PAPER TAPE (P), SRC; SOURCE LISTING (L)

BG26, BAUD RATE: MODIFY UNDER CP/M

Submitted by: Dave Mabry, Chrysler Corporation, Highland Park, MI

Abstract: This program takes input from the system console for the baud rate to be selected on serial ports 1 or 2 of an Intellec Series-II Microcomputer Development System. The program is identical to Insite Program No. BG25, except that it has been modified to run under the CP/M-80 operating system.

Hardware Required: Series-II or Series-III with 32K bytes of RAM
Software Required: CP/M-80, V2.2 or later
Registers Modified: All. **Required:** RAM/590 bytes; ROM/none; BLOCKS/164
Programming Language: ASM. **Assembler/Compiler:** CP/M-80 ASM, V2.2
Media Availability (Price Code): DISKETTE (A), SRC, HEX, PRN, COM; SOURCE LISTING (L)

BG27, COPY; DISKETTE

Submitted by: Larry Malchodi, Boeing Comm., Airplane Co., Seattle, WA

Abstract: This program creates copies of floppy disks in three minutes with subroutines to: -Initialize disk to ISIS format; -Copy all data from disk drive 0 to drive 1; -Verify data on disk drive 1.

Hardware Required: Intellec system with 2 single density disk drives and console
Software Required: ISIS-II
Required: BLOCKS/72
Programming Language: Assembly. **Assembler/Compiler:** 8080/8085 Macro Asssembler, V3.0
Libraries: SYSTEM.LIB
Media Availability (Price Code): DISKETTE (A), SRC, OBJ, ABS.OBJ; SOURCE LISTING (L)

BG28, COPY: DISK

Submitted by: M.R. Bankston, UTL Corporation, Plano, TX

Abstract: This is a fast disk copy routine that formats, copies and verifies single or double density floppy disks on single or multiple drive systems (does not work with the integrated drive in the Intellec 220/225).

Hardware Required: Intellec Model 800/220/230 with 1 or more external disk drives; CRT console
Software Required: Monitor
Required: RAM/48K minimum; ROM/none; BLOCKS/143
Libraries: SYSTEM.LIB
Programming Language: ASM-80. **Assembler/Compiler:** 8080/8085 Macro Assembler, V3.0
Media Availability (Price Code): DISKETTE (A), SRC, OBJ, ABS.OBJ; SOURCE LISTING (L); DOCUMENTATION

BG29, CLOCK: REAL TIME

Submitted by: J.L. Marcel LaLonde, Agriculture Canada, Ottawa, Ontario

Abstract: This program contains three routines: -Initialize system RTC and store data/time; -Display date/time; -Service RTC interrupts.

Hardware Required: Intellec, 8080-based; system real-time clock
Software Required: ISIS-II, V2.2; monitor, V2.0
Registers Modified: All. **Required:** RAM/580 bytes; BLOCKS/45
Programming Language: Assembly. **Assembler/Compiler:** 8080/8085 Macro Assembler, V1.0
Media Availability (Price Code): DISKETTE (A), SRC; PAPER TAPE (P), SRC; SOURCE LISTING (L); DOCUMENTATION

BG30, CLOCK: 8748 CLOCK AND LCD TACHOMETER

Submitted by: Gary Heckendorn, Intel Corporation

Abstract: This program is designed to operate an 8748 and LCD as a 12 hour clock and a digital tachometer in either solid state ignition automobiles or point/condenser automobiles.

Hardware Required: As documented by schematic.
Software Required: ASM48
Required: ROM/an 8748; BLOCKS/55
Programming Language: Assembly. **Assembler/Compiler:** MCS-48/UPI-41 Macro Assembler, V3.0
Media Availability (Price Code): DISKETTE (A), SRC, OBJ, ABS.OBJ; SOURCE LISTING (L); DOCUMENTATION

BG31, CLOCK: MICRO/SYS MC1460 REAL TIME CLOCK BOARD UTILITIES

Submitted by: Wade Noxon, Lucas, Inc., Little Rock, Arkansas

Abstract: This program consists of utilities for the Micro/Sys MC1460 Real Time Clock Board under RMX-80, along with a demonstration program.

Hardware Required: Intellec 8080/8085 based; Micro/Sys MC1460 clock board
Software Required: ISIS-II; RMX-80
Required: BLOCKS/481
Programming Language: PL/M-80, Assembly. **Assembler/Compiler:** PL/M-80, V3.1; 8080/8085 Macro Assembler, V4.0
Libraries: PLM80.LIB, SYSTEM.LIB
Media Availability (Price Code): DISKETTE (A), SRC, OBJ, ABS.OBJ; SOURCE LISTING (L); DOCUMENTATION

BG32, PRINT: HIGH SPEED PRINT UTILITY

Submitted by: Kelly P. Golden, DuPont Instruments, Wilmington, DEL

Abstract: This program supports 3 types of printer interfaces for high speed printing: 1) Intellec Model 800 uses standard hardware and monitor, 2) Intellec Series II version uses standard hardware and monitor (if a special PCB is not installed); 3) Intellec Series II version uses special interface PCB and/or a special monitor. The routine is self assigning. Series II drivers are used if needed; the special PCB is used if present.

Hardware Required: See abstract
Software Required: see abstract
Required: RAM/64K bytes; BLOCKS/111
Programming Language: Assembly. **Assembler/Compiler:** 8080/8085 Macro Assembler, V3.0
Libraries: SYSTEM.LIB
Media Availability (Price Code): DISKETTE (A), SRC, OBJ; SOURCE LISTING (L); DOCUMENTATION as part of source code

BG33, CREDIT: USED ON MODIFIED HAZELTINE 1500

Submitted by: Joseph Abram, Consultant, Summer Hill, N.S.W., Australia

Abstract: This program is put into 2 2716 EPROMs in the Hazeltine 1500 and allows the use of the standard Intel CREDIT program, modifying some Hazeltine 1500 keys for use with CREDIT.

Hardware Required: Hazeltine 1500
Software Required: UPM
Required: ROM/2 2716s; BLOCKS/424
Programming Language: Assembly. **Assembler/Compiler:** 8080/8085 Macro Assembler, V3.0
Libraries: SYSTEM.LIB
Media Availability (Price Code): DISKETTE (B), SRC, OBJ, ABS.OBJ; SOURCE LISTING (L); DOCUMENTATION

BG34, PROCEDURES: PASCAL 86, SCREEN/CURSOR CONTROL

Submitted by: T. Schottle, EG&G Washington Analytical Services Center

Abstract: This program provides several Pascal procedures for screen control on the Series-III CRT. These procedures may be included in a program by use of the files and read commands of CREDIT.

Hardware Required: MDS Series-III
Software Required: Pascal-86
Registers Modified: None. **Required:** RAM/64K; ROM/none; BLOCKS/233
Programming Language: Pascal. **Assembler/Compiler:** Pascal-86, V1.0
Media Availability (Price Code): DISKETTE (C), SRC, OBJ; SOURCE LISTING (L); DOCUMENTATION

BG35, BIT HANDLING: 8048

Submitted by: K. Murai, Mitsubishi Heavy Industries, Nagoya, Japan

Abstract: This is a functional subroutine package to facilitate bit setting and resetting in registers.

Hardware Required: 8048
Software Required: None
Required: RAM/none; ROM/102 bytes; BLOCKS/32
Programming Language: Assembly. **Assembler/Compiler:** MCS-48/UPI-41 Macro Assembler, V2.0
Media Availability (Price Code): DISKETTE (A), SRC; PAPER TAPE (P), SRC; SOURCE LISTING (L)

BG36, LINKAGE: SERIES-III i8087 LINKAGE MODULES

Submitted by: Mike Silverstone, Brunswick Corporation, Costa Mesa, CA

Abstract: This program consists of modules which link the interrupt output of the i8087 Numeric Data Processor on an iSBC-337 Multimodule Math Board installed on a Series-III RPB-86 board to the Fortran-86 and Pascal-86 exception handlers and the RUN program's default math exception handler (ISIS-II RUN, V1.0 and 1.3, do not recognize the existence of an 8087 in the Intellec Series-III). Included are modules compatible with the PL/M-86 small, compact, medium, and large models of compilation.

Hardware Required: Series-III Development System; iSBC-337 Multimodule Math Board
Software Required: ISIS-II RUN 8086; any Series-III resident language translator or cross-translator; ASM-86
Registers Modified: All. **Required:** RAM/14 bytes; ROM/none; BLOCKS/130
Programming Language: ASM-86. **Assembler/Compiler:** 8086/8087/8088 Macro Assembler, V1.1
Media Availability (Price Code): DISKETTE (C), SRC, OBJ; SOURCE LISTING (L); DOCUMENTATION

BG37, BRANCH: MCS-48 BRANCH TABLE ROUTINE

Submitted by: Andy Belton, Tech-Nel Data Products Limited, England

Abstract: This routine performs a RELATIVE BRANCH, by adding an index in the ACCUMULATOR to the RETURN ADDRESS program counter. This routine is intended for large ON, GOTO type statements. Simple modifications ot the routine will enable other types to be implemented.

Hardware Required: 8048 Microcomputer
Software Required: ISIS-II, 8048 Assembler
Required: BLOCKS/30
Programming Language: Assembly. **Assembler/Compiler:** MCS-48/UPI-41 Macro Assembler, V4.0
Media Availability (Price Code): DISKETTE (B), SRC, HEX; PAPER TAPE (P), SRC; SOURCE LISTING (L); DOCUMENTATION

BG38, COMMANDS: META-PROGRAMS

Submitted by: Jim Kracht, Intel Corporation

Abstract: This PL/M-86 program subset will provide presentational and control aids to anyone writing a repeated, menu-selection command.

Hardware Required: Intellec Series III; Intel CRT
Software Required: ISIS-II; PL/M-86; LINK 86; COMPAC.LIB
Registers Modified: None. **Required:** RAM/depends on usage; ROM/none; BLOCKS/88
Programming Language: PL/M-86. **Assembler/Compiler:** PL/M-86, V2.0
Media Availability (Price Code): DISKETTE (B), SRC, OBJ; DOCUMENTATION

BG39, INCREMENT: PROGRAM COUNTER

Submitted by: Philip Weinstein, Hastings-On-Hudson, New York

Abstract: This program searches for the first occurrence or multiple occurrences of a character string within a file and increments the next integer it finds on the same line. It is most useful in SUBMIT control files for advancing program counters.

Hardware Required: Intellec 8085-based
Software Required: ISIS-II
Registers Modified: All. **Required:** RAM/3K; ROM/5K; BLOCKS/290
Programming Language: PL/M-80. **Assembler/Compiler:** PL/M-80, V3.1
Libraries: SYSTEM.LIB, PLM80.LIB
Media Availability (Price Code): DISKETTE (B), SRC, OBJ; SOURCE LISTING (L); DOCUMENTATON

BG40, COUNT: PROGRAM USAGE

Submitted by: Bernard J. Verreau, Intel Corporation

Abstract: This program, when linked to any 8080-based software, will keep a count of the number of times the program has been executed. It may be used to monitor program usage or to automatically delete a program after a given number of executions.

Hardware Required: Intel MDS
Software Required: PL/M-80, LINK, LOCATE, PLM80.LIB, SYSTEM.LIB
Registers Modified: All. **Required:** RAM/165 bytes; ROM/538 bytes; BLOCKS/118
Programming Language: PL/M-80. **Assembler/Compiler:** PL/M-80, V3.1
Media Availability (Price Code): DISKETTE (A), SRC, OBJ; PAPER TAPE (P), SRC; SOURCE LISTING (L); DOCUMENTATION

BG41, RELOCATE

Submitted by: Newell D. Sanders, Engineer, Fairview Park, OH

Abstract: This program permits loading and executing object programs at new addresses without reassembly. The relocate program changes address references in the object program during the first execution of the user's program. The relocate program is not called during subsequent executions of the user's program.

Hardware Required: Intellec 8080-based
Software Required: User's object program
Registers Modified: All restored. **Required:** RAM/36; ROM/none; BLOCKS/22
Programming Language: Assembly. **Assembler/Compiler:** 8080/8085 Macro Assembler, V3.0
Libraries: SYSTEM.LIB
Media Availability (Price Code): DISKETTE (B), SRC, OBJ; PAPER TAPE (P), SRC; SOURCE LISTING (L)

BG42, CHANGE: LOAD ADDRESSES, iAPX-86/88 OBJECT FILE

Submitted by: John H. Hall, Eastman Kodak Co., Rochester, NY

Abstract: This program changes the load addresses in an iAPX-86/88 absolute object file by a specified amount, allowing the code to be loaded at a different address from that at which it is to be executed. This is useful in multiprocessor environments, where the dual-port RAM of different processors is mapped into different Multibus addresses to avoid addressing conflicts.

Hardware Required: Intellec Series II or III
Software Required: ISIS-II
Registers Modified: All. **Required:** RAM/670H; ROM/none; BLOCKS/251
Programming Language: PL/M-80. **Assembler/Compiler:** PL/M-80.V4.0
Libraries: SYSTEM.LIB, PLM80.LIB
Media Availability (Price Code): DISKETTE (C), SRC, OBJ, ABS.OBJ; SOURCE LISTING (L); DOCUMENTATION

BG43, COPY: DISKETTE

Submitted by: J. Carr Taliaferro, S.A. Clark & Associates, Marion, Iowa

Abstract: This program does a track-by-track copy of a diskette from drive :F0: to :F1:, placing a user-supplied date (in the form mmddyy) and three-character extension in the label area of the copied diskette. The user is offered the option of copying subsequent diskettes with the same label.

Hardware Required: Intellec Series II; double density diskette drives (MDS-720) :F0: and :F1:
Software Required: None to execute; Software Toolbox libraries PFF.LIB and CUSP5.LIB to modify.
Registers Modified: All. **Required:** RAM/1993 bytes; ROM/none; BLOCKS/142
Programming Language: PL/M-80. **Assembler/Compiler:** PL/M-80, V4.0
Libraries: SYSTEM.LIB, PLM80.LIB, PFF.LIB, CUSP5.LIB
Media Availability (Price Code): DISKETTE (A), SRC, OBJ; PAPER TAPE (P), SRC; SOURCE LISTING (L); DOCUMENTATION

BG44, REPORT: STATUS OF EXPORTED JOB

Submitted by: Applications Engineering, Intel Corporation

Abstract: This program is an ISIS utility for use on a workstation of an NDS-II network system. It enables EXPORTed jobs to report progress to the user who exported the job.

Hardware Required: NDS-II workstation.
Software Required: None
Required: BLOCKS/77
Programming Language: PL/M-80. **Assembler/Compiler:** PL/M-80, V4.0
Libraries: SYSTEM.LIB, PLM80.LIB
Media Availability (Price Code): DISKETTE (A), SRC, OBJ, ABS.OBJ; PAPER TAPE (P), SRC; SOURCE LISTING (L); DOCUMENTATION

BG45, COPY iPDS CP/M-80 DISKETTE

Submitted by: Applications Engineering, Intel Corporation

Abstract: This program duplicates CP/M-80 formatted mini-diskettes on Intel's Personal Development System, informing the user beforehand of the number of disk swaps that will be necessary. It runs under the CP/M-80 operating system.

Hardware Required: iPDS
Software Required: iPDS CP/M-80
Required: BYTES/4K
Programming Language: PL/M-80, **Assembler/Compiler:** PL/M-80, V4.0
Media Availability (Price Code): DISKETTE (A), COM

MULTIFUNCTION MATH PACKAGES

CA1, MATH PACKAGE: FLOATING POINT

Submitted by: C.E. Ohme, Fremont, CA

Abstract: This 8008 binary floating point system contains subroutines for: -Addition; -Subtraction; -Multiplication; -Division; -Negation; -Absolute Value; -Test of floating point numbers.

Hardware Required: Intellec 8/MOD8; TTY: ASR-33
Software Required: Intellec 8/MOD8 Monitor, V1.0
Required: RAM/63; ROM/768 bytes; BLOCKS/437
Programming Language: Assembly. **Assembler/Compiler:** 8080 Macro Assembler, V1.0
Media Availability (Price Code): DISKETTE (A), SRC; SOURCE LISTING (L); DOCUMENTATION

CA2, MATH PACKAGE: FLOATING POINT

Submitted by: O.C. Juelich, Rockwell International Corp., Columbus, OH

Abstract: This math package contains routines to calculate: -Square Roots; -Sine/Cosine; -Logarithm; -Arc Tangent; -Exponential Function; -Hyperbolic Sine/Cosine

Hardware Required: Intellec 8/MOD8; TTY: ASR-33
Software Required: Intellec 8/MOD8 Monitor; Insite Ref. No. CA1
Registers Modified: All. **Required:** RAM/24; ROM/865 bytes; BLOCKS/641
Programming Language: Assembly. **Assembler/Compiler:** 8080 Macro Assembler, V1.0
Media Availability (Price Code): DISKETTE (A), SRC; SOURCE LISTING (L); DOCUMENTATION as part of the source listing.

CA3, MATH PACKAGE: PL/M MULTIPLE PRECISION

Submitted by: J. Hiley, Vector International, Haasrode, Belgium

Abstract: This multiple precision twos complement arithmetic package includes routines performing: -Addition; Subtraction; -Multiplication; -Division; -Decimal conversion.

Hardware Required: Intellec 8080-based
Software Required: Monitor
Registers Modified: All. **Required:** RAM/36 bytes; ROM/488 bytes; BLOCKS/94
Programming Language: Assembly. **Assembler/Compiler:** 8080/8085 Macro Assembler, V3.0
Libraries: SYSTEM.LIB
Media Availability (Price Code): DISKETTE (A), SRC, OBJ; PAPER TAPE (P), SRC; SOURCE LISTING (L)

CA4, MATH PACKAGE: DOUBLE PRECISION INTEGER

Submitted by: George Woodley, Nels Anderson, Woodley Associates, Danville, CA

Abstract: This math package contains routines performing: -Computation of sine/cosine of an angle; -Normilization of a 16-bit integer; -Division of a 32-bit integer by a 16-bit divisor to yield a 16-bit quotient; -Multiplication of a 16-bit integer for a 32-bit result.

Hardware Required: Intellec 8080-based
Software Required: Monitor
Registers Modified: All. **Required:** RAM/30; ROM/581 bytes; BLOCKS/153
Programming Language: Assembly. **Assembler/Compiler:** 8080/8085 Macro Assembler, V3.0
Libraries: SYSTEM.LIB
Media Availability (Price Code): DISKETTE (A), SRC, OBJ; PAPER TAPE (P), SRC; SOURCE LISTING (L); DOCUMENTATION

CA5, MATH PACKAGE: FIXED AND FLOATING POINT

Submitted by: Charles B. Falconer, Yale University, New Haven, CT

Abstract: This math package contains routines performing fixed and floating point arithmetic functions, together with a demonstration program that performs algebraic evaluation (from left to right, with no operator precedence) and allows unlimited parentheses nesting.

Hardware Required: Intellec 8080-based
Software Required: Monitor
Required: RAM/100 bytes; BLOCKS/317
Programming Language: Assembly. **Assembler/Compiler:** 8080/8085 Macro Assember, V2.0
Libraries: SYSTEM.LIB
Media Availability (Price Code): DISKETTE (A), SRC; SOURCE LISTING (L)

CA6, MATH PACKAGE: FLOATING POINT

Submitted by: Dr. Keith J. Caserta, Proctor and Gamble Company, Cincinnati, OH

Abstract: This math package contains routines performing: -Addition; -Subtraction; -Multiplication; -Division; -Negation; -BCD conversion.

Hardware Required: Intellec 8080-based
Software Required: Monitor; calling program
Registers Modified: All. **Required:** RAM/21; ROM/767 bytes; BLOCKS/122
Programming Language: Assembly. **Assembler/Compiler:** 8080/8085 Macro Assember, V3.0
Libraries: SYSTEM.LIB
Media Availability (Price Code): DISKETTE (A), SRC, OBJ; PAPER TAPE (P), SRC; SOURCE LISTING (L)

CA7, MATH PACKAGE: FLOATING POINT

Submitted by: Richard Allen, Texas Microsystems, Inc., Houston, TX

Abstract: This program is a floating point math system, providing the user with the equivalent of a full floating point instruction set for 8080 programs. Includes relocatable routines performing: -Addition; -Subtraction; -Multiplication; -Division; -Negation; -Absolute value; -Trigonometric function; -Integer/Fractional part; -Square root; -Log base E; -Exponential, E↑X; -Log base 10; -10↑X; -Real base to real exponent A↑X; -Frig SIN, COS, and TAN, ARCSIN, ARCCOS, and ARCTAN; -Polynominal Expander; -Degrees <- -> Radian conversions

Hardware Required: Intellec 8080-based
Software Required: ISIS-II
Required: BLOCKS/1971
Programming Language: Assembly. **Assembler/Compiler:** 8080/8085 Macro Assembler, V2.0
Libraries: SYSTEM.LIB
Media Availability (Price Code): DISKETTE (D), SRC; SOURCE LISTING (L); DOCUMENTATION

CA8, MATH PACKAGE: FLOATING POINT UTILITIES FOR FPAL.LIB

Submitted by: James C. Follansbee, J.F. Microsystems, Pasco, WA (additional documentation and file by Kelly P. Golden, DuPont Instruments)

Abstract: iSBC 310 floating point system for use with single or multiple iSBC 80/20 processors. Interfaces CPU board with high-speed math board, SBC-310. Software is compatible with FPAL.LIB and may be used at the same time by the iSBC 80/20. Soft math is then done using FPAL, hard math using FFPAL and iSBC 310. This package contains utilities performing: -Conversion of FAC to/from BCD; -Log functions (Natural, Common, Base 2 of FAC); -Antilog (base E, 10 and 2 of FAC); -Power raising; -Exchange of operator/operand; -System initialization for function operation.

Hardware Required: iSBC 310; at least one iSBC 80/20; Multibus cardcage
Software Required: iSBC 80/20 Monitor, FPAL.LIB
Required: RAM and ROM/function dependent; BLOCKS/365
Programming Language: Assembly. **Assembler/Compiler:** 8080/8085 Macro Assembler, V2.0
Libraries: SYSTEM.LIB, FPAL.LIB, FPALX.LIB (included on diskette)
Media Availability (Price Code): DISKETTE (A), SRC; SOURCE LISTING (L); DOCUMENTATION

CA9, MATH PACKAGE: OPTIMIZED FLOATING POINT

Submitted by: c/o Intel Corporation

Abstract: This math package contains the following routines: -Addition; -Subtraction; -Multiplication; -Division; -Squaring; -Square root; -Negation; -Float a 16-bit 2s complement integer; -PL/M interfacing; -Floating point convert.

Hardware Required: Intellec system iSBC 80/10
Software Required: ISIS-II
Required: RAM/35; ROM/1206 bytes; BLOCKS/335
Programming Language: Assembly and PL/M. **Assembler/Compiler:** 8080/8085 Macro Assembler, V3.0; PL/M-80, V3.0
Libraries: SYSTEM.LIB, PLM80.LIB
Media Availability (Price Code): DISKETTE (B), SRC, SOURCE LISTING (L)

CA10, MATH PACKAGE: OPTIMIZED FLOATING POINT

Submitted by: S.N. Cope and S.E. Evans, Oxford University, Oxford, England

Abstract: This math package contains routines that perform floating point arithmetic functions: -Addition; -Subtraction; -Multiplication; -Division; -Squaring of numbers; -Square root (16-bit mantissa, 8-bit exponent). All routines are highly optimized using the minimum storage space for the highest speed.

Hardware Required: iSBC 80/10 or similar
Software Required: iSBC 80/10 P monitor or similar
Registers Modified: All. **Required:** RAM 1byte + stack; ROM/1055; BLOCKS/217
Programming Language: Assembly. **Assembler/Compiler:** 8080 Macro Assembler, V1.1
Media Availability (Price Code): DISKETTE (A), SRC; SOURCE LISTING (L); DOCUMENTATION

CA11, MATH PACKAGE: ARITHMETIC FUNCTIONS

Submitted by: D. Holden, Miltope, Plainville, MA

Abstract: This math package contains routines performing multiple-precision arithmetic operations supporting, in memory-to-memory format: -Addition; -Twos complement; -Subtraction; -Shift left/right; -Multiplication; -Value set to 0; -Division

Hardware Required: Any MCS-48 microprocessor
Software Required: N/A
Registers Modified: A, R0, R1, R2, R3, R4. **Required:** RAM/4 x data precision; ROM/150; BLOCKS/73
Programming Language: Assembly (8048). **Assembler/Compiler:** MCS-48/UPI-41 Macro Assembly, V2.0
Media Availability (Price Code): DISKETTE (C), SRC; PAPER TAPE (P), SRC; SOURCE LISTING (L); DOCUMENTATION

CA12, MATH PACKAGE: DOUBLE PRECISION FLOATING POINT

Submitted by: Larry Brookwell and M. Master, University of Ottawa, Ottawa, Ontario

Abstract: This math package expands FPAL.LIB to include double precision functions. It also works with Insite Order No. CA13.

Hardware Required: Intellec 8080-based; Diskette Operating System
Software Required: ISIS-II; FPAL.LIB
Required: BLOCKS/672
Programming Language: Assembly. **Assembler/Compiler:** N/A
Media Availability (Price Code): DISKETTE (B), SRC; SOURCE LISTING (L); DOCUMENTATION

CA13, MATH PACKAGE: 8086 FLOATING POINT LIBRARY

Submitted by: Intel Corporation

Abstract: This single-precision math package for the 8086 is identical to FPAL.LIB for the 8085 in its functions. Your PL/M-80 program can be recompiled using PL/M-86 with no changes needed for the calls to FPAL (however, the program may not be located above 64K in memory).

Hardware Required: Intellec 8086-based
Software Required: MDS-311 8086 Software Support Package
Registers Modified: All. **Required:** RAM/6811 bytes; BLOCKS/147
Programming Language: PL/M
Media Availability (Price Code): DISKETTE (B), OBJ

CA14, MATH PACKAGE: 8086 MULTIPLE PRECISION ARITHMETIC

Submitted by: c/o Intel Corporation

Abstract: This math package includes 28 PL/M-86 callable procedures performing double-precision arithmetic functions and submit files for program set-up.

Hardware Required: Intellec 8086-based
Software Required: N/A
Required: BLOCKS/394
Programming Language: Assembly. **Assembler/Compiler:** MCS-86 Macro Assembler, V2.0
Media Availability (Price Code): DISKETTE (B), SRC; SOURCE LISTING (L); DOCUMENTATION

CA15, MATH PACKAGE: MULTIPLY/DIVIDE

Submitted by: Ken Bartlette, Acurex Corporation

Abstract: This math package contains two subroutines: -Multiplication of two 24-bit binary numbers yielding a 48-bit result; -Division of a 48-bit binary integer by a 24-bit binary integer.

Hardware Required: Intellec 8080-based
Software Required: N/A
Required: RAM/12 bytes; ROM/259 bytes; BLOCKS/43
Libraries: SYSTEM.LIB
Media Availability (Price Code): DISKETTE (A), SRC, OBJ; PAPER TAPE (P), SRC; SOURCE LISTING (L)

CA16, MATH PACKAGE: 8231 ARITHMETIC PROCESSING UNIT

Submitted by: Marty Goldberg/Dale D. Mull, Hunterlab, Reston, VA

Abstract: This package provides a floating point software driver for the Intel 8231 or AMD 9511 arithmetic processing unit. Subroutines include numerous functions: -Addition; -Subtraction; -Multiplication; -Division; -Absolute value; -Change sign; -Square; -Square root; -Test for zero and minus; -Arctangent; -Cube root; -Raise to N power; -Logarithm; -Convert floating point to/from ASCII; -Convert radians to/from degrees; -Calculates sine/cosine/tagent/angle in radians, Hyperbolic sine/cosine/tangent.

Hardware Required: Intel 8231 or AMD 9511 APU
Software Required: N/A
Registers Modified: All. **Required:** RAM/21 bytes; ROM/1104 bytes; BLOCKS/102
Programming Language: Assembly. **Assembler/Compiler:** 8080/8085 Macro Assembler, V3.0
Libraries: SYSTEM.LIB
Media Availability (Price Code): DISKETTE (D), SRC, OBJ; PAPER TAPE (P), SRC; SOURCE LISTING (L); DOCUMENTATION

CA17, MATH PACKAGE: 8231

Submitted by: Ron Economos, Honeycomb Systems, Inc., Biddeford, MN

Abstract: This program converts numeric data (entered from a keyboard; 30H subtracted and stored in memory) stored in a memory buffer to 8231 compatible floating point data. Converts floating point to ASCII-30H and stores it in same memory buffer. Also, implements all 8231 math functions.

Hardware Required: 80/24 single board computer with SBX 331 multimodule
Software Required: None
Registers Modified: All. **Required:** RAM/41 bytes; ROM/1730 bytes; BLOCKS/90
Programming Language: Assembly. **Assembler/Compiler:** 8080 MDS Macro Assembler, V1.0
Media Availability (Price Code): DISKETTE (C), SRC, OBJ; PAPER TAPE (P), SRC; SOURCE LISTING (L)

CA18, MATH PACKAGE: 8051

Submitted by: Terry Steeden, FSI Corporation, Chaska, MN

Abstract: This program provides the four basic math functions, using packed BCD numbers. All four of the BCD math routines use the same registers for the initial data and answer.

Hardware Required: 8031-3, or any family member
Software Required: ASM51
Registers Modified: ACC, DPTR, R0, R1, R2. **Assembler/Compiler:** RAM/2AH-5FH, data memory; ROM/226H any place in code; BLOCKS/363.
Programming Language: Assembly. **Assembler/Compiler:** ASM-51, V2.0
Media Availability (Price Code): DISKETTE (B), SRC, OBJ, PAPER TAPE (P), SRC; SOURCE LISTING (L); DOCUMENTATION

CA19, MATH PACKAGE: RECURSIVE COMPUTATION OF MEAN AND STANDARD DEVIATION

Submitted by: Jan Duits, SKF Engineering and Research Center, The Netherlands

Abstract: The input to this program module is a statistical structure in which parameters are passed, and results and intermediate data are stored. All routines are fully reentrant and are not using any fixed variable RAM area.

Hardware Required: 8080/8085-based system
Software Required: PL/M-80, FPAL.LIB
Required: BLOCKS/63
Programming Language: PL/M-80. **Assembler/Compiler:** PL/M-80, V3.1
Libraries: FPAL.LIB
Media Availability (Price Code): DISKETTE (C), SRC, OBJ; PAPER TAPE (P), SRC; SOURCE LISTING (L); DOCUMENTATION

CA20, MATH PACKAGE: 8080/8085 FUNDAMENTAL SUPPORT PACKAGE (FSP)

Submitted by: Intel Corporation

Abstract: The Fundamental Support Package (FSP) is a set of application subroutines and functions a user can call from their 8080/8085 ASSEMBLY LANGUAGE, PL/M-80, or FORTRAN-80 programs. It offers a standard set of data structures and unified status and error reporting scheme. All FSP routines are reentrant and come in relocatable object form. The routines and functions provided are:

—The FSP MACHINE package performs fast string handling, binary and decimal integer arithmetic without error reporting.

—The BINARY INTEGER ARITHMETIC routines provide operations on signed and unsigned integers of various formats in binary representation.

—The FLOATING-POINT ARITHMETIC sections provide operations on floating-point (real) numbers in four formats: single precision, single precision extended, double precision, and double precision extended.

—The DECIMAL ARITHMETIC routines provide integer and fix-point arithmetic on numbers in decimal representation stored as strings of ASCII characters.

—The STRING HANDLING section contains routines to transform strings and to extract and insert substrings. A routine for scanning of general input and one for formatting of general output are included.

—The routines for NUMBER CONVERSION AND NUMERIC I/O do transformation of numeric data from one internal format to another, input scanning of numeric strings and formatting of numeric strings for output.

—The FLOATING-POINT TRANSCENDENTAL FUNCTION section provides trigonometric exponential, and other transcendental function for single precision, single precision extended, double precision, and double precision extended floating-point arguments.

—The STATISTICS routines compute the mean, variance, and standard deviation of one group of statistical data, and the covariance and correlation factor of two groups of data.

—The P.I.D. PROCESS CONTROL routines direct the production of an appropriate output signal in response to an input signal, using a formula with proportional, integral, and/or derivative terms, for real-time process control applications.

Hardware Required: 8080/8085-based system
Software Required: ISIS-II, LINK, LOCATE
Programming Language: 8080/8085 Assembly, PL/M-80, FORTRAN-80
Assembler/Compiler: 8080/8085 Macro Assembler, V4.0, PL/M-80, V3.1 or FORTRAN-80, V2.1
Libraries: PLM80.LIB and/or F80RUN.LIB, F801SS.LIB, FPEF.LIB, FPA.LIB
Media Availability (Price Code): DISKETTE (L), OBJ; DOCUMENTATION (EXTENSIVE)
*THE FSP IS NOT SUPPORTED BY INTEL CORPORATION OR BY THE INSITE™ LIBRARY.

CA21, MATH PACKAGE: HIGH-SPEED BINARY MATH PACKAGE FOR 8031/8051

Submitted by: Bruce M. Estes and Terry T. Steeden, FSI Corporation, Chaska, MN

Abstract: This program provides routines which perform the four basic math functions on binary numbers up to 3 bytes (24 places) in length. Answers are 3 bytes for addition and subtraction and 6 bytes for multiplication and division.

Hardware Required: 8031 or 8051
Software Required: 8051 Assembler
Registers Modified: Accumulator, B, PSW. **Required:** RAM/02H-0FH; ROM/168H; BLOCKS/63
Programming Language: ASM-51. **Assembler/Compiler:** MCS-51 Macro Assembler, V2.0
Media Availability (Price Code): DISKETTE (B), SRC, OBJ; PAPER TAPE (P), SRC; SOURCE LISTING (L); DOCUMENTATION

CA22, MATH PACKAGE: ARITHMETIC FUNCTIONS FOR MCS-48

Submitted by: Microcomputer Division, KLT Konsult AB, Växjö, Sweden

Abstract: This math package contains routines performing the four basic math functions on 24-bit operands, yielding 24-bit results. Other routines calculate square root from a 24-bit value, set a value to zero, and shift left/right one bit.

Hardware Required: MCS-48 based
Software Required: None
Registers Modified: R2-R7. **Required:** ROM/338 bytes; BLOCKS/127
Programming Language: ASM-48. **Assembler/Compiler:** MCS-48/UPI-41 Macro Assembler, V4.2
Media Availability (Price Code): DISKETTE (B), SRC, HEX; PAPER TAPE (P), SRC; SOURCE LISTING (L); DOCUMENTATION

CA23, GENERATE: STOCHASTIC VARIATES AND HISTOGRAMS

Submitted by: Olga Varalli, Bioteco S.P.A., Milan, Italy

Abstract: This program: 1) generates pseudo-random numbers in the range $1 \div (2^{32} - 1)$; 2) generates normally distributed variates, with a given expected value and standard deviation, in the range $0 \div (2^{32} - 1)$; 3) produces a histogram array, operating on binary integer data, four bytes long; and 4) prints the current histogram array.

Hardware Required: Intellec Series II; lineprinter
Software Required: FSP Machine routines of Fundamental Support Package (Insite Order No. CA20); print routine to output ASCII string to desired device
Required: RAM/DDH; ROM/50AH; BLOCKS/139
Programming Language: PL/M-80. **Assembler/Compiler:** PL/M-80, V3.1
Libraries: SYSTEM.LIB, PLM80.LIB
Media Availability (Price Code): DISKETTE (B), SRC, OBJ; PAPER TAPE (P), SRC; SOURCE LISTING (L); DOCUMENTATION

ONE FUNCTION MATH ROUTINES

CB1, TRANSFORM: DISCRETE FOURIER

Submitted by: Louis Gilles Durand, Insitut de Recherches, Montreal, Quebec

Abstract: This program implements forward and inverse Fourier transform of a complex data vector. This subroutine executes an in-place, decimation-in-time, radix 2, Fast Fourier Transform algorithm originally written in FORTRAN by Cooley, Lewis and Welch.

Hardware Required: Intellec 8/MOD80
Software Required: Intellec 8/MOD80 Monitor; Insite Ref. Nos. CA1, CA2
Registers Modified: All. **Required:** RAM/517; ROM/887 bytes; BLOCKS/68
Programming Language: Assembly. **Assembler/Compiler:** 8080/8085 Macro Assembler, V3.0
Libraries: SYSTEM.LIB
Media Availability (Price Code): DISKETTE (A), SRC, OBJ; PAPER TAPE (P), SRC; SOURCE LISTING (L); DOCUMENTATION

CB2, GENERATE 16-BIT RANDOM NUMBER

Submitted by: Vito A. Trujillo, Zot Manufacturing Co., Lakewood, CO

Abstract: This subroutine generates a 16-bit random number ranging from 0000 to FFFF with a period less than or equivalent to 2 * * 16. An 8-bit random number is available as the upper byte of the 16-bit random number.

Hardware Required: Intellec 8/MOD80; TTY: ASR-33
Software Required: Intellec 8/MOD80 Monitor
Registers Modified: None. **Required:** RAM/42 bytes; BLOCKS/17
Programming Language: Assembly. **Assembler/Compiler:** 8080/8085 Macro Assembler, V3.0
Libraries: SYSTEM.LIB
Media Availability (Price Code): DISKETTE (A), SRC, OBJ; PAPER TAPE (P), SRC; SOURCE LISTING (L)

CB3, CALCULATION: LEAST SQUARES QUADRATIC FITTING

Submitted by: Dr. Keith J. Caserta, Proctor and Gamble Co., Cincinnati, OH

Abstract: This routine performs summations and matrix manipulation for fitting up to 256 floating point X-Y pairs to a function of the form:

$$aX^2 + bX + c = Y$$

Hardware Required: Intellec 8080-based
Software Required: Monitor; Insite program Ref. No. CA5
Registers Modified: All. **Required:** RAM/2359; ROM/1380 bytes; BLOCKS/71
Programming Language: Assembly. **Assembler/Compiler:** 8080/8085 Macro Assembler, V3.0
Libraries: SYSTEM.LIB
Media Availability (Price Code): DISKETTE (A), SRC, OBJ; PAPER TAPE (P), SRC; SOURCE LISTING (L)

CB4, CALCULATION: NATURAL LOGARITHM

Submitted by: B. Hauert, Battelle Institute, Geneva, Switzerland

Abstract: This routine computes the natural logarithm of a number betweeen 1 and 65535.

Hardware Required: Intellec 8080-based
Software Required: Monitor
Registers Modified: PSW, H, L. **Required:** RAM/4; ROM/148 bytes; BLOCKS/17
Programming Language: Assembly. **Assembler/Compiler:** 8080 Macro Assembler, V1.0
Media Availability (Price Code): DISKETTE (A), SRC; PAPER TAPE (P), SRC; SOURCE LISTING (L); DOCUMENTATION

CB5, CALCULATE: SQUARE ROOT

Submitted by: c/o Intel Corporation

Abstract: This routine generates an 8-bit square root of a 16-bit number.

Hardware Required: Intellec 8048-based
Software Required: N/A
Required: RAM/4; ROM/96 bytes; BLOCKS/20
Programming Language: Assembly. **Assembler/Compiler:** MCS-48/UPI-41 Macro Assembler, V2.0
Media Availability (Price Code): DISKETTE (A), SRC; PAPER TAPE (P), SRC; SOURCE LISTING (L)

CB6, GENERATE: RANDOM NUMBER

Submitted by: K. K. Christian Knudsen, Data Industri, Oslo, Norway

Abstract: This program generates uniform random numbers between 0 and user specified limit. A multiplicative congruential method, based on overflow, is used.

Hardware Required: Intellec 8080-based
Software Required: Monitor
Required: RAM/251 bytes; BLOCKS/16
Programming Language: PL/M.
Media Availability (Price Code): DISKETTE (A), SRC; PAPER TAPE (P), SRC; SOURCE LISTING (L); DOCUMENTATION

CB7, GENERATE: GRAPH

Submitted by: Fernando Jordan, IPT — AIA, Sao Paulo, Brazil

Abstract: This program plots up to 100 coordinates on the TTY (or console device), using 64 columns by 64 lines. All coordinates must be integer, positive, from 0 to 1023.

Hardware Required: Intellec Model 800; TTY
Software Required: Monitor, V2.0; Division Routine; BCD to binary conversion routine
Required: RAM/16K bytes; BLOCKS/36
Programming Language: Assembly. **Assembler/Compiler:** 8080/8085 Macro Assembler, V3.0
Libraries: SYSTEM.LIB
Media Availability (Price Code): DISKETTE (A), SRC, OBJ; PAPER TAPE (P), SRC; SOURCE LISTING (L); DOCUMENTATION

CB8, GENERATE: HISTOGRAM

Submitted by: R.A. Mikkelson, System Services, West Los Angeles, CA

Abstract: This program will plot a histogram graph of numeric data between the limits of 00 to 100. It may be useful for graphical analysis distributions, signal quality, probability or any function which requires analysis of incidence of data.

Hardware Required: Intellec-8080 based; TTY or lineprinter
Software Required: N/A
Registers Modified: All. **Required:** RAM/389; BLOCKS/31
Programming Language: Assembly. **Assembler/Compiler:** Microkit Assembler, V1.0
Media Availability (Price Code): DISKETTE (A), SRC; PAPER TAPE (P), SRC; SOURCE LISTING (L)

CB9, GENERATE: X-Y GRAPH

Submitted by: Bernie Verreau, Intel Corporation

Abstract: This program plots any expression consisting of constants, arithmetic operations, functions. The variable X may be evaluated over a specified range of X, and the resulting values are plotted on an X-Y coordinate map.

Hardware Required: iSBC-86/12A or Series-II with 64K RAM, MDS or Hazeltine 1510 terminal
Software Required: Monitor
Registers Modified: All. **Required:** RAM/64K; ROM/none; BLOCKS/380
Programming Language: PL/M. **Assembler/Compiler:** PL/M-86, V1.0
Libraries: DCON87.LIB, CEL.LIB, 8087.LIB, EH87.LIB, 87NULL.LIB, E8087.LIB
Media Availability (Price Code): DISKETTE (D), SRC, OBJ; SOURCE LISTING (L); DOCUMENTATION

CB10, MULTIPLICATION: 8748 BCD

Submitted by: Karl-Magnus Heinrichs, Vaaka-Nyholm, Helsinki, Finland

Abstract: This routine performs multiplication between a 6-digit and a 4-digit BCD value. The result is 10-digit.

Hardware Required: PROMPT-48
Software Required: PROMPT-48 Monitor
Registers Modified: R0 to R7 and R12 to R16. **Required:** ROM/61 bytes; BLOCKS/19
Programming Language: Assembly. **Assembler/Compiler:** MCS-48/UPI-41 Macro Assembler, V2.0
Media Availability (Price Code): DISKETTE (A), SRC; PAPER TAPE (P), SRC; SOURCE LISTING (L)

CB11, ADD AND SUBTRACT: BCD NUMBERS

Submitted by: Yoram Hirsch, Lebow Associates, Troy, MI

Abstract: These are subroutines which can be used in application programs in which the data is in BCD form. BCD numbers of any length can be added or subtracted, with sign.

Hardware Required: Any MCS-48 Processor
Software Required: None
Registers Modified: R0, R1, R2, R4. **Required:** RAM/N + 2; ROM/100 bytes; BLOCKS/38
Programming Language: Assembly. **Assembler/Compiler:** MCS-48/UPI-41 Macro Assembler, V3.0
Media Availability (Price Code): DISKETTE (A), SRC, OBJ; PAPER TAPE (P), SRC; SOURCE LISTING (L)

CB12, DIVISION: 32-BIT BY 16-BIT

Submitted by: Fred Lee, UCLA. Los Angeles, CA

Abstract: This program divides a 32-bit number by a 16-bit number and gives a 16-bit quotient along with a 16-bit remainder while requiring no RAM allocated for intermediate variables. All parameters are transferred through registers. All numbers are in twos complement representation.

Hardware Required: 8080/8085
Software Required: N/A
Registers Modified: All. **Required:** RAM/6 bytes of stack; ROM/86 bytes; BLOCKS/34
Programming Language: Assembly. **Assembler/Compiler:** 8080/8085 Macro Assembler, V3.0
Libraries: SYSTEM.LIB
Media Availability (Price Code): DISKETTE (A), SRC, OBJ; PAPER TAPE (P), SRC; SOURCE LISTING (L)

CB13, CALCULATE: SINE OR COSINE ROUTINE

Submitted by: Roy Wien, EDO Corporation, Wichita, KS

Abstract: This routine returns the SINE or COSINE of a 16-bit number.

Hardware Required: 8048 Microcomputer
Software Required: ISIS-II
Registers Modified: R0, R1, R2, R3, R4, R6, R7. **Required:** RAM/2 bytes plus registers; ROM/151D; BLOCKS/28
Programming Language: ASM-48. **Assembler/Compiler:** MCS-48/UPI-41 Macro Assembler, V4.0
Media Availability (Price Code): DISKETTE (B), SRC, HEX; PAPER TAPE (P); SOURCE LISTING (L); DOCUMENTATION

CB14, MULTIPLICATION: 40-BIT

Submitted by: Glenn Godden, World Wide Weighing, Inc., Bellevue, WA

Abstract: This routine will perform multiplication of a 20-bit BINARY number, yielding a 40-bit result.

Hardware Required: Applicable 8048 or 8049 target system
Software Required: N/A
Registers Modified: R0, R1, R2, R3, R4, R5, R6, R7. **Required:** RAM/25 bytes (DECIMAL): ROM/102 bytes (DECIMAL); BLOCKS/106
Programming Language: ASM-48. **Assembler/Compiler:** MCS-48/UPI-41 Macro Assembler, V4.0
Media Availability (Price Code): DISKETTE (B), SRC, HEX; SOURCE LISTING (L); DOCUMENTATION

GAMES

D1, GAME: MAZE

Submitted by: C. Vincent Phillips, Alkon Corporation, Columbus, OH

Abstract: This program generates random mazes and prints them on the specified list device.

Hardware Required: Intellec 8080-based
Software Required: Monitor
Registers Modified: All. **Required:** RAM/2492 bytes; BLOCKS/72
Programming Language: Assembly. **Assembler/Compiler:** 8080/8085 Macro Assembler, V2.0
Media Availability (Price Code): DISKETTE (A), SRC; PAPER TAPE (P), SRC; SOURCE LISTING (L)

D2, GAME: MAZE

Submitted by: Dalibor Nemec, Praha-4, Michle, Czech.

Abstract: In this game a "mouse" makes its way through an invisible maze, mapping the maze when it bumps against the wall. The fewer bumps and steps, the higher the score.

Hardware Required: Intellec Model 800; Console Device: Mini Bee or Intel CRT
Software Required: Monitor
Registers Modified: All. **Required:** RAM/3.2K bytes; BLOCKS/82
Programming Language: PL/M. **Assembler/Compiler:** PL/M-80, V3.0
Libraries: SYSTEM.LIB, PLM80.LIB
Media Availability (Price Code): DISKETTE (A), SRC; PAPER TAPE (P), SRC; SOURCE LISTING (L)

D3, GAME: BANDIT

Submitted by: P.G.R. Kitson, Marconi Radar Systems Ltd., New Parks, Leicester, England

Abstract: This game is a simulation of a one-armed bandit (slot machine). A static display on the VDU screen is produced.

Hardware Required: Intellec Model 800, CRT: Hazeltine 1200
Software Required: Monitor
Registers Modified: All. **Required:** RAM/2386 bytes; BLOCKS/85
Programming Language: Assembly. **Assembler/Compiler:** 8080 Macro Assembler, V1.1
Media Availability (Price Code): DISKETTE (A), SRC; PAPER TAPE (P), SRC; SOURCE LISTING (L)

D4, GAME: FRUIT MACHINE

Submitted by: Andy Belton, Tech-nel Data Products, Ltd., Brackley, England

Abstract: This game simulates a fruit machine (one-armed bandit).

Hardware Required: Intellec Series-II
Software Required: Monitor
Required: RAM/1.1K bytes; BLOCKS/158
Programming Language: Assembly. **Assembler/Compiler:** 8080/8085 Macro Assembler, V2.0
Media Availability (Price Code): DISKETTE (A), SRC; PAPER TAPE (P), SRC; SOURCE LISTING (L)

D5, GAME: CRAPS

Submitted by: Van Herndon and Dave Yonich, J.M. Perry Institute, Yakima, WA

Abstract: This game simulates a dice game of chance.

Hardware Required: SDK-80
Software Required: SDK-80 Monitor
Registers Modified: All. **Required:** RAM/20; ROM 1K bytes; BLOCKS/42
Programming Language: Assembly. **Assembler/Compiler:** 8080 Macro Assembler, V1.1
Media Availability (Price Code): DISKETTE (A), SRC; PAPER TAPE (P), SRC; SOURCE LISTING (L)

D6, GAME: DARTS

Submitted by: Gerard L. Dooley, Plessey Radar Limited, Liverpool, England

Abstract: This game is a game of darts for two players. The dart board is displayed on the VDU. Throws are made by depressing a character on the concole.

Hardware Required: Intellec 8080-based; CRT
Software Required: Monitor
Registers Modified: All. **Required:** RAM/32; ROM1K bytes; BLOCKS/98
Programming Language: Assembly. **Assembler/Compiler:** 8080 Macro Assembler, V1.1
Media Availability (Price Code): DISKETTE (A), SRC; PAPER TAPE (P), SRC; SOURCE LISTING (L)

D7, GAME: HANGMAN

Submitted by: Bernard J. Verreau, NCR Corporation, Millsboro, DL

Abstract: This game is a word guessing game. The image of a gallows is constructed on the CRT, and the secret word appears as underlined blanks underneath. The player enters his guess on the keyboard. A wrong guess causes a part to be added to the picture of the hanged man. The object of the game is to guess the word before the picture is completed.

Hardware Required: Intellec Model 800; CRT: Beehive Mini B-2 or Hazeline 1510
Software Required: Monitor, V2.0
Registers Modified: All. **Required:** RAM/734 bytes; BLOCKS/52
Programming Language: Assembly. **Assembler/Compiler:** 8080 Macro Assembler, V1.1
Libraries: SYSTEM.LIB
Media Availability (Price Code): DISKETTE (A), SRC; PAPER TAPE (P), SRC; SOURCE LISTING (L)

D8, GAME: SLALOM, V1.4

Submitted by: Ulrich E. Sporri, UES Electronics & Software, Stallikon, Switzerland

Abstract: This game simulates the Swiss Ski Championship World Cup

Hardware Required: Intellec 8080-based
Software Required: ISIS-II
Required: RAM/10K bytes; BLOCKS/182
Programming Language: PL/M **Assembler/Compiler:** PL/M-80,V3.1
Libraries: SYSTEM.LIB, PLM80.LIB
Media Availability (Price Code): DISKETTE (A), SRC, OBJ; PAPER TAPE (P), SRC; SOURCE LISTING (L)

D9, GAME: MASTERMIND

Submitted by: c/o Intel Corporation

Abstract: This is a game of logic to be played on an SDK-86 and will be useful to SDK-86 users as examples of how to code 8086 programs. There are two versions of the program: -One is wrtten in ASM86; -One is written in PL/M-86. You get both.

Hardware Required: SDK-86
Software Required: PLM86 or ASM86, LINK86, LOC86, OH86, SDK86, SDKIOS.LIB
Registers Modified: All. **Required:** RAM/5K bytes; BLOCKS/96
Programming Language: PL/M or Assembly. **Assembler/Compiler:** MCS-86 Assembler, V1.0 or PL/M-86, V1.1
Media Availability (Price Code): DISKETTE (A), SRC; PAPER TAPE (P), SRC; SOURCE LISTING (L); DOCUMENTATION

D10, GAME: OTHELLO

Submitted by: P.J. Agius, Avery-Hardoll Ltd., Havant, Hamphsire, England

Abstract: The computer plays the game of Othello with the operator.

Hardware Required: Intellec; CRT; lineprinter
Software Required: ISIS-II
Registers Modified: All. **Required:** RAM/4912 bytes; BLOCKS/339
Programming Language: PL/M. **Assembler/Compiler:** PL/M-80, V3.0
Libraries: SYSTEM.LIB, PLM80.LIB
Media Availability (Price Code): DISKETTE (A), SRC, OBJ; PAPER TAPE (P), SRC; SOURCE LISTING (L)

D11, GENERATE: MUSIC FOR THE SDK-85

Submitted by: John Luis Beaven, Madrid, Spain

Abstract: This program produces musical tones which can be configured to reproduce a piece of music. The speaker is energized using the 20mA current loop output of the SDK-85.

Hardware Required: SDK-85; speaker, resistor, and capacitor (amplifier optional)
Software Required: Delay routine from Monitor
Required: RAM/37 bytes; BLOCKS/70
Programming Language: Assembly. **Assembler/Compiler:** 8080/8085 Macro Assembler, V3.0
Media Availability (Price Code): DISKETTE (A), SRC, LST; PAPER TAPE (P), SRC; SOURCE LISTING (L); DOCUMENTATION

D12, GAME: TINY CHESS 86

Submitted by: Jan Kuipers, Intel International, Belgium

Abstract: This program plays chess against the user or against itself. Includes en passant, castling, pawn promotion.

Hardware Required: Intellec system; SDK-86 with 4K bytes of RAM + download cable
Software Required: ISIS and SDK-86 (download program) + SDK-86 Monitor
Registers Modified: All. **Required:** RAM/4K bytes; ROM/none; BLOCKS/1306
Programming Language: Assembly. **Assembler/Compiler:** MCS-86 Assembler, X038
Media Availability (Price Code): DISKETTE (A), SRC, OBJ, HEX, LST, ABS.OBJ; SOURCE LISTING (L); DOCUMENTATION

D13, GAME: BREAKOUT

Submitted by: Philip Weinstein, Hastings-On—Hudson, NY

Abstract: This is a version of the popular "BREAKOUT" video game. The object is to break through a wall of bricks using a bouncing ball and a paddle. Three ball speeds can be selected.

Hardware Required: Intellec Series II or III
Software Required: ISIS-II
Registers Modified: All. **Required:** RAM/3K; ROM/none; BLOCKS/251
Programming Language: PL/M-80. **Assembler/Compiler:** PL/M-80, V3.1
Libraries: SYSTEM.LIB, PLM80.LIB
Media Availability (Price Code): DISKETTE (A), SRC, OBJ, ABS.OBJ; PAPER TAPE (P), SRC; SOURCE LISTING (L); DOCUMENTATION

D14, GAME: POKER

Submitted by: Matt Townsend, Intel Corporation

Abstract: This program plays a very good, generally conservative game of five-card draw poker. The computer will bet, raise, bluff, fold, and occasionally heckle the user.

Hardware Required: Series II or III
Software Required: BASIC-80, V1.1
Required: BLOCKS/238
Programming Language: BASIC-80. **Assembler/Compiler:** BASIC-80, V1.1
Media Availability (Price Code): DISKETTE (A), SRC, OBJ; SOURCE LISTING (L)

D15, GAME: BLACK BOX

Submitted by: Ross Morgan, Intel Corporation

Abstract: The aim of this game is to locate five invisible balls hidden in an 8X8 matrix by probing the matrix from the sides, using probe balls that the player rolls in.

Hardware Required: Microcomputer Development System with Series II, Beehive, Hazeltine, or Omron terminal
Software Required: ISIS-II
Required: BLOCKS/1059
Programming Language: PL/M-80 and ASM-80. **Assembler/Compiler:** PL/M-80, V4.0; 8080/8085 Macro Assembler, V4.1
Libraries: PLM80.LIB, SYSTEM.LIB
Media Availability (Price Code): DISKETTE (A), SRC, OBJ, LST, ABS.OBJ; SOURCE LISTING (L)

TRAINING/TUTORIAL

E1, SOURCE FILES: iAPX-86/88 SYSTEM WORKSHOP SUMMARY AND REVIEW*

Submitted by: Charles Chernack, Los Altos, CA

Abstract: This diskette contains source files of demonstration programs and laboratory exercises from the iAPX-86/88 System Workshop Summary and Review (manual supplied with diskette).

Hardware Required: Series-III Development System; SDK-86; ICE-86
Software Required: ISIS-II
Required: BLOCKS/436
Programming Language: ASM-86; PL/M-86. **Assembler/Compiler:** MCS-86 Assembler, V1.0; Series-III PL/M-86, V2.0
Media Availability (Price Code): DISKETTE (D), SRC; DOCUMENTATION

E2, SOURCE FILES: MCS-80/85 SYSTEM WORKSHOP SUMMARY AND REVIEW*

Submitted by: Charles Chernack, Los Altos, CA

Abstract: This diskette contains source files of demonstration programs and laboratory exercises for the MCS-80/85 System Workshop Summary and Review (manual supplied with diskette).

Hardware Required: Series-II Development System; light-switch box
Software Required: ISIS-II
Required: BLOCKS/894
Programming Language: ASM-80; PL/M-80. **Assembler/Compiler:** 8080/8085 Macro Assembler, V4.0; PL/M-80, V3.1
Libraries: SYSTEM.LIB, PLM80.LIB
Media Availability (Price Code): DISKETTE (C), SRC; DOCUMENTATION

E3, MORSE CODE TUTOR VER. 2.0

Submitted by: Hans Georg Giese, West Germany

Abstract: This program is a complete Morse code tutorial with 10 lessons and 4 pages of text.

Hardware Required: 8035 processor
Software Required: None
Registers Modified: None. **Required:** RAM/none, ROM 1K if no test, else up to 4K
Programming Language: Assembly. **Assembler/Compiler:** MCS-48 Macro Assembler, V4.0
Media Availability (Price Code): DISKETTE (A), SRC, HEX; PAPER TAPE (P), SRC; SOURCE LISTING (L); DOCUMENTATION

E4, UTILITIES: TALK

Submitted by: Bernard J. Verreau, Intel Corporation

Abstract: This program is designed to return a predefined word or phrase in response to an input query. Individual replies are defined by first typing the input phrase and then the desired output. A variety of applications are possible, including language translation, information retrieval, and tutorials. A very compact data storage technique allows quick access to as many as 8000 different phrases in a 64K system.

Hardware Required: 8080/8085-based system
Software Required: Standard ISIS system software
Registers Modified: All. **Required:** RAM/16K minimum; ROM/1.2K; BLOCKS/839
Programming Language: Assembly **Assembler/Compiler:** 8080/8085 Macro Assembler, V3.0
Libraries: SYSTEM.LIB
Media Availability (Price Code): DISKETTE (C), SRC, ABS.OBJ, SOURCE LISTING (L); DOCUMENTATION

E5, UTILITIES: MENU

Submitted by: Dror Caspi and Ilan Spillinger, Technion, I.I.T., Haifa, Israel

Abstract: This program is intended to enable the novice Series II or Series III user to invoke various ISIS-II system commands and related programs, simply by means of choosing from a 'menu' (and sub-menus) of options. The program quizzes the user for any necessary parameters, then constructs, displays, and executes the ISIS command.

Hardware Required: Intel Development System with 64K and Series II or III keyboard and CRT
Software Required: ISIS-II; Intel Software Toolbox program CONSOL
Registers Modified: All. **Required:** RAM/64K; ROM/none; BLOCKS/3612
Programming Language: PL/M-80. **Assembler/Compiler:** PL/M-80, V3.1
Libraries: SYSTEM.LIB, PLM80.LIB
Media Availability (Price Code): DISKETTE (B), SRC, OBJ, ABS.OBJ; DOCUMENTATION

E6, CREDIT: TUTORIAL

Submitted by: Leonard Kaufer, Intel Corporation

Abstract: This is an easy four-lesson tutorial for users of Intel's CREDIT text editor. It begins with simple screen mode commands and advances to the various command mode features, including Find, Substitute, Block Copy and Block Move, command iteration, etc.

Hardware Required: Intel Development System
Software Required: ISIS-II; CREDIT
Registers Modified: None. **Required:** RAM/none; ROM/none; BLOCKS/307
Programming Language: None; ASCII text files to be CREDITed
Media Availability (Price Code): DISKETTE (B), TEXT; DOCUMENTATION

Appendix

INSITE™ USER'S PROGRAM LIBRARY

MEMBERSHIP FORM

I WISH TO BECOME A MEMBER OF INSITE. ENCLOSED IS:

- ☐ CHECK/MONEY ORDER
- ☐ PURCHASE ORDER
- ☐ PROGRAM SUBMITTAL

MEMBER NAME: _____

COMPANY: _____

ADDRESS: _____

_____

_____

TELEPHONE: _____

REFER TO THE INSITE PRICE LIST FOR ANNUAL MEMBERSHIP FEE.

RETURN COMPLETED FORM TO THE NEAREST INSITE OFFICE:

NORTH AMERICA
Intel Corporation
3065 Bowers Avenue
Santa Clara, California 95051
ATTN: Insite User's Program Library
Telephone: 408-987-8080

THE ORIENT
Intel Japan K.K.
5-6 Tohkohdai, Toyosato-cho,
Tsukuba-gun, Ibaraki, 300-26, Japan
ATTN: Insite User's Program Library
Telephone: 029747-8511

EUROPE

Intel Corporation S.A.R.L.
5 Place de la Balance
Silic 223
94528 Rungis Cedex, France
ATTN: Insite User's Program Library
Telephone: 0687-22-21

Intel Semiconductor GmbH
Seidlstrasse 27
8000 Muenchen 2
West Germany
ATTN: Insite User's Program Library
Telephone: 089-5389-1

Intel Corporation (U.K.) Ltd.
Pipers Way
Swindon SN3 LRJ
Wiltshire, England
ATTN: Insite User's Program Library
Telephone: 0793-488-388

MAILING LABEL: (please print) PURCHASE ORDER NO. _____

NAME _____ COMPANY _____

STREET _____

CITY _____ STATE _____ ZIP _____

INSITE™ USER'S PROGRAM LIBRARY PROGRAM ORDER FORM

P.O. NO. # _____

Please include information on BOTH address blocks. AMOUNT ENCLOSED $ _____

ADDRESS: (please print) Membership Information

NAME _____ COMPANY _____

STREET _____ PHONE NO. _____

CITY _____ STATE _____

PLEASE CHECK: ☐ Paper Tape ☐ Double Density Diskette ☐ Single Density Diskette ☐ Listing
☐ ISIS ☐ CP/M

ORDER NO.	TITLE

INSITE™ USER'S PROGRAM LIBRARY SUBMITTAL FORM

Processor

☐ 8048 ☐ 8051 ☐ 8080/8085 ☐ 8086/8087/8088 ☐ Other _____

Indicate the MDS series model the program was created on by checking the appropriate box, and identify other MDS series models the program may be compatible with.

Program Title

Function

Required Hardware

Required Software

Input Parameters

Output Results

Registers Modified:	**Programmer:**
RAM Required:	**Company:**
ROM Required:	**Address:**
Maximum Subroutine Nesting Level:	**City:**
Assembler/Compiler Used:	**State:**
Programming Language:	**Telephone:**

ACKNOWLEDGEMENT AND AGREEMENT

To the best of my knowledge, I have the right to contribute this program material without breaching any obligation concerning nondisclosure of proprietary or confidential information of other persons or organizations. I am contributing this program material on a nonconfidential nonobligatory basis to the Insite User's Library for inclusion in its program library, and I agree that the Library may use, duplicate, modify, publish, and sell the program material without obligation or liability of any kind. The Insite User's Library may publish my name and address, as the contributor, to facilitate user inquiries pertaining to this program material.

Signature _____ Date _____

INSITE™ USER'S PROGRAM LIBRARY
PROGRAM CERTIFICATION AND REVIEW FORM

Please check all statements made by the submitting author before noting program discrepancies. Any comments relating to program improvement are welcome; however, program revisions or rewrites must be sent in as original submissions.

PROGRAM NAME:	**CATALOG ORDER NUMBER:**

Were the author's comments accurate?	Yes ☐	No ☐
Were the usage instructions adequate?	Yes ☐	No ☐
Was the documentation sufficient?	Yes ☐	No ☐
Did you find the program useful for your particular project?	Yes ☐	No ☐

COMMENTS: (List general comments and any deficiencies noted or modifications made. Specifically identify problem areas and modifications.)

(Use additional sheets if necessary)

REVIEWED BY:	**COMPANY:**
NAME:	**ADDRESS:**
TELEPHONE:	

DOMESTIC SALES OFFICES

ALABAMA

Intel Corp
303 Williams Avenue, S.W
Suite 1422
Huntsville 35801
Tel: (205) 533-9353

ARIZONA

Intel Corp.
11225 N. 28th Drive
Suite 214D
Phoenix 85029
Tel. (602) 869-4980

CALIFORNIA

Intel Corp.
1010 Hurley Way
Suite 300
Sacramento 95825
Tel. (916) 929-4078

Intel Corp.
7670 Opportunity Road
Suite 135
San Diego 92111
(714) 268-3563

Intel Corp.*
2000 East 4th Street
Suite 100
Santa Ana 92705
Tel: (714) 835-9642
TWX: 910-595-1114

Intel Corp.*
1350 Shorebird Way
Mt. View 94043
Tel. (415) 968-8086
TWX: 910-339-9279
910-338-0255

Intel Corp.*
5530 Corbin Avenue
Suite 120
Tarzana 91356
Tel: (213) 708-0333
TWX. 910-495-2045

COLORADO

Intel Corp
4445 Northpark Drive
Suite 100
Colorado Springs 80907
Tel: (303) 594-6622

Intel Corp *
650 S. Cherry Street
Suite 720
Denver 80222
Tel: (303) 321-8086
TWX: 910-931-2289

CONNECTICUT

Intel Corp.
36 Padanaram Road
Danbury 06810
Tel: (203) 792-8366
TWX. 710-456-1199

EMC Corp
393 Center Street
Wallingford 06492
Tel: (203) 265-6991

FLORIDA

Intel Corp
1500 N.W. 62nd Street
Suite 104
Ft. Lauderdale 33309
Tel: (305) 771-0600
TWX: 510-956-9407

Intel Corp.
500 N. Maitland
Suite 205
Maitland 32751
Tel: (305) 628-2393
TWX: 810-853-9219

GEORGIA

Intel Corp.
3300 Holcombe Bridge Road
Suite 225
Norcross 30092
Tel: (404) 449-0541

ILLINOIS

Intel Corp *
2550 Golf Road
Suite 815
Rolling Meadows 60008
Tel. (312) 981-7200
TWX. 910-651-5881

INDIANA

Intel Corp.
9100 Purdue Road
Suite 400
Indianapolis 46268
Tel (317) 875-0623

IOWA

Intel Corp
St. Andrews Building
1930 St Andrews Drive N E
Cedar Rapids 52402
Tel (319) 393-5510

KANSAS

Intel Corp
8400 W 110th Street
Suite 170
Overland Park 66210
Tel (913) 642-8080

LOUISIANA

Industrial Digital Systems Corp
2332 Severn Avenue
Suite 202
Metairie 70001
Tel: (504) 831-8492

MARYLAND

Intel Corp.*
7257 Parkway Drive
Hanover 21076
Tel. (301) 796-7500
TWX 710-862-1944

Intel Corp
1620 Elton Road
Silver Spring 20903
Tel: (301) 431-1200

MASSACHUSETTS

Intel Corp *
27 Industrial Avenue
Chelmsford 01824
Tel (617) 256-1800
TWX 710-343-6333

EMC Corp
385 Elliot Street
Newton 02164
Tel. (617) 244-4740
TWX. 922531

MICHIGAN

Intel Corp *
26500 Northwestern Hwy.
Suite 401
Southfield 48075
Tel: (313) 353-0920
TWX. 810-244-4915

MINNESOTA

Intel Corp
3500 W 80th Street
Suite 360
Bloomington 55431
Tel (612) 835-6722
TWX 910-576-2867

MISSOURI

Intel Corp
4203 Earth City Expressway
Suite 131
Earth City 63045
Tel (314) 291-1990

NEW JERSEY

Intel Corp.*
Raritan Plaza III
Raritan Center
Edison 08837
Tel. (201) 225-3000
TWX 710-480-6238

NEW MEXICO

Intel Corp
1120 Juan Tabo N E
Albuquerque 87112
Tel: (505) 292-8086

NEW YORK

Intel Corp *
300 Vanderbilt Motor Parkway
Hauppauge 11788
Tel: (516) 231-3300
TWX 510-227-6236

Intel Corp
80 Washington Street
Poughkeepsie 12601
Tel (914) 473-2303
TWX 510-248-0060

Intel Corp *
211 White Spruce Boulevard
Rochester 14623
Tel (716) 424-1050
TWX 510-253-7391

T-Squared
6443 Ridings Road
Syracuse 13206
Tel (315) 463-8592
TWX 710-541-0554

T-Squared
7353 Pittsford
Victor Road
Victor 14564
Tel (716) 924-9101
TWX 510-254-8542

NORTH CAROLINA

Intel Corp
2306 W. Meadowview Road
Suite 206
Greensboro 27407
Tel (919) 294-1541

OHIO

Intel Corp.*
6500 Poe Avenue
Dayton 45414
Tel: (513) 890-5350
TWX 810-450-2528

Intel Corp *
Chagrin-Brainard Bldg , No 300
28001 Chagrin Boulevard
Cleveland 44122
Tel: (216) 464-6915
TWX. 810-427-9298

OKLAHOMA

Intel Corp.
4157 S Harvard Avenue
Suite 123
Tulsa 74135
Tel (918) 749-8688

OREGON

Intel Corp
10700 S.W. Beaverton
Hillsdale Highway
Suite 22
Beaverton 97005
Tel (503) 641-8086
TWX 910-467-8741

PENNSYLVANIA

Intel Corp *
510 Pennsylvania Avenue
Fort Washington 19034
Tel. (215) 641-1000
TWX 510-661-2077

Intel Corp *
201 Penn Center Boulevard
Suite 301W
Pittsburgh 15235
Tel. (412) 823-4970

Q E D Electronics
300 N York Road
Hatboro 19040
Tel (215) 674-9600

TEXAS

Intel Corp *
12300 Ford Road
Suite 380
Dallas 75234
Tel: (214) 241-8087
TWX 910-860-5617

Intel Corp *
7322 S W. Freeway
Suite 1490
Houston 77074
Tel (713) 988-8086
TWX 910-881-2490

Industrial Digital Systems Corp
5925 Sovereign
Suite 101
Houston 77036
Tel (713)988-9421

Intel Corp
313 E Anderson Lane
Suite 314
Austin 78752
Tel (512) 454-3628

UTAH

Intel Corp
268 West 400 South
Salt Lake City 84101
Tel (801) 533-8086

VIRGINIA

Intel Corp
1603 Santa Rosa Road
Suite 109
Richmond 23288
Tel (804) 282-5668

WASHINGTON

Intel Corp.
110 110th Avenue N E
Suite 510
Bellevue 98004
Tel (206) 453-8086
TWX 910-443-3002

WISCONSIN

Intel Corp
450 N Sunnyslope Road
Suite 130
Brookfield 53005
Tel. (414) 784-9060

CANADA

ONTARIO

Intel Semiconductor of Canada, Ltd
39 Hwy 7, Bell Mews
Nepean K2H 8R2
Tel (613) 829-9714
TELEX 053-4115

Intel Semiconductor of Canada, Ltd
50 Galaxy Boulevard
Suite 12
Rexdale M9W 4Y5
Tel (416) 675-2105
TELEX 06983574

Intel Semiconductor of Canada, Ltd
201 Consumers Road
Suite 200
Willowdale M2J 4G8
Tel (416) 494-6831
TELEX 4946831

QUEBEC

Intel Semiconductor of Canada, Ltd
3860 Cote Vertu Road
Suite 210
St. Laurent H4R 1V4
Tel (514) 334-0560
TELEX 05-824172

*Field Application Location

DOMESTIC DISTRIBUTORS

ALABAMA

†Arrow Electronics, Inc.
3611 Memorial Parkway So
Huntsville 35405
Tel: (205) 882-2730

†Hamilton/Avnet Electronics
4812 Commercial Drive N W
Huntsville 35805
Tel. (205) 837-7210
TWX 810-726-2162

†Pioneer/Huntsville
1207 Putnam Drive N.W
Huntsville 35805
Tel: (205) 837-9300
TWX 810-726-2197

ARIZONA

†Hamilton/Avnet Electronics
505 S Madison Drive
Tempe 85281
Tel. (602) 231-5140
TWX 910-950-0077

†Wyle Distribution Group
8155 N 24th Street
Phoenix 85021
Tel (602) 249-2232
TWX 910-951-4282

CALIFORNIA

†Arrow Electronics, Inc
521 Weddell Drive
Sunnyvale 94086
Tel (408) 745-6600
TWX 910-339-9371

†Arrow Electronics, Inc
19748 Dearborn Street
Chatsworth 91311
Tel. (213) 701-7500
TWX. 910-493-2086

†Hamilton/Avnet Electronics
350 McCormick Avenue
Costa Mesa 92626
Tel: (714) 754-6051
TWX 910-595-1928

†Hamilton/Avnet Electronics
19515 So Vermont Avenue
Torrance 90502
Tel (213) 615-3909
TWX 910-349-6263

†Hamilton/Avnet Electronics
1175 Bordeaux Drive
Sunnyvale 94086
Tel (408) 743-3300
TWX 910-339-9332

†Hamilton/Avnet Electronics
4545 Viewridge Avenue
San Diego 92123
Tel: (714) 641-1850
TWX 910-595-2638

†Hamilton/Avnet Electronics
10912 W. Washington Boulevard
Culver City 20230
Tel (213) 558-2458
TWX 910-340-6364

†Hamilton Avnet/Electronics
21050 Erwin Street
Woodland Hills 91367
Tel: (213) 883-0000
TWX 910-494-2207

†Hamilton Electro Sales
3170 Pullman Street
Costa Mesa 92626
Tel: (714) 641-4109
TWX. 910-595-2638

†Hamilton/Avnet Electronics
4103 Northgate Boulevard
Sacramento 95834
Tel (916) 920-3150

Kierulff Electronics, Inc
3969 E. Bayshore Road
Palo Alto 94303
Tel: (415) 968-6292
TWX. 910-379-6430

Kierulff Electronics, Inc
14101 Franklin Avenue
Tustin 92680
Tel: (714) 731-5711
TWX 910-595-2599

Kierulff Electronics, Inc
2585 Commerce Way
Los Angeles 90040
Tel (213) 725-0325
TWX 910-580-3666

†Wyle Distribution Group
124 Maryland Street
El Segundo 90245
Tel (213) 322-8100
TWX 910-348-7140 or 7111

CALIFORNIA (Cont'd)

†Wyle Distribution Group
9525 Chesapeake Drive
San Diego 92123
Tel (714) 565-9171
TWX 910-335-1590

†Wyle Distribution Group
3000 Bowers Avenue
Santa Clara 95051
Tel (408) 727-2500
TWX 910-338-0296

†Wyle Distribution Group
17872 Cowan Avenue
Irvine 92714
Tel (714) 641-1600
TWX 910-595-1572

COLORADO

†Wyle Distribution Group
451 E. 124th Avenue
Thornton 80241
Tel (303) 457-9953
TWX 910-936-0770

†Hamilton/Avnet Electronics
8765 E. Orchard Road
Suite 708
Englewood 80111
Tel (303) 740-1017
TWX 910-935-0787

CONNECTICUT

†Arrow Electronics, Inc
12 Beaumont Road
Wallingford 06492
Tel (203) 265-7741
TWX 710-476-0162

†Hamilton/Avnet Electronics
Commerce Industrial Park
Commerce Drive
Danbury 06810
Tel (203) 797-2800
TWX 710-456-9974

†Harvey Electronics
112 Main Street
Norwalk 06851
Tel (203) 853-1515
TWX 710-468-3373

FLORIDA

†Arrow Electronics, Inc
1001 N W 62nd Street
Suite 108
Ft Lauderdale 33309
Tel (305) 776-7790
TWX. 510-955-9456

†Arrow Electronics, Inc
50 Woodlake Drive W
Bldg B
Palm Bay 32905
Tel (305) 725-1480
TWX 510-959-6337

†Hamilton/Avnet Electronics
6801 N W 15th Way
Ft Lauderdale 33309
Tel (305) 971-2900
TWX 510-956-3097

†Hamilton/Avnet Electronics
3197 Tech Drive North
St Petersburg 33702
Tel: (813) 576-3930
TWX 810-863-0374

†Pioneer/Alta Monte Springs
221 N Lake Blvd
Suite 412
Alta Monte Springs 32701
Tel (305) 859-3600
TWX 810-853-0284

†Pioneer/Ft Lauderdale
1500 62nd Street N W
Suite 506
Ft Lauderdale 33309
Tel (305) 771-7520
TWX 510-955-9653

GEORGIA

†Arrow Electronics, Inc
2979 Pacific Drive
Norcross 30071
Tel (404) 449-8252
TWX 810-766-0439

†Hamilton/Avnet Electronics
5825 D Peachtree Corners
Norcross 30092
Tel (404) 447-7500
TWX 810-766-0432

†Pioneer/Georgia
5835B Peachtree Corners E
Norcross 30092
Norcross 30092
Tel (404) 448-1711
TWX 810-766-4515

ILLINOIS

†Arrow Electronics, Inc
2000 E Algonquin Street
Schaumberg 60195
Tel (312) 397-3440
TWX 910-291-3544

†Hamilton/Avnet Electronics
1130 Thorndale Avenue
Bensenville 60106
Tel (312) 860-7780
TWX 910-227-0060

†Pioneer/Chicago
1551 Carmen Drive
Elk Grove Village 60007
Tel (312) 437-9680
TWX 910-222-1834

INDIANA

†Arrow Electronics, Inc
2718 Rand Road
Indianapolis 46241
(317) 243-9353
TWX 810-341-3119

†Hamilton/Avnet Electronics
485 Gradle Drive
Carmel 46032
Tel (317) 844-9333
TWX 810-260-3966

†Pioneer/Indiana
6408 Castleplace Drive
Indianapolis 46250
Tel (317) 849-7300
TWX 810-260-1794

KANSAS

†Hamilton/Avnet Electronics
9219 Quivera Road
Overland Park 66215
Tel (913) 888-8900
TWX 910-743-0005

MARYLAND

†Hamilton/Avnet Electronics
6822 Oak Hall Lane
Columbia 21045
Tel (301) 995-3500
TWX 710-862-1861

†Mesa Technology Corporation
16021 Industrial Drive
Gaithersburg 20877
Tel (301) 948-4350TWX 710-828-9702

†Pioneer
9100 Gaither Road
Gaithersburg 20877
Tel (301) 948-0710
TWX 710-828-0545

MASSACHUSETTS

†Arrow Electronics, Inc
1 Arrow Drive
Woburn 01801
Tel (617) 933-8130
TWX 710-393-6770

†Hamilton/Avnet Electronics
50 Tower Office Park
Woburn 01801
Tel (617) 935-9700
TWX 710-393-0382

†Harvey/Boston
44 Hartwell Avenue
Lexington 02173
Tel (617) 863-1200
TWX 710-326-6617

MICHIGAN

†Arrow Electronics, Inc
3810 Varsity Drive
Ann Arbor 48104
Tel (313) 971-8220
TWX 810-223-6020

†Pioneer/Michigan
13485 Stamford
Livonia 48150
Tel (313) 525-1800
TWX 810-242-3271

†Hamilton/Avnet Electronics
32487 Schoolcraft Road
Livonia 48150
Tel (313) 522-4700
TWX. 810-242-8775

†Hamilton/Avnet Electronics
2215 29th Street S E
Space A5
Grand Rapids 49508
Tel (616) 243-8805
TWX 810-273-6921

MINNESOTA

†Arrow Electronics, Inc
5230 W 73rd Street
Edina 55435
Tel (612) 830-1800
TWX 910-576-3125

†Hamilton/Avnet Electronics
10300 Bren Road East
Minnetonka 55343
Tel (612) 932-0600
TWX (910) 576-2720

†Pioneer/Twin Cities
10203 Bren Road East
Minnetonka 55343
Tel (612) 935-5444
TWX 910-576-2738

MISSOURI

†Arrow Electronics, Inc
2380 Schuetz
St Louis 63141
Tel (314) 567-6888
TWX 910-764-0882

†Hamilton/Avnet Electronics
13743 Shoreline Court
Earth City 63045
Tel (314) 344-1200
TWX 910-762-0684

NEW HAMPSHIRE

†Arrow Electronics, Inc
1 Perimeter Road
Manchester 03103
Tel (603) 668-6968
TWX 710-220-1684

NEW JERSEY

†Arrow Electronics, Inc
Pleasant Valley Avenue
Moorestown 08057
Tel (215) 928-1800
TWX 710-897-0829

†Arrow Electronics, Inc
2 Industrial Road
Fairfield 07006
Tel (201) 575-5300
TWX 710-998-2206

†Hamilton/Avnet Electronics
1 Keystone Avenue
Bldg 36
Cherry Hill 08003
Tel (609) 424-0110
TWX 710-940-0262

†Hamilton/Avnet Electronics
10 Industrial
Fairfield 07006
Tel (201) 575-3390
TWX 710-734-4388

†Harvey Electronics
45 Route 46
Pinebrook 07058
Tel (201) 575-3510
TWX 710-734-4382

†MTI Systems Sales
383 Route 46 W
Fairfield 07006
Tel (201) 227-5552

NEW MEXICO

†Alliance Electronics Inc
11030 Cochiti S E
Albuquerque 87123
Tel (505) 292-3360
TWX 910-989-1151

†Hamilton/Avnet Electronics
2524 Baylor Drive S E
Albuquerque 87106
Tel (505) 765-1500
TWX 910-989-0614

NEW YORK

†Arrow Electronics, Inc
900 Broad Hollow Road
Farmingdale 11735
Tel (516) 694-6800
TWX 510-224-6126

†Arrow Electronics, Inc
3000 South Winton Road
Rochester 14623
Tel (716) 275-0300
TWX 510-253-4766

†Arrow Electronics, Inc
7705 Maltage Drive
Liverpool 13088
Tel (315) 652-1000
TWX 710-545-0230

†Arrow Electronics, Inc
20 Oser Avenue
Hauppauge 11788
Tel (516) 231-1000
TWX 510-227-6623

†Microcomputer System Technical Demonstrator Centers

DOMESTIC DISTRIBUTORS

NEW YORK (Cont'd)

†Hamilton/Avnet Electronics
333 Metro Park
Rochester 14623
Tel: (716) 475-9130
TWX: 510-253-5470

†Hamilton/Avnet Electronics
16 Corporate Circle
E. Syracuse 13057
Tel: (315) 437-2641
TWX: 710-541-1560

†Hamilton/Avnet Electronics
5 Hub Drive
Melville, Long Island 11747
Tel: (516) 454-6000
TWX: 510-224-6166

†Harvey Electronics
P.O. Box 1208
Binghamton 13902
Tel: (607) 748-8211
TWX: 510-252-0893

†Harvey Electronics
60 Crossway Park West
Woodbury, Long Island 11797
Tel: (516) 921-8700
TWX: 510-221-2184

†Harvey/Rochester
840 Fairport Park
Fairport 14450
Tel: (716) 381-7070
TWX: 510-253-7001

†MTI Systems Sales
38 Harbor Park Drive
Port Washington 11050
Tel: (516) 621-6200
TWX: 510-223-0846

NORTH CAROLINA

†Arrow Electronics, Inc.
938 Burke Street
Winston-Salem 27101
Tel: (919) 725-8711
TWX: 510-931-3169

†Hamilton/Avnet Electronics
3510 Spring Forest Drive
Raleigh 27604
Tel: (919) 878-0819
TWX: 510-928-1836

†Pioneer/Carolina
103 Industrial Avenue
Greensboro 27406
Tel: (919) 273-4441
TWX: 510-925-1114

OHIO

†Arrow Electronics, Inc.
7620 McEwen Road
Centerville 45459
Tel: (513) 435-5563
TWX: 810-459-1611

†Arrow Electronics, Inc.
6238 Cochran Road
Solon 44139
Tel: (216) 248-3990
TWX: 810-427-9409

†Hamilton/Avnet Electronics
954 Senate Drive
Dayton 45459
Tel: (513) 433-0610
TWX: 810-450-2531

†Hamilton/Avnet Electronics
4588 Emery Industrial Parkway
Warrensville Heights 44128
Tel: (216) 831-3500
TWX: 810-427-9452

OHIO (Cont'd)

†Pioneer/Dayton
4433 Interpoint Boulevard
Dayton 45424
Tel: (513) 236-9900
TWX: 810-459-1622

†Pioneer/Cleveland
4800 E. 131st Street
Cleveland 44105
Tel (216) 587-3600
TWX: 810-422-2211

OKLAHOMA

†Arrow Electronics, Inc.
4719 S. Memorial Drive
Tulsa 74145
Tel: (918) 665-7700

OREGON

†Almac Electronics Corporation
8022 S.W. Nimbus, Bldg. 7
Beaverton 97005
Tel: (503) 641-9070
TWX: 910-467-8743

†Hamilton/Avnet Electronics
6024 S.W. Jean Road
Bldg. C, Suite 10
Lake Oswego 97034
Tel: (503) 635-7848
TWX: 910-455-8179

PENNSYLVANIA

†Arrow Electronics, Inc.
650 Seco Road
Monroeville 15146
Tel: (412) 856-7000

†Pioneer/Pittsburgh
259 Kappa Drive
Pittsburgh 15238
Tel: (412) 782-2300
TWX: 710-795-3122

†Pioneer/Delaware Valley
261 Gibralter Road
Horsham 19044
Tel: (215) 674-4000
TWX: 510-665-6778

TEXAS

†Arrow Electronics, Inc.
13715 Gama Road
Dallas 75234
Tel: (214) 386-7500
TWX: 910-860-5377

†Arrow Electronics, Inc.
10899 Kinghurst
Suite 100
Houston 77099
Tel: (713) 530-4700
TWX: 910-880-4439

†Arrow Electronics, Inc. 10125
Metropolitan
Austin 78758
Tel: (512) 835-4100
TWX: 910-874-1348

†Hamilton/Avnet Electronics
2401 Rutland
Austin 78757
Tel: (512) 837-8911
TWX: 910-874-1319

†Hamilton/Avnet Electronics
2111 W. Walnut Hill Lane
Irving 75062
Tel: (214) 659-4100
TWX: 910-860-5929

TEXAS (Cont'd)

†Hamilton/Avnet Electronics
8750 West Park
Hosuton 77063
Tel: (713) 780-1771
TWX: 910-881-5523

†Pioneer/Austin
9901 Burnet Road
Austin 78758
Tel: (512) 835-4000
TWX: 910-874-1323

†Pioneer/Dallas
13710 Omega Road
Dallas 75234
Tel: (214) 386-7300
TWX: 910-850-5563

†Pioneer/Houston
5853 Point West Drive
Houston 77036
Tel. (713) 988-5555
TWX: 910-881-1606

UTAH

†Hamilton/Avnet Electronics
1585 West 2100 South
Salt Lake City 84119
Tel: (801) 972-2800
TWX: 910-925-4018

Wyle Distribution Group
1959 South 4130 West, Unit B
Salt Lake City 84104
Tel: (801) 974-9953

WASHINGTON

†Almac Electronics Corporation
14360 S.E. Eastgate Way
Bellevue 98007
Tel: (206) 643-9992
TWX: 910-444-2067

†Arrow Electronics, Inc.
14320 N.E. 21st Street
Bellevue 98007
Tel: (206) 643-4800
TWX. 910-444-2017

†Hamilton/Avnet Electronics
14212 N.E. 21st Street
Bellevue 98005
Tel: (206) 453-5874
TWX: 910-443-2469

WISCONSIN

†Arrow Electronics, Inc.
430 W. Rausson Avenue
Oakcreek 53154
Tel: (414) 764-6600
TWX: 910-262-1193

†Hamilton/Avnet Electronics
2975 Moorland Road
New Berlin 53151
Tel: (414) 784-4510
TWX: 910-262-1182

CANADA

ALBERTA

†Hamilton/Avnet Electronics
2816 21st Street N.E.
Calgary T2E 6Z3
Tel (403) 230-3586
TWX. 03-827-642

†L.A. Varah, Ltd.
4742 14th Street N.E.
Calgary T2D 6L7
Tel: (403)230-1235
TWX: 038-258-97

ALBERTA (Cont'd)

Zentronics
Bay #1
3300 14th Avenue N.E.
Calgary T2A 6J4
Tel: (403) 272-1021

BRITISH COLUMBIA

L.A. Varah, Ltd.
2077 Alberta Street
Vancouver V6Y 1C4
Tel: (604) 873-3211
TWX: 610-929-1068

Zentronics
108-11400 Bridgeport Road
Richmond V6X 1T2
Tel: (604) 273-5575
TWX: 04-5077-89

MANITOBA

L.A. Varah, Ltd
12-1832 King Edward Street
Winnipeg R2R ON1
Tel: (204) 633-8190
TWX: 07-55-365

Zentronics
590 Berry Street
Winnipeg R3H OS1
Tel: (204) 775-8661

ONTARIO

Hamilton/Avnet Electronics
6845 Rexwood Road
Units G & H
Mississauga L4V 1R2
Tel: (416) 677-7432
TWX: 610-492-8867

Hamilton/Avnet Electronics
210 Colonnade Road South
Nepean K2E 7L5
Tel: (613) 226-1700
TWX: 05-349-71

L.A. Varah, Ltd.
505 Kenora Avenue
Hamilton L8E 3P2
Tel: (416) 561-9311
TWX: 061-8349

Zentronics
8 Tilbury Court
Brampton L6T 3T4
Tel: (416) 451-9600
TWX: 06-976-78

Zentronics
564/10 Weber Street North
Waterloo N2L 5C6
Tel: (519) 884-5700

Zentronics
590 Berry Street
Winnipeg R3H OS1
Tel: (204) 775-8661

QUEBEC

Hamilton/Avnet Electronics
2670 Sabourin Street
St. Laurent H4S 1M2
Tel: (514) 331-6443
TWX: 610-421-3731

Zentronics
505 Locke Street
St. Laurent H4T 1X7
Tel: (514) 735-5361
TWX: 05-827-535

†Microcomputer System Technical Demonstrator Centers

EUROPEAN SALES OFFICES

BELGIUM

Intel Corporation S.A.
Parc Seny
Rue du Moulin a Papier 51
Boite 1
B-1160 Brussels
Tel: (02)661 07 11
TELEX: 28414

DENMARK

Intel Denmark A/S*
Lyngbyvej 32F 2nd Floor
DK-2100 Copenhagen East
Tel: (01) 18 20 00
TELEX: 19567

FINLAND

Intel Finland OY
Hameentie 103
SF - 00550 Helsinki 55
Tel: 0/716 955
TELEX: 123 332

FRANCE

Intel Corporation, S.A.R.L *
5 Place de la Balance
Silic 223
94528 Rungis Cedex
Tel: (01) 687 22 21
TELEX: 270475

FRANCE (Cont'd)

Intel Corporation, S A R.L
Immeuble BBC
4 Quai des Etroits
69005 Lyon
Tel: (7) 842 40 89
TELEX: 305153

WEST GERMANY

Intel Semiconductor GmbH*
Seidlstrasse 27
D-8000 Muenchen 2
Tel: (89) 53891
TELEX: 05-23177 INTL D

Intel Semiconductor GmbH*
Mainzer Strasse 75
D-6200 Wiesbaden 1
Tel. (6121) 70 08 74
TELEX: 04186183 INTW D

Intel Semiconductor GmbH
Brueckstrasse 61
7012 Fellbach
West Germany
Tel: (711) 58 00 82
TELEX. 7254826 INTS D

Intel Semiconductor GmbH*
Hohenzollern Strasse 5*
3000 Hannover 1
Tel: (511) 34 40 81
TELEX 923625 INTH D

Intel Semiconductor GmbH
Ober-Ratherstrasse 2
D-4000 Dusseldorf 30
Tel: (211) 65 10 54
TELEX: 08-58977 INTL D

ISRAEL

Intel Semiconductor Ltd.*
P.O. Box 1659
Haifa
Tel 4/524
TELEX: 46511

ITALY

Intel Corporation Italia Spa*
Milanofiori, Palazzo E
20094 Assago (Milano)
Tel: (02) 824 00 06
TELEX. 315183 INTMIL

NETHERLANDS

Intel Semiconductor Nederland B V *
Alexanderpoort Building
Marten Meesweg 93
3068 Rotterdam
Tel. (10) 21 23 77
TELEX 22283

NORWAY

Intel Norway A/S
P O. Box 92
Hvamveien 4
N-2013
Skjetten
Tel. (2) 742 420
TELEX 18018

SWEDEN

Intel Sweden A B *
Box 20092
Archimedesvagen 5
S-16120 Bromma
Tel: (08) 98 53 85
TELEX. 12261

SWITZERLAND

Intel Semiconductor A G *
Forchstrasse 95
CH 8032 Zurich
Tel: (01) 55 45 02
TELEX: 57989 ICH CH

UNITED KINGDOM

Intel Corporation (U.K.) Ltd*
5 Hospital Street
Nantwich, Cheshire CW5 5RE
Tel. (0270) 626 560
TELEX 36620

Intel Corporation (U.K.) Ltd *
Pipers Way
Swindon, Wiltshire SN3 1RJ
Tel. (0793) 488 388
TELEX 444447 INT SWN

*Field Application Location

EUROPEAN DISTRIBUTORS/REPRESENTATIVES

AUSTRIA

Bacher Elektronische Geraete GmbH
Rotenuehlgasse 26
A 1120 Vienna
Tel: (222) 83 63 96
TELEX: 11532 BASAT A

BELGIUM

Inelco Belgium S.A.
Ave. des Croix de Guerre 94
B1120 Brussels
Tel: (02) 216 01 60
TELEX: 25441

DENMARK

MultiKomponent A/S
Fabriksparken 31
DK-2600 Gloskrup
Tel: (02) 45 66 45
TX: 33355

Scandinavian Semiconductor
Supply A/S
Nannasgade 18
DK-2200 Copenhagen
Tel. (01) 83 50 90
TELEX. 19037

FINLAND

Oy Fintronic AB
Melkonkatu 24 A
SF-00210
Helsinki 21
Tel: (0) 692 60 22
TELEX: 124 224 Ftron SF

FRANCE

Generim
Z.I. de Courtaboeuf
Avenue de la Baltique
91943 Les Ulis Cedex-B.P.88
Tel: (6) 907 78 79
TELEX: F691700

Jermyn S.A.
rue Jules Ferry 35
93170 Bagnolet
Tel: (1) 859 04 04
TELEX: 21810 F

Metrologie
La Tour d' Asnieres
1, Avenue Laurent Cely
92606-Asnieres
Tel: (1) 791 44 44
TELEX: 611-448

FRANCE (Cont'd)

Tekelec Airtronic
Cite des Bruyeres
Rue Carle Vernet
F-92310 Sevres
Tel: (01) 534 75 35
TELEX 204552

WEST GERMANY

Electronic 2000 Vertriebs A G
Neumarkter Strasse 75
D-8000 Munich 80
Tel: (89) 43 40 61
TELEX 522561 EIEC D

Jermyn GmbH
Postfach 1180
Schulstrasse 48
D-6277 Bad Camberg
Tel: (06434) 231
TELEX: 484426 JERM D

Celdis Enatechnik Systems GmbH
Gutenbergstrasse 4
2359 Henstedt-Ulzburg 1
Tel: (04193) 4026
TELEX: 2180260

Proelectron Vertriebs GmbH
Max Planck Strasse 1-3
6072 Dreieich bei Frankfurt
Tel (6103) 33564
TELEX: 417983

IRELAND

Micro Marketing
Glenageary Office Park
Glenageary
Co. Dublin
Tel. (1) 85 62 88
TELEX: 31584

ISRAEL

Eastronics Ltd
11 Rozanis Street
P O Box 39300
Tel Aviv 61390
Tel. (3) 47 51 51
TELEX: 33638

ITALY

Eledra 3S S.P A
Viale Elvezia, 18
I 20154 Milano
Tel: (2) 34 97 51
TELEX: 332332

ITALY (Cont'd)

Intesi
Milanfiori Pal E/5
20090 Assago
Milano
Tel (02) 82470
TELEX. 311351

NETHERLANDS

Koning & Hartman
Koperwerf 30
P.O Box 43220
2544 EN's Gravenhage
Tel: 31 (70) 210 101
TELEX: 31528

NORWAY

Nordisk Elektronic (Norge) A/S
Postoffice Box 122
Smedsvngen 4
1364 Hvalstad
Tel (2) 786 210
TELEX. 77546

PORTUGAL

Ditram
Componentes E Electronica LDA
Av Miguel Bombarda, 133
P1000 Lisboa
Tel (19) 545 313
TELEX: 14182 Bneks-P

SPAIN

Interface S.A.
Ronda San Pedro 22,3
Barcelona 10
Tel (3) 301 78 51
TWX 51508

ITT SESA
Miguel Angel 23-3
Madrid 10
Tel: (1) 419 54 00
TELEX 27707

SWEDEN

AB Gosta Backstrom
Box 12009
Alstroemergatan 22
S-10221 Stockholm 12
Tel: (8) 541 080
TELEX: 10135

SWEDEN (Cont'd)

Nordisk Electronik AB
Box 27301
Sandhamnsgatan 71
S-10254 Stockholm
Tel: (8) 635 040
TELEX 10547

SWITZERLAND

Industrade AG
Gemsenstrasse 2
Postcheck 80 - 21190
CH-8021 Zurich
Tel. (01) 363 23 20
TELEX 56788 INDEL CH

UNITED KINGDOM

Bytech Ltd
Unit 57
London Road
Earley, Reading
Berkshire
Tel (0734) 61031
TELEX 848215

Comway Microsystems Ltd
Market Street
UK-Bracknell, Berkshire
Tel. 44 (344) 55333
TELEX: 847201

Jermyn Industries
Vestry Estate
Sevenoaks, Kent
Tel: (0732) 450144
TELEX 95142

M E.D.L.
East Lane Road
North Wembley
Middlesex HA9 7PP
Tel: (01) 904 93 07
TELEX: 28817

Rapid Recall, Ltd
Rapid House/Denmark St
High Wycombe
Berks, England · HP11 2ER
Tel. (0494) 26 271
TELEX: 837931

YUGOSLAVIA

H R Microelectronics Enterprises
P O Box 5604
San Jose, California 95150
Tel: 408/978-8000
TELEX. 278-559

Intel Corporation
3065 Bowers Avenue
Santa Clara, CA 95051

Intel Corporation S.A.
Parc Seny
Rue du Moulin à Papier 51
Boite 1
B-1160 Brussels
Belgium

Intel Japan K.K.
5-6 Tokodai Toyosato-machi
Tsukuba-gun, Ibaraki-ken 300-26
Japan

Printed in U.S.A./C-414/25K/0883/TN/RRD
Software