iSBC 957
INTELLEC - iSBC 86/12A INTERFACE AND EXECUTION PACKAGE

Establishes communication between the iSBC 86/12A and the Intellec Development Systems to aid in MCS-86™ software development

Allows full speed execution of MCS-86™ programs

Includes EPROM resident system monitor for iSBC 86/12A

Allows Intellec ISIS-II files to be transferred between iSBC 86/12A and Intellec Microcomputer Development System

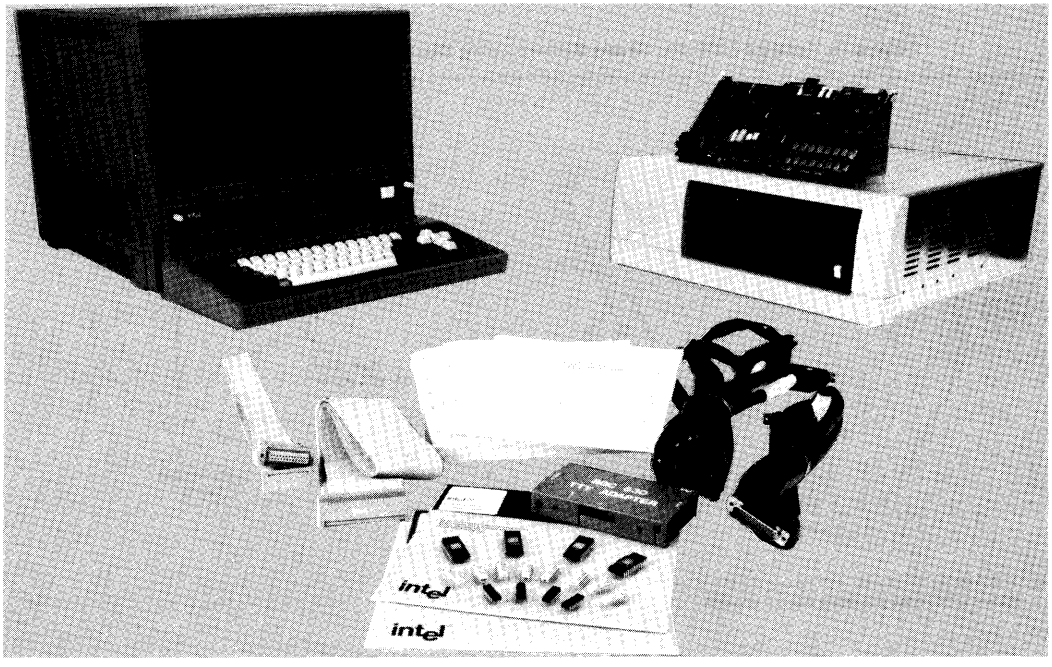
Offers "Virtual Terminal" capability which permits the Intellec console to access the iSBC 86/12A Monitor

Provides powerful console commands for software debug

Allows access to all iSBC 86/12A memory, registers, flags and I/O ports

Includes all necessary hardware, software and documentation

The iSBC 957 Intellec-iSBC 86/12A Interface and Execution Package contains all the necessary hardware, software cables and documentation required to interface an iSBC 86/12A Single Board Computer to an Intellec Microcomputer Development System for software development and full speed execution.



FUNCTIONAL DESCRIPTION

Overview

The iSBC 957 Intellec-iSBC 86/12A Interface and Execution Package extends the software development capabilities of the Intellec Microcomputer Development Systems to the iSBC 86/12 and iSBC 86/12A Single Board Computers. It allows software modules developed under the Intellec resident ISIS-II Operating Systems to be down loaded to the iSBC 86/12A for full-speed execution and debug. In addition, the iSBC 957 allows segments of iSBC 86/12A memory to be saved on floppy disk files. Special communication software allows transparent access to the powerful debug commands in the iSBC 86/12A monitor from the Intellec console terminal.

Software Capabilities

The software included in the iSBC 957 package consists of the iSBC 86/12A monitor residing on four Intel EPROMs which are inserted into sockets on the iSBC 86/12A board. A diskette is also included which contains the Intellec resident communications software that links the iSBC 86/12A with the Intellec Microcomputer Development System. The EPROM resident software creates an execution environment in which object modules may be loaded into the iSBC 86/12A memory, executed at full speed, modified if necessary and saved on the Intellec system floppy disk. The monitor provides the ability to execute selected program segments with breakpoints or by single stepping, examine and modify registers and memory, perform port I/O, move a block of memory, compare blocks of memory, search for a word/

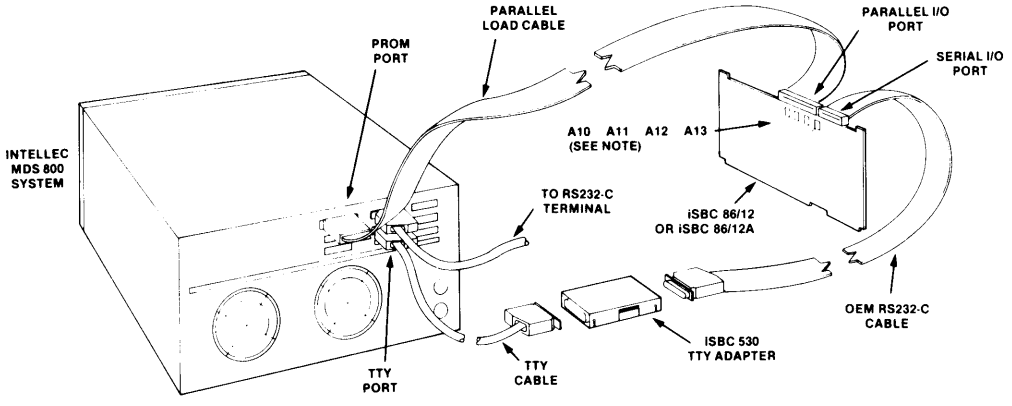
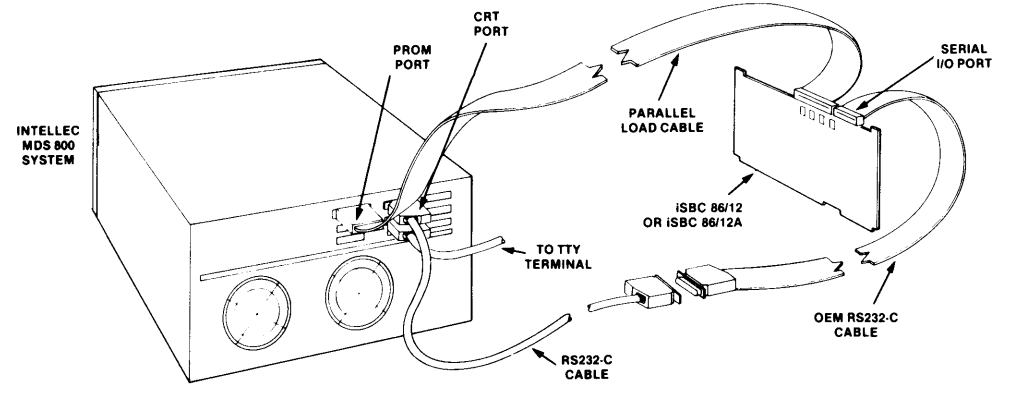


Figure 1a. Intellec MDS-800 Series System Using RS232-C Compatible Terminal



Note: A10, A12, A13 — Insert Terminator Pack (supplied)
A11 — Insert Status Adapter Ass'y (supplied)

Figure 1b. Intellec MDS-800 Series System with TTY Terminal

byte value, and perform hex arithmetic. In addition, the monitor provides for the recognition of interrupts via a user-defined table. The program on the diskette contains communication software which passes appropriate console commands to the iSBC 86/12A resident monitor and also interfaces with the ISIS-II operating system to transfer files between the development system diskettes and the iSBC 86/12A.

System Interfacing

The physical interface between the Intellec Microcomputer Development System and the iSBC 86/12A is accomplished with cables supplied with the iSBC 957 package. The cabling arrangement varies depending on whether the system is a member of the Intellec MDS-800 family or one of the Intellec Series II family.

Intellec MDS-800 Interface — In the case of the Intellec MDS-800 family, cables connect the serial I/O port of the iSBC 86/12A to the available serial port on the Intellec system (if the TTY port is used for the iSBC 86/12A interface, the iSBC 530 TTY adapter is inserted into the line). (See Figure 1.) This serial port implements the communication link from the Intellec console terminal to the iSBC 86/12A resident monitor via the Intellec based communication software and is used to pass commands to the iSBC 86/12A. Additionally, a cable is run from the Universal PROM Programmer (UPP) port on the Intellec system to the parallel I/O port on the iSBC 86/12A. The necessary terminators/line drivers and a status adapter assembly are also included to complete this parallel interface on the iSBC 86/12A. This interconnection is used for transferring the ISIS-II disk files between the development system and the iSBC 86/12A.

Intellec Series II Interface — For Intellec Series II Development Systems the connection between it and the iSBC 86/12A is accomplished with a single serial line in-

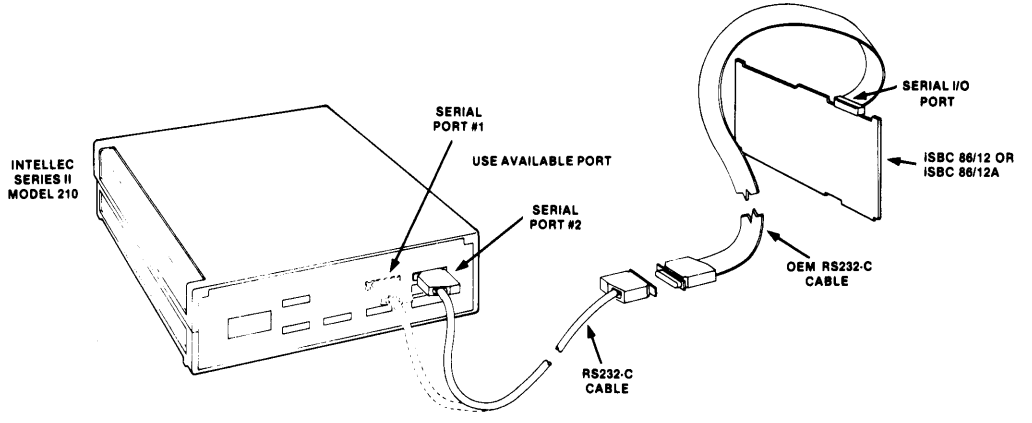


Figure 2a. Intellec Series II Model 210

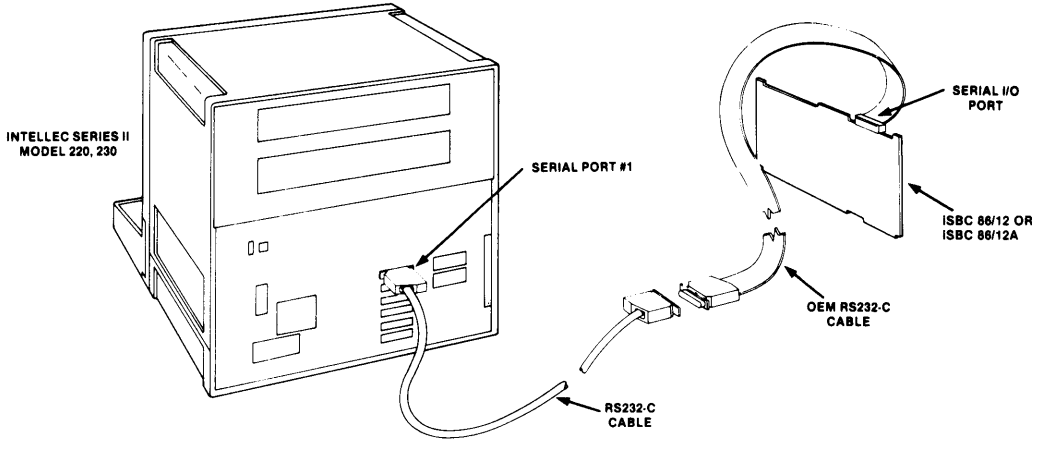


Figure 2b. Intellec Series Models 220, 230

terconnecting the iSBC 86/12A serial port with an available serial port on the Intellec system. All communication including command and data transfer occurs over this serial line. Development systems based on the Intellec Model 210 can use either one of the two available serial ports. (See Figure 2a.) On Models 220 and 230, Serial Port 1 is specified. (See Figure 2b.)

Intellec Environment

An Intellec Microcomputer Development System to be used in conjunction with the iSBC 957 package and an iSBC 86/12A must have the following necessary functionality to support program development and storage:

1. Intellec Development System with 64K bytes of RAM.
2. Console CRT or TTY terminal.
3. Intellec MDS-DDS Dual Double Density Diskette Drive and ISIS-II Operating System or Intellec MDS-2DS Dual Single Density Diskette Drive and ISIS-II Operating System.
4. User-selected language translators.

Note: The Intellec Series II Model 230 Microcomputer Development System and the Intellec MDS-888 Microcomputer Development Center contain all necessary hardware and operating system software to be used with the iSBC 957 package and the iSBC 86/12A.

Execution Environment

A full capability iSBC 86/12A execution environment should include the following components for effective utilization:

1. An iSBC 86/12A Single Board Computer.
2. An iSBC 957 Intellec-iSBC 86/12A Interface and Execution Package.
3. An iSBC 655 or iSBC 660 System Chassis for power and MULTIBUS expansion.
4. One or more iSBC 032, 048, or 064 RAM boards for programs requiring more than 32K bytes of RAM.

Note: The iSBC 86/12A cannot be mounted in the Intellec system and requires a separate operating environment.

Additional memory boards, analog and digital I/O boards, and peripheral controllers can be included in the iSBC 660 System Chassis with the iSBC 86/12A to allow the execution environment to be equivalent to the expected final product configuration.

SPECIFICATIONS

Hardware

Cables

(1) OEM RS232-C cable — Mates with serial I/O port on iSBC 86/12A

(1) RS232-C port cable — Mates with RS232-C port on Intellec system

(1) TTY port cable — Mates with TTY port on Intellec system

(1) Parallel load cable — Mates with UPP port on Intellec system and parallel I/O port on iSBC 86/12A (only used on Intellec MDS-800 series systems)

All cables allow separation of Intellec system and iSBC 86/12A of up to 6 feet.

I/O Drivers and Terminators

(1) 7437 48 mA open collector drivers

(4) iSBC 901 220Ω/330Ω terminator packs

(4) iSBC 902 1 kΩ terminator packs

Drivers and terminators needed when parallel load cable is required

Interface Adapters

(1) iSBC 530 TTY adapter — Used when serial I/O line connects with TTY port on Intellec system

(1) Parallel port status adapter — Mounts on iSBC 86/12A when parallel load cable is required

Miscellaneous — Attachment screws for Intellec mounted connectors

Software

(4) EPROMs with iSBC 86/12A system monitor

(1) Single density floppy diskette with iSBC 86/12A ISIS-II communication software

(1) Double density floppy diskette with iSBC 86/12A ISIS-II communication software

System Monitor

Addresses: RAM: 00000-00180$_H$; ROM: FE000-FFFF$_H$

Commands

	Basic Commands	
N	(Next)	Single stepped program execution
G	(Go)	Program start with optional breakpoints
S	(Substitute)	Examine and modify memory
X	(Examine)	Examine and modify registers
D	(Display)	Display blocks of memory
M	(Move)	Moves (duplicates) blocks of memory
C	(Compare)	Compare two blocks of memory
F	(Find)	Searches for byte/word value
H	(Hex Arithmetic)	Performs hexadecimal add and subtract
I	(Port Input)	Reads an I/O port
O	(Port Output)	Writes to an I/O port
R	(Read Tape)	Reads and loads paper tape object file
W	(Write Tape)	Writes memory block to paper tape
	Intellec Mode Commands	
L	(Load File)	Loads ISIS-II file to iSBC 86/12A
T	(Transfer File)	Writes memory block to ISIS-II file
E	(Exit)	Return to ISIS (Basic Command Mode)

Transfer Rates

Intellec MDS-800 Family

Serial transfer: 110 baud

Parallel transfer: 1K bytes/sec

Intellec Series II Family

Serial transfer: Determined by system console (up to 9600 baud)

Reference Manuals

9800645 — iSBC 86/12 Hardware Reference Manual

9803074-01 — iSBC 86/12A Hardware Reference Manual

9800743 — iSBC 957 Intellec-iSBC 86/12 Interface and Execution Package User's Guide

9800640 — 8086 Assembly Language Manual

ORDERING INFORMATION

Part Number	Description
SBC 957	Intellec-iSBC 86/12A Interfacing and Execution Package