

IBM INSTRUMENTS, INC.  
SYSTEM/9000 OPERATING SYSTEM  
RELEASE 1.1 NOTES

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P/N 6294130

## GETTING STARTED WITH RELEASE 1.1

1. Complete the system setup.
2. Read "Restrictions in Release 1.1" and "Warnings"
3. The 1.1 Extensions Diskette is formatted in 1.0. You must use the COPY program to convert to the 1.1 format. Basic, Pascal, and Fortran are formatted in 1.1. Keep the shipped diskette as a master and not for day-to-day use. If you have a hard disk, we recommend that you copy the Extensions diskette to your hard disk drive number 4. To perform the copy:

FORMAT a new diskette (or the hard disk). For example: (0:FORMAT) and answer the following prompts.

COPY all files from the Extensions diskette to the new diskette (or hard disk). For example: (0:COPY 0:\*.\*,X:\*.\*;Y) where X is the destination drive number. The 'Y' option eliminates the prompting for each file.

4. Put the Release 1.1 Extensions Diskette away.
5. If you have a hard disk, type "SET DD=4" (default drive reset). If you have no hard disk, place the newly formatted diskette in drive 0.

## DIAGNOSTICS

1. In addition to ROM diagnostics there is a set of RAM diagnostics on the Release 1.1 Extensions Diskette. The RAM diagnostics contain everything in the ROM version plus hard disk diagnostics. Test #13 is a hard disk controller test, and tests 40 through 43 are hard disk drive tests.

To run the RAM diagnostics, insert the Operating System diskette into drive 0 and type "RAMDIAGS".

The system will then prompt you to press the STOP ("ESC") and EXECUTE ("F10") keys as it does when you begin manual diagnostics.

To return to the operating system, run test #FE subtest #0.

2. Error messages are displayed when the system fails diagnostics. The error message will refer you to a section of the Problem Isolation Manual. During power-on diagnostics the reference to the Problem Isolation Manual will be the only error message displayed. During manual diagnostics both the previous error messages (displayed in the upper right hand corner) and the new message will be displayed.
3. The diskette tests (#20 through #23) test the door open and door closure status bits. Therefore, you are instructed to open and close the door of the disk drive before beginning the test. Failure to toggle the door will result in failure.
4. Test #98 will display the amount of memory in the system which was tested. If there is more memory in the system than the amount displayed in test #98, the address switches on the memory boards should be checked.
5. When the "ESC" key is pressed during power-on diagnostics the system will jump to manual diagnostics. To exit the manual diagnostics run test #FE subtest #0.

## RESTRICTIONS IN RELEASE 1.1

### 1. FORMAT COMMAND

The FORMAT command formats disks with a bit-mapped sector allocation scheme for 1.1. FORMAT supports only 10MB hard disks, 8-inch and 5-1/4-inch double-sided, double-density diskettes.

The Hard Disk comes with a list of bad sectors in the following format:

```
Hard Error Map
CYL HD SEC BYTE
xxx x xx xxx (the BYTE field can be ignored)
```

These values correspond to a physical address on the disk. They must be entered on the Hard Disk by converting the values into logical sector numbers (LSN's), and entering them when prompted for in the FORMAT program. To do this, find the 'INT9' value in the table below that corresponds to the 'SEC' value given, and use it in the following algorithm:

$$\text{LSN} = (\text{CYL} * 32 * 4) + (\text{HD} * 32) + \text{INT9}$$

#### Interleave Table

SEC	INT9	SEC	INT9	SEC	INT9	SEC	INT9
***	*****	***	*****	***	*****	***	*****
1	- 0	9	- 8	17	- 16	25	- 24
2	- 25	10	- 1	18	- 9	26	- 17
3	- 18	11	- 26	19	- 2	27	- 10
4	- 11	12	- 19	20	- 27	28	- 3
5	- 4	13	- 12	21	- 20	29	- 28
6	- 29	14	- 5	22	- 13	30	- 21
7	- 22	15	- 30	23	- 6	31	- 14
8	- 15	16	- 23	24	- 31	32	- 7

```
Example: CYL HD SEC BYTE
          148 1 17 254
```

$$\text{LSN} = (148 * 32 * 4) + (1 * 32) + 16 = 18992$$

The Hard Error Map values are based on a sector interleave of 1 to 1. The S/9000 default interleave for the Hard Disk is 9 to 1, therefore the table look-up calculations must be made.

Since these values must be re-entered every time the disk is formatted, it is recommended that you write the LSN next to the physical address values, and then affix this information somewhere on the disk drive cover.

2. SUPPORT FOR 5 1/4-INCH DISKETTES

The Release 1.1 FORMAT only supports 96 tracks per inch (80 tracks per side). The 5 1/4-inch diskettes used must be double-sided, double-density, soft-sectored, and certified for operation at 77/80 tracks per side (100/96 TPI drive). The following manufacturers supply 5 1/4-inch diskettes of this type:

Brown Disk	3M	Maxwell	Memorex
Dysan	Nashua	Verbatim	Xidex

DO NOT attempt to use diskettes that are certified at less than 96 tracks per inch because you may encounter disk errors and permanent loss of data.

3. SETTING THE BAUD RATE OF RS232 PORTS

Programs written in high level languages which attempt to change the baud rate of the port after a transmission error has occurred may not work correctly. If you need to perform this type of programming we recommend that you use assembly language for the portion which does this.

4. IEEE-488 USING DMA WITH THE S/9000 AS A SLAVE

This does not work properly and should not be used.

## WARNINGS

### 1. HARD DISK POWER ON AND OFF

DO NOT power off the S/9000 while the hard disk is running. If you do this, you may cause unrecoverable loss of part or all of your data on the hard disk. To power on, first turn on the S/9000, and then immediately turn on the hard disk unit. To power off, first shut down the hard disk, and then the S/9000.

### 2. DUPLICATE DISK VOLUME IDENTIFIERS

Unique volume identifiers for each disk formatted is recommended. Hard disks should be given identifiers that would not be used for any diskettes. Diskettes should have volume identifiers printed on their labels to avoid using duplicates during the same session.

NOTE: If a diskette with a given volume identifier is removed from the system, and a different diskette with the same volume identifier is put in the same drive, no disk change will be detected. This can result in a corrupted diskette.

### 3. SYSTEM MEMORY POOL ALLOCATION

The S/9000 is shipped with enough memory allocated to the free memory pool to handle most general purpose needs. You may find, however, that when many files are opened simultaneously that you run out of memory. The message "MEMORY NOT AVAILABLE" may appear. You need to add additional memory to the pool, and you use the SET SM=+nn command to add 1024 byte increments to the pool. See Part 1 of CSOS Reference Manual for guidelines on this.

## "INCLUDE" FILES ON RELEASE 1.1 OS EXTENSIONS DISKETTE

These files are for use with the Assembler. You use the Assembler INCLUDE statement to merge them with your source statements. These files include EQUATE statements and/or MACRO definitions. The following files are found on the extensions diskette:

COMDEF50.INC Equates for use with GBASPTR System Call.

DKMCLB50.INC Equates for files and disk/diskette.  
NOTE: This include must follow IOMCLB50.INC  
because it references DIB files.

GRMCLB50.INC Equates for #GR Graphics driver.  
Uses GR prefix for all equates.

IOMCLB50.INC Equates for EVB, DIB, DTCB, and common FPKT's.  
Macros for SYSIO and SUSPEND.

KBMCLB50.INC Equates for #CON keyboard driver.

KPMCLB50.INC Equates for #KPD keypad driver.

PARDEF50.INC Equates for use with GSTAT System Call for parsing.

PPMCLB50.INC Equates for #PPU parallel port driver.

PRMCLB50.INC Equates for #PR Printer Driver.

RSMCLB50.INC Equates for #SERnn Serial Port Driver.

RTMMAC50.INC Macro and Equates for RTMGR Real Time Manager Facility.

SCMCLB50.INC Equates for #SCRN0, #SCRN1, #CNSLO display driver.

SEMMAC50.INC Macro and Equates for Semaphore Facility.

SIMCLB50.INC Equates for Sensor I/O driver.

SYSMAC50.INC Macros for S/9000 System Calls.

### IEEE-488 DRIVER EQUATES

We do not plan on shipping an equate file for IEEE-488 due to the large number of function names and the need to devise cryptic function mnemonics for them. We suggest that you make up your own file of equates for the functions that you need, or else use the function numbers directly.

## SAMPLE PROGRAM ON RELEASE 1.1 OS EXTENSIONS DISKETTE

The source code for "MENU" is included on the diskette as the file MENU.ASM. You may copy this file to a new formatted diskette, edit it as necessary, and then assemble it. The menu program illustrates the use of graphics and function keys.

## DEMO PROGRAMS ON RELEASE 1.1 OS EXTENSIONS DISKETTE

Three graphics demonstration programs DEMO1, DEMO2, and DEMO3 are on the release diskette.

## COMPUTER SYSTEM TECHNICAL REFERENCE MANUAL

The Technical Reference Manual is still in preparation. Two excerpts from this manual, Sensor I/O Board Interface Data, and System 9000 Device and Address Information are being provided to assist you in the interim.