# SYSTEM CONFIGURATION INFORMATION

Thank you for purchasing a GIMIX 6809 microcomputer system. This section of the manual consists of a collection of notes on the installation, setup, and use of GIMIX 6809 systems. First-time users should read through this information carefully before setting up the system. Users who are already familiar with GIMIX systems should look through the sheets marked "*", in the list below, indicating new or revised information. If, after reading this and the other appropriate sections of the manual, you have questions concerning the setup and use of this system, please call us.

We welcome suggestions for additions or corrections to this and other sections of the manual. If you have any suggestions, please submit them in writing to: GIMIX Inc., Attn. Mike Magnus, 1337 W. 37th. Place, Chicago IL, 60609.

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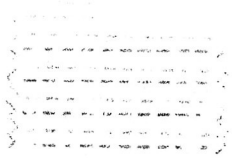
********** IMPORTANT - PLEASE READ **********

# UNPACKING YOUR GIMIX SYSTEM

To protect your GIMIX 6809 system during shipping, packing material has been placed INSIDE the system. YOU MUST REMOVE THE TOP COVER AND ALL OF THE PACKING MATERIAL BEFORE APPLYING POWER TO THE SYSTEM. Remove the packing carefully and be sure that all of the boards are fully seated on the motherboard connectors. Check carefully for small parts that may have been packed inside. In most systems the AC line cord and keys are packed inside the cabinet. Small parts, such as cables, may also be packed inside. You should also check the system carefully for any damage that may have occurred during shipping. If damage is apparent, contact GIMIX and the carrier immediately.

The system can be operated with the cover removed to facilitate initial setup and testing; however, we recommend that the cover be kept in place as much as possible during normal operation to insure proper cooling. (This is especially important with hard disk systems.)

We suggest that you retain the original box and packing material in case it is ever necessary to ship the system.



********** IMPORTANT - PLEASE READ **********

# CONFIGURATION INFORMATION FOR THE GIMIX TWO PORT SERIAL I/O BOARD

This notice outlines the recommended procedure for connecting serial peripherals (terminals , printers, etc.) to the GIMIX Two Port RS-232C serial interface board. Failure to follow the recommended procedure can result in random I/O errors caused by noise pickup on unused handshake lines (CTS and/or DCD). The errors are most noticeable on interrupt driven systems (OS-9 and UniFLEX) where noise can cause the generation of interrupts that cannot be identified by the operating system.

As shipped, the jumpers on the Two Port serial boards are normally configured as shown in figure "B" of the "JUMPER CONFIGURATIONS" drawing included with the board. The following chart shows the DB-25 connector pinouts for this configuration.

| Signal | Pin# | Direction Computer | Peripheral |
|---|---|---|---|
| RX | 2 | <---------- | |
| TX | 3 | >---------- | |
| | 4 | -----> | |
| | | [ | |
| | 5 | -----> | |
| GND | 7 | <---------- | |
| RTS | 8 | >---------- | |
| DCD | 12 | <---------- | |
| CTS | 20 | <---------- | |

High-speed terminals normally require a simple three wire cable, without handshake, connecting pins 2,3, and 7 of the I/O board to the corresponding pins on the terminal. THE UNUSED HANDSHAKE INPUTS (DCD and CTS) MUST BE PROPERLY TERMINATED TO PREVENT NOISE PICKUP. It is especially important to terminate these inputs if a 25 conductor cable is used.

There are two recommended methods for terminating DCD and CTS. The first is to REMOVE (from JA-1 and/or JA-2) the jumpers that connect DCD and CTS to the I/O cable. These jumpers MUST BE REMOVED even if the corresponding pins on the I/O connector are unconnected since even the length of cable from the board to the back-panel connector is sufficient to pick up noise from the system. Pull-up resistors on the board force the inputs to the required active level for proper operation of the board. This method should be sufficient in most cases.

The second method connects the RTS output from the board to the DCD and CTS inputs. Using the output driver (RTS) to hold the handshake inputs at the proper level. Caution: This method will only work if the software initializes the RTS output of the ACIA to the active level. Operating systems supplied by GIMIX (FLEX, OS-9, and UniFLEX) initialize the ACIA properly. Software from other sources, that directly accesses the ACIA, should be checked for proper initialization. There are two ways to implement this method, depending on the type of cable used to connect the board and the peripheral. If a discrete-wired cable is used, jumpers can be installed in the connector at the computer end of the cable, to connect RTS, CTS, and DCD together. (In the case of the jumper configuration shown above, pins 8, 12, and 20 would be connected together) If a mass-terminated or ribbon type cable is used, the jumpers for RTS, DCD, and CTS can be removed from JA-1/JA-2 and wire-wrap techniques used to connect RTS, DCD, and CTS together at the jumper strips.

Printer interfaces normally require handshake to prevent the computer from outputting data faster than the printer can accept it. Software provided by GIMIX uses the CTS input to the serial board for printer handshaking. The CTS input must be connected to an output from the printer that is high (positive level) when the printer is ready to accept data and low (negative level) when it is not ready. The DCD input is not used in this application and should be terminated as described in the preceding section. If printer handshake is not required (if, for example, the baud rate will be set slow enough to prevent printer over-run) the CTS input should also be terminated a described above. Note: Some serial printers require that their handshake inputs (DSR/DCD) be placed in an active state before they will accept data. This can usually be accomplished by connecting an unused output from the printer (DTR) to its handshake inputs, at the printer end of the cable. See the example diagrams below and the printer documentation.

TI-810, etc.

```
COMPUTER                    PRINTER
   3  >--- TX DATA --->  3
  20  <---   CTS   ---<  11
   7  <---   GND   --->  7
                --DSR-->  6
                --DCD-->  8
                --DTR--<  20
```

EPSON MX series, etc.

```
COMPUTER                    PRINTER
   3  >--- TX DATA --->  3
  20  <---   CTS   ---<  20
   7  <---   GND   --->  7
```

NOTE: The above diagrams assume that the 2-port serial board is jumpered as shown in figure "B" of the hardware documentation.

# GIMIX PIA-30 to CENTRONICS TYPE PRINTER INTERFACE

| GIMIX PIA BOARD DB-25 CONNECTOR PIN | SIGNAL | "CENTRONICS" 36-PIN CONNECTOR PIN |
|---|---|---|
| 1 | DATA 0 | 2 |
| 2 | DATA 1 | 3 |
| 3 | DATA 2 | 4 |
| 4 | DATA 3 | 5 |
| 5 | DATA 4 | 6 |
| 6 | DATA 5 | 7 |
| 7 | DATA 6 | 8 |
| 8 | DATA 7 | 9 |
| 9 | ACKNOWLEDGE | 10 |
| 10 | STROBE | 1 |
| 14 THROUGH 25 | SIGNAL GROUND | 19 THROUGH 28 |

NOTE: When using ribbon cable, alternate signal and ground lines for better isolation. When using standard multi-conductor cable, twisted-pairs are preferred, with each signal line paired with its associated ground.
Cable length should be kept to a minimum, with 10 feet being the maximum recommended length.
Shielded cable may be required if radio interference is a problem.

********** IMPORTANT - PLEASE READ **********

# CONNECTION INFORMATION FOR THE GMX™ INTELLIGENT SERIAL INTERFACE

This notice outlines the recommended procedure for connecting serial peripherals (terminals , printers, etc.) to the GMX™ Intelligent Serial Interface board. Failure to follow the recommended procedure can result in random I/O errors caused by noise pickup on unused handshake lines (CTS, DSR, and/or DCD). The errors are most noticeable on interrupt driven systems (OS-9 and UniFLEX) where noise can cause the generation of interrupts that cannot be identified by the operating system.

As shipped, the jumpers on the boards are normally configured as shown below.

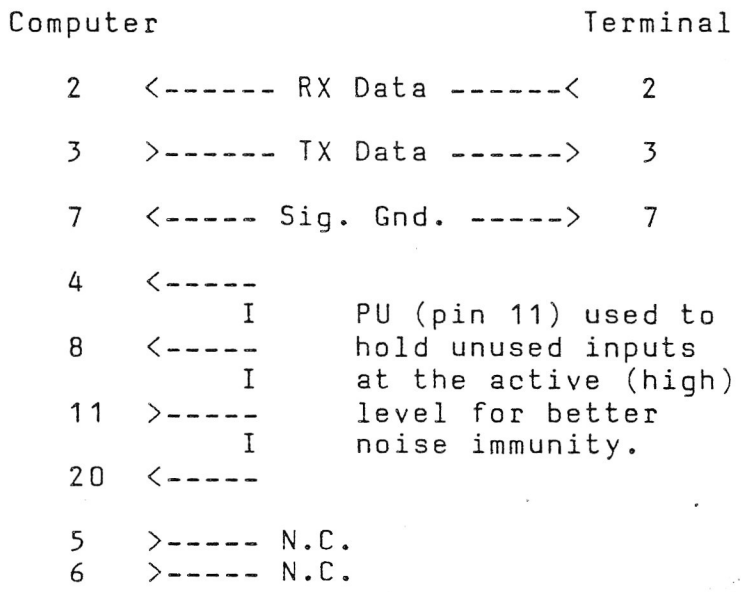
| Signal | Pin # | Direction Computer | Peripheral |
|---|---|---|---|
| RX | 2 | <---------- | |
| TX | 3 | >---------- | |
| CTS | 4 | <---------- | |
| DTR | 5 | >---------- | |
| RTS | 6 | >---------- | |
| GND | 7 | ---------- | |
| DCD | 8 | <---------- | |
| PU* | 11 | >---------- | |
| DSR | 20 | <---------- | |

* PU is an active (high) level output that can be used to hold unused inputs at the active level.

High-speed terminals normally require a simple three wire cable, without handshake, connecting pins 2,3, and 7 of the I/O board to the corresponding pins on the terminal. THE UNUSED HANDSHAKE INPUTS (DCD, DSR, and CTS) MUST BE PROPERLY TERMINATED TO PREVENT NOISE PICKUP. It is especially important to terminate these inputs if a 25 conductor cable is used.

There are two recommended methods for terminating unused handshake inputs. The first is to REMOVE (from JA-5,6,and/or JA-7) the jumpers that connect the unused lines to the I/O cable. These jumpers MUST BE REMOVED even if the corresponding pins on the I/O connector are unconnected, since even the length of cable from the board to the back-panel connector is sufficient to pick up noise from the system. Pull-up resistors on the board force the inputs to the required active level for proper operation of the board. This method should be sufficient in most cases.

The second method connects the PU output from the board to the unused inputs. Using the output driver (PU) to hold the handshake inputs at the proper level. There are two ways to implement this method, depending on the type of cable used to connect the board and the peripheral. If a discrete-wired cable is used, jumpers can be installed in the connector at the computer end of the cable, to connect PU, CTS, DSR, and DCD together. (In the case of the jumper configuration shown above, pins 4, 8, 11, and 20 would be connected together) If a mass-terminated or ribbon type cable is used, the jumpers for PU, DSR, DCD, and CTS can be removed from the jumper areas and wire-wrap techniques used to connect the appropriate pins together at the jumper strips.




Some terminals may require handshake at higher baud rates (usually 9600 and above; consult the terminal manufacturer's documentation). This is usually available in one of two forms, hardware or software (X-ON/X-OFF). If hardware handshake is required the appropriate output from the terminal should be connected to one of the inputs (DSR or DCD) as described in the following section on printer connections. If X-ON/X-OFF is required the standard configuration shown above can be used. Caution: Before using X-ON/X-OFF, check the software documentation to determine if it is supported and if special software configuration is necessary. GIMIX/OS-9 software supports X-ON/X-OFF but it must be enabled by making the appropriate changes to the Device Descriptor(s).

Printers normally require handshake to prevent the computer from outputting data faster than the printer can accept it. Software provided by GIMIX uses either the DCD or DSR inputs for printer handshaking. One of these inputs must be connected to an output from the printer that is high (positive level) when the printer is ready to accept data and low (negative level) when it is not ready. The CTS input should not used in this application and should be terminated, along with the other unused input (either DCD or DSR), as described in the preceding section. If printer handshake is not required (if, for example, the baud rate will be set slow enough to prevent printer over-run) all three inputs should be terminated as described above. Note: Some serial printers require that their handshake inputs (DSR/DCD) be placed in an active state before they will accept data. This can usually be accomplished by connecting an unused output from the printer (DTR) to its handshake inputs, at the printer end of the cable. See the example diagrams below and the printer documentation.

TI-810, etc.

```
COMPUTER                    PRINTER
   3   >--- TX DATA --->    3
 * 20   <---   DSR   ---<   11
   7   <---   GND   --->    7
                  --DSR-->   6
                  I
                  --DCD-->   8
                  I
                  --DTR--<   20
```

EPSON MX series, etc.

```
COMPUTER                    PRINTER
   3   >--- TX DATA --->    3
 * 20   <---   DSR   ---<   20
   7   <---   GND   --->    7
```

* Pin 8 (DCD) may also be used as the handshake input.

Some printers may use software (X-ON/X-OFF) handshake for start/stop control. In this case connection must also be made between pin 2 of the computer and pin 2 of the printer to provide the reverse channel for handshaking. See the software documentation for information on the availability of X-ON/X-OFF.

# SWITCH CONFIGURATION DRAWINGS FOR OS-9 GMX II & III

The following drawings show the standard DIP-switch configurations for the GIMIX 64K RAM board(s), #68 DMA Disk Controller, Hard Disk Interface (SASI), and Mother Board; when used with OS-9 GMX II & III.

The disk controller(s) must be set to both drive and decode extended addressing (both "ENA" switches ON). The motherboard must be set to decode extended addressing. The boards are addressed so they appear only on bank $F (A16, 17, 18, 19 = ON), at the appropriate base address.

The memory boards are addressed for either 64K banks (OS-9 GMX III systems or OS-9 GMX II systems with modified #05 CPU boards) or 56K banks (unmodified OS-9 GMX II systems). The configuration of switch S3 will normally be the same on all boards in the system, with section-7 ON for 64K banks or OFF for 56K. Both extended address enable switches ("XON"-sections 1 and 6) must be "ON" on all boards. The remaining eight sections of S2 determine the bank address of the board. The boards are divided into two halves, with sections 2,3,4, and 5 used to set the bank address for one half and sections 7,8,9, and 10 the other. In this application both halves are set to the same bank address. The switches are set in a binary pattern with section-2(7) being the least significant bit and section-5(10) the most significant. See the drawing for examples. The boards should be addressed on consecutive banks with the first board on bank $0, the second on bank $1, etc.

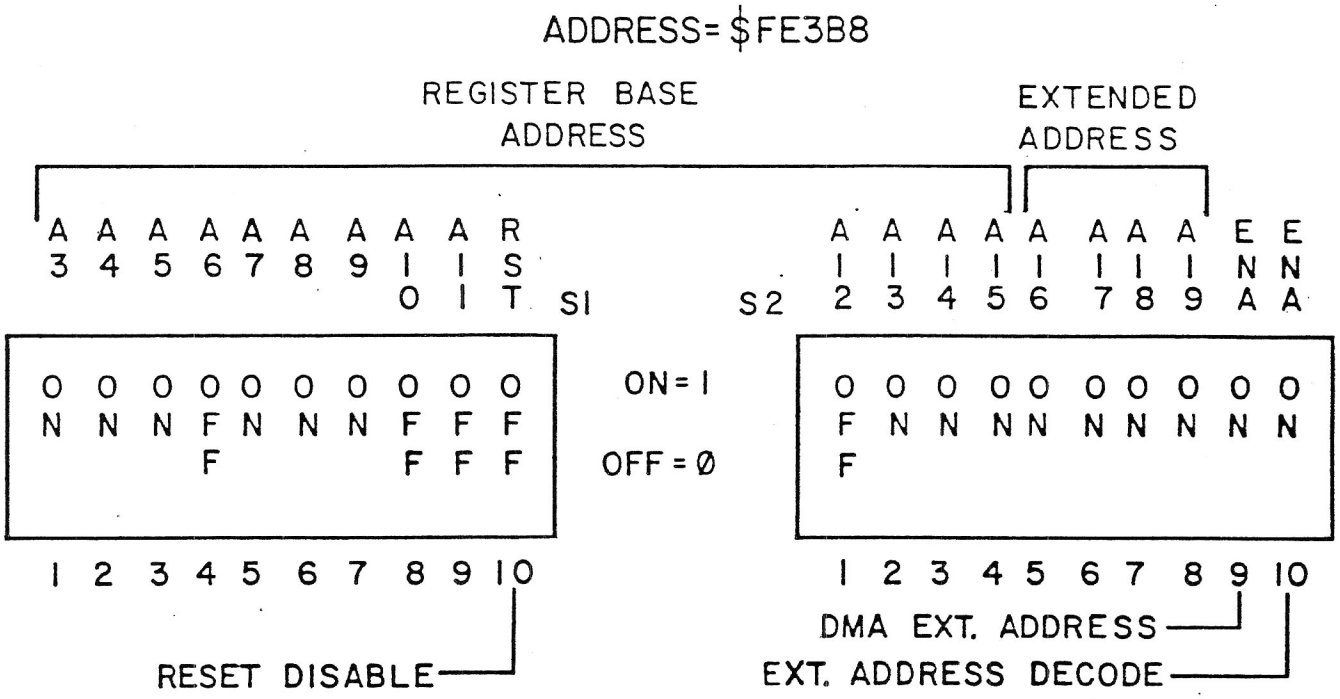
***** CAUTION *****

In addition to the boards shown in the drawings, any other memory-mapped boards installed on the 50 pin bus (GIMIX 8-port Serial Interfaces, Intelligent Parallel Interfaces, PROM/ROM boards, etc.) must be capable of extended addressing. Normally, I/O-type boards must be addressed on bank $F, with a base address in the $E000-$EFFF range. Memory-type boards (PROM/ROM) can be addressed as appropriate to the application, as long as extended addressing is enabled. Note: Standard versions of OS-9 only search the lower 56K of bank $F for PROM/ROM memory modules. In order to be located by OS-9, boards containing OS-9 modules in PROM/ROM must be addressed on bank $F.

***** NOTE *****

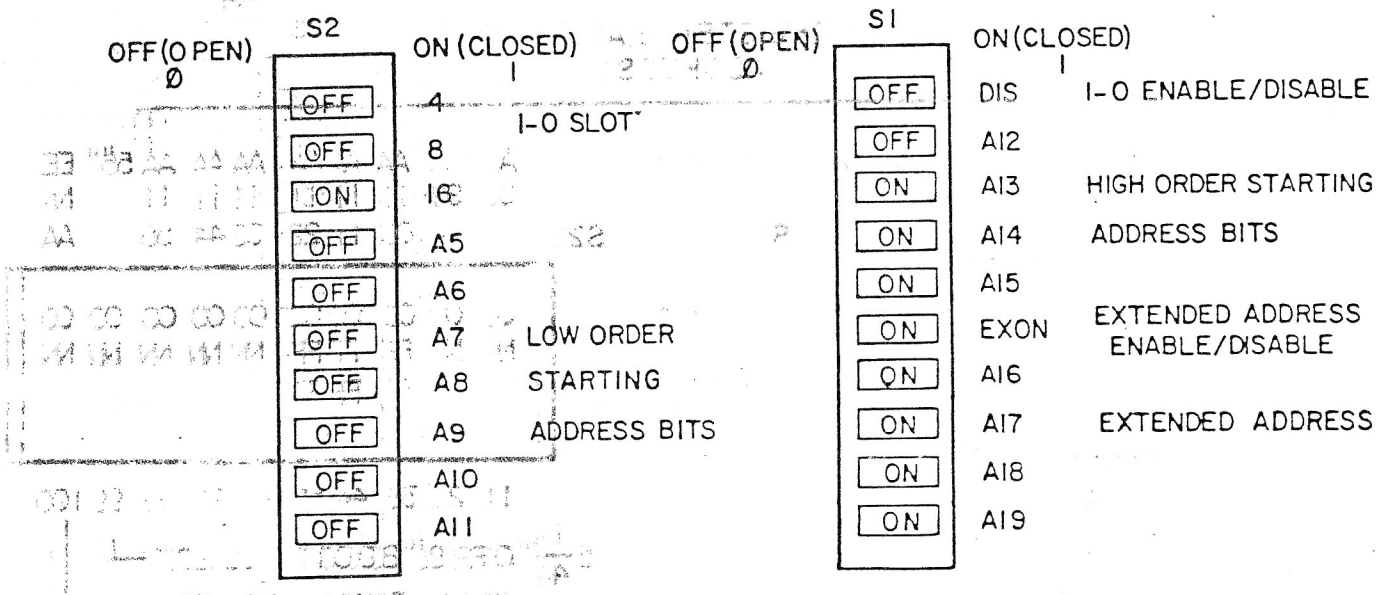
The switch configuration shown for the #68 DMA board assumes that the system will be booted from a 5.25" drive (D0). If D0 is an 8" drive, S2 section-9 must be OFF.

# HARD DISK INTERFACE
# SWITCH CONFIGURATION
# OS-9 GMX II & GMX III




# MOTHER BOARD SWITCH CONFIGURATION
# OS-9 GMX II & GMX III

ADDRESS = $FE000



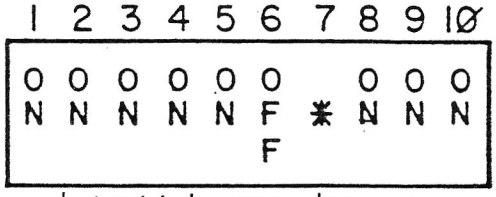
# 64K RAM BOARD
# SWITCH CONFIGURATION
# FOR OS-9 GMX II & OS-9 GMX III

BANK ADDRESS (S2)

| | $Ø | $1 | $2 | $3 | $F | |
|---|---|---|---|---|---|---|
| 1 | ON ← | | | | → ON | XON |
| 2 | OFF | ON | OFF | ON | ON | A16 |
| 3 | OFF | OFF | ON | ON | ON | A17 |
| 4 | OFF | OFF | OFF | OFF | ON | A18 |
| 5 | OFF | OFF | OFF | OFF | ON | A19 |
| 6 | ON ← | | | | → ON | XON |
| 7 | OFF | ON | OFF | ON | ON | A16 |
| 8 | OFF | OFF | ON | ON | ON | A17 |
| 9 | OFF | OFF | OFF | OFF | ON | A18 |
| 1Ø | OFF | OFF | OFF | OFF | ON | A19 |

BOARDS SHOULD BE ADDRESSED ON SUCCESSIVE BANKS - (1ST BOARD, BANK Ø; 2ND BOARD, BANK 1; 3RD BOARD, BANK 2; ETC.)

S3




$ØØØØ-$DFFF ($FFFF)

* ON=64K OFF=56K

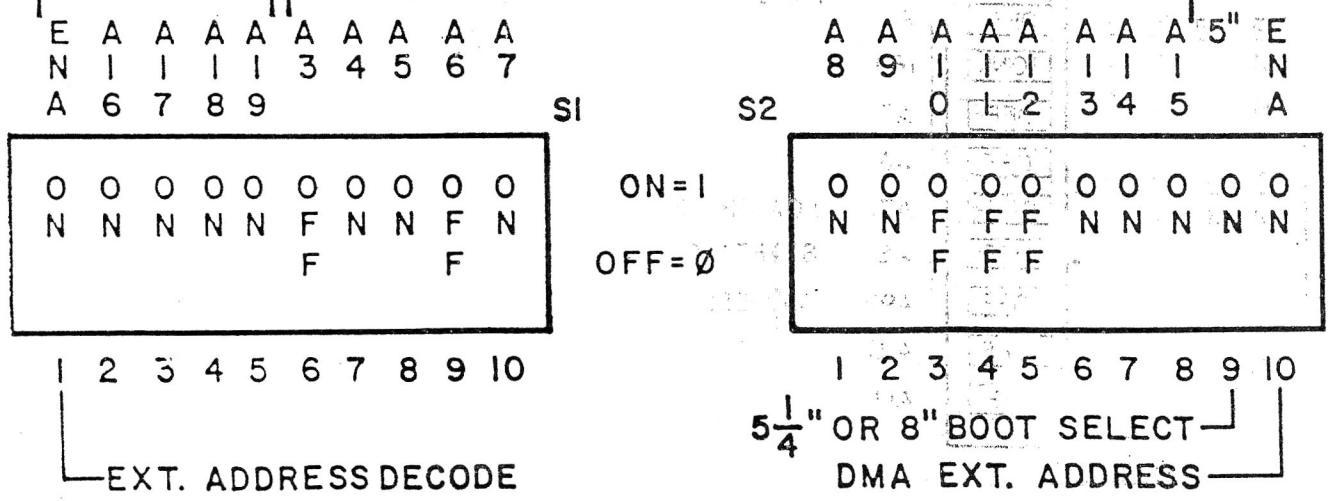
USE 64K FOR ALL BOARDS (EXCEPT BANK $F) IN GMX III AND MODIFIED GMX II SYSTEMS.

USE 56K FOR UNMODIFIED GMX II SYSTEMS.

# DMA FLOPPY DISK CONTROLLER
# OS-9 GMX II & GMX III CONFIGURATION

ADDRESS=$FE3BØ BOOT DRIVE (0)=5 1/4"

EXTENDED ADDRESS — REGISTER BASE ADDRESS



# BAUD RATE CONFIGURATION INFORMATION

## Intelligent Serial and 8-Port Standard Serial Boards

Baud rate clocks for intelligent serial interfaces (3 and 4 port serial I/O processors) and for 8-port standard serial interfaces are produced by baud rate generators on the individual I/O boards. These boards DO NOT use the baud rates generated by the motherboard. To select a specific baud rate, see the hardware and (for intelligent boards) the firmware documentation for the appropriate board(s). The intelligent interfaces may, in certain systems, also allow selection of baud rates under program control. See the I/O Processor firmware documentation.

## 1 and 2-Port Standard Serial Boards

Standard 1 and 2-port serial interfaces use the baud rate clock generated by the baud rate generator on the motherboard. Selection of a specific baud rate for a 1 or 2 port interface, may require configuration of jumpers on both the motherboard and the I/O board itself.

To select a specific baud rate for these boards, the jumpers on the motherboard baud rate generator section must first be configured so that the desired baud rate is connected to one of the five baud rate lines on the bus. Then the jumper or switch on the I/O board must be configured to select the bus line having the desired baud rate.

Note: The baud rate designations on the five bus lines (110,150,300,600, and 1200) are arbitrary and should be used for reference only. The actual rate available from a particular line will vary, depending on the configuration of the jumpers on the motherboard.