PROBLEM/SOLUTION

CS/386

P52

Error P52 on IPL. After selecting OS + PRI specification and setting up IOP 1, 0x FF64, the IPL fails. Mount System Printer at 33240 uses SRRAM 256KB. Motherboard uses A01@32 1632KX16 DRAM.

*1* 27.15 MHz clock one output OFF 5.03 A 500W 520GB 90W 900GB 900W 90W 900W 90W 90W 90W

MOTHERBOARD

S/386

1. Plug in and turn on.
2. Boot from the file system.
3. Enter the system.
4. Set the system configuration.
5. IPL.

Note: The system configuration is set to 32-bit for 64-bit OS.
2200 BASIC COMMANDS

SELECT T ON - ACTIVATES THE DATE/TIME STAMP FOR DISK FILES WHEN SAVING/RESAVING
SELECT T OFF - DEACTIVATES THE DATE/TIME STAMP

LIST SELECT - SHOWS ALL ACTIVE SELECTIONS

SELECT H ON - WILL HOG JUST ADDRESS SPECIFIED \$OPEN #dd + \$CLOSE #dd
SELECT H OFF - DISABLES PLATTER HOG FUNCTION

SELECT NEW - ALLOWS ALL PROGRAMS SAVED TO BE PUT IN 386 FORMAT
SELECT OLD - ALL PROGRAMS SAVED PUT IN STANDARD 2200 FORMAT

SELECT DRIVER 204 - TURNS PRINTER DRIVER IF INSTALLED IN @GENPART ON
SELECT DRIVER 204 OFF - TURNS PRINTER DRIVER OFF

LOAD LOAD LOAD - TO ACCESS MXE COMMANDS
? RETURN
B SYSTEM \# BAUD RETURN \} TO CHANGE BAUD RATE VIA S/W
Y RETURN

\$OPEN!#dd - HOGS ONLY EXACT ADDRESS SPECIFIED
\$CLOSE!#dd - DISABLES HOG TO ADDRESS SPECIFIED
INSTALLING an O/S Fix for VLSI with MDU System

1. POWER UP:
   MDU CPU
   Mount System Platter
   Press Reset
   Key SF.?
   MDU Utility 7/13/81

2. POWER ON
   Development CPU
   Mount System Platter
   Press Reset
   Multiuser BASIC.2
   Standard GenPart
   Ready (BASIC-2) Part 1
   Master Start Up Menu

   Power On
   Reset SF.2 (Addr D21)
   Run (34 O/S)
   (Development partition must be 56k)
   Load Run Ret

2. Initializing the System
   Master Start Up Menu
   Select 'Micro-C ode Development' Run
   Select '2600 Micro-C ode Util' Run
   Select '2600 MDU' Run
   Key SF.15 (Step) if won't stop, reboot sys
   Screen with step at top left & Aux Reg 00-1F shown
   Debug Command?
   Usually will hang here)
   Key SF.15 (step)
   Clear Memory Ret
   Run Ret
   Back to screen with step at top left & Aux Reg 00-1F shown
   Debug Command?
   Debug Command?
   Debug Cmd ? II
   Start Address: 0000
   End Address: 0000
   7DFE Ret (Code in MDU CPU starts at TEOO)
(ADDRESS 7E688 SPECIFIED BY SWITCHES ON MDU BOARD)

INITIALIZE VALUE: 800000

DEBUG Command?

DEBUG Command? ID

START ADDRESS: 0000

END ADDRESS: 0000

INITIALIZE VALUE: 00

DEBUG Command?

DISK ADDRESS: 320

FILENAME: @@

LOADING MULT USER BASIC 2 REL. 3.4

COPYRIGHT WANG LABS :: EOF - LD - DISK ADDR D21

SF'19 (ID INITIALIZE DATA) CLEAR DM

SF'19 (ID INITIALIZE DATA) CLEAR DM

RET (WRTES 0's FROM $7E688)

SF'19 (ID INITIALIZE DATA) CLEAR DM

SF'19 (ID INITIALIZE DATA) CLEAR DM

RET (FIRST 64K USER MEM)

RET

SF'8 (LD LOAD FROM DISK)

D21 RET (ADDRESS WHERE 0'S TO EDIT IS)

CMVP RET

SF'30 (IC SETTING INSTRUCT COUNTER)

SF'30 (IC SETTING INSTRUCT COUNTER)

BACK TO AUX REG SCREEN WITH IC AT TOP LEFT

DEBUG Command?

SEE X X X BELOW X X X CHECK AUX REG 1A (WITHIN AUX 18-1F)

TO CHANGE ADDR

SHOULD BE BOOT ADDR OF MDU CPU (320 IN THIS CASE)

"AUX 18-1F 2000 FFCF 0320 6000 0018 0000 2001 0000"

X X X DEBUG Command?

"2600 EXECUTING"

X X X DEBUG Command?

MDU CPU VERIFY MDU CPU RUNNING BY BRINGING UP TO READY

X X X DEBUG Command?

TO CHANGE ADDR OF AUX REG 1A (DEVELOPMENT CPU)

SF'1 (CR CHANGE REGISTER)

SF'1 (CR CHANGE REGISTER)

DEBUG Command?

DEBUG Command? CR

Reg (CR IF DONE)?

Reg (CR IF DONE)?

VALUE: XXXXX

VALUE: XXXXX

1A RET

0320 RET (BOOT ADDR OF MDU CPU)

RET (IF CORRECT)

VERIFY AUX REG 1A IS SET TO CORRECT ADDR (320 IN THIS CASE)

DEBUG Command?

RETURN TO X X X ABOVE
3. Finding Module in O/S Listing Where Change Was Made
   Identify File Where Change Made
   In this case BPMVP43

   First in Book 1 is a listing by memory location
   Second listing in Book 1 shows order files found in
   Find BPMVP43 by using ORDER in 2nd listing
   Compare code change with listing (should compare excluding changes)

   Compare documented code with code in Development System

   Debug Command? Go
   SF '15 (Step)
   Debug Command?
   SF '6 (LI List Instruction)
   Debug Command? LI
   Address: 0000
   3731 RET (Addr from Listing Where Change Is)

   Code is not the same, does not compare

   - If code did compare which it should of the change should
     be tested before going on to insure fix corrects problem
   - Would need to shut off checksum to prevent errors
     when putting change in
   - If checksum OK & code compares though listing different
     code can be edited & assembled & should work
EDITING THE CODE FOR DEBUG COMMAND

MASTER STARTUP MENU

MICRO-CODE DEVELOPMENT UTIL
SOURCE EDITOR, START UP

INITIALS

WORK DISK D21

NAME FOR LOGON FILE MBA/GE201

DATE 04/22/91

CODE 280

SOURCE EDIT FILE MB.0DPUG6 BP.MVP43 (FILE WHERE CHANGE IS) RET

MUST ADD PERIOD BETWEEN BP & MVP43 NOT FOUND IN ACTUAL FILE

4/22/91 DISK D25

LOAD Y

FIRST SCREEN OF FILE LOADS IN KEY NEXT KEY UNTIL GET TO LINE WHERE CHANGES ARE TO BE MADE (LINE NUMBER AT BOTTOM)

EDITING

USE SPACE BAR TO MOVE CURSOR TO LINE

EXECUTE KEY WILL ADD NEW LINE FOLLOWING LINE CURSOR WAS ON

* KEYED IN 1ST POSITION FOR A COMMENT

MAKE LINE CHANGE

SF'Q LIST OF COMMANDS

SF'1 (ALLOWS OPTIONS TO SAVE, LOAD, CREATE)

(S)SAVE, (L) LOAD, (C) CREATE S S RET (TO SAVE CHANGE)

DISK D61 BP.MVP43 (IN THIS CASE) CHECK FILENAME IS CORRECT

OVER WHAT FILE RET

REPEAT THESE STEPS UNTIL ALL CHANGES MADE

SF'16 (TO EXIT)

DO YOU WANT TO LOG OFF Y RET

MASTER STARTUP MENU (CHANGE HAS BEEN MADE, NOW MUST BE ASSEMBLED)
(6) Assembling the code with the changes made

Master Start Up Menu
Micro-code Development Util
2600 Development Util
Operator's Initials
Assembler Output
Source Edit File B60
External Symbol Files
Object File
Block Work File
File Names:
Object File MBOBJCTC

MVP C (must already exist & be approximately 500 sectors) RET

Block Work File MBWK.TMP
Starting Module Name MBLIST 22MVP RET (all instructions to do compile)
Date & Title: 4/22/91 Add release number & patch made. RET
Do you want the code in order? Y N RET (faster & works)

Takes 3 to 4 hours to assemble

When finished will come back with message:
1 Disk Error: This Assembly (in this case had 1 soft disk error)
No Errors or Warnings
STOP - End of Assembly

Go back to step (2) & Initialize memory & Reload new code

(6) Calculate Check Sum
Debug Command?
Debug Command?
Debug Command?
SF'15 (Step)
SF'4 (Calculate Checksum)
SF'38 (GO MIX, CPU running)
2600 EXECUTING... (AT TOP OF SCREEN)

3 TEST FIX ON MDU CPU
   - AFTER KEYING SF'31 AS LAST STEP OF 1, GENPART SHOULD HAVE
     COME UP ON MDU CPU
   - BRING CPU UP FROM THIS GENPART AND VERIFY FIX TO
     O/S THAT WAS EDITED IN AND ASSEMBLED (5 & 6) CORRECTS
     THE PROBLEM IT WAS EXPECTED TO FIX.

4 IF FIX IS GOOD, SAVE IN STANDARD O/S FORMAT
   DEVELOP CPU DEBUG COMMAND? SF'15 (STEP)
   DEBUG COMMAND? SF'24 (SAVE DATA) SD
   DEBUG COMMAND? SD
   DISK ADDRESS: D21
   FILE NAME: CMVP (4 CHAR. MAX) CMVP RET (WILL WIPE OUT FILE OF SAME NAME.
     IF EXISTS, MAY USE DIFFERENT NAME)

   IF FILE DOES NOT EXIST WILL TELL YOU.
   SIZE OF NEW FILE: 500 RET (500 SECTORS ALLOTTED)
   M = 32K MVP (D:0000-0BFF, I:0000-7DFF) V = VP
   M = MVP (D:0000-0BFF, I:0000-65FF) b = 64K BASBOL
   C = EDIT COMMENT C = COMMENT I = INSTRUCTIONS D = DATA E = EOF
   SAVE WHAT? C RET (ALLOWS COMMENT TO BE MADE)
   COMMENT:(C) COPYRIGHT, WANG LABORATORIES, DATE RET
   SAVE WHAT? C D RET

   ... RECORDING DATA...
   START ADDRESS: 0000
   END ADDRESS: 0000
   SAVE WHAT? C RET
   OBFF RET (SAME AS DEFAULT)
   I RET

   ... RECORDING INSTRUCTIONS...
   START ADDRESS: 0000 RET
End Address: $0000$

66FF RET (CHANGE FROM DEFAULT OF 65FF, NO LONGER BIG ENOUGH)

IF INSTRUCTION END ADDRESS NOT LARGE ENOUGH, THE SAVE WILL APPEAR TO WORK OK, BUT WILL GET PECM ERROR WHEN TRY TO BOOT FROM THIS CODE. SAVE WHAT? C

...RECORDING EOF.

File Complete ***

SD Disk Address: D61 SF' 31 (GO COMMAND)

2600 EXECUTING...

DEBUG COMMAND? RESET

READY (Basic-2)

10 MOVE NEW CMVP FILE TO O/S DISK TO TEST ON MDU SYS

MOVE NEW CMVP FILE TO DISK TO BOOT MDU SYSTEM FROM

11 IF IN STEP 10 NEW FILE CALLED CMVP WILL NEED TO RENAME CURRENT CMVP ON BOOT DISK OR USE CMOVEFIL UTILITY

12 IF GAVE NEW FILE UNIQUE NAME CAN MOVE TO BOOT DISK WITH MOVE & TYPE IN 4 CHARACTER NAME AT KEY SF? SCREEN, THEN SF' KEY CORRESPONDING TO DISK ADDRESS.
Test Machine Where Code Runs (MDU Card)

Key SF: CMDU PF 2 (320)

Development Sys  Microcode Development
2600 Microcode Utilities
2606 MDU "2600 Executing"

Key SF 15 (ST61)

Debug Cmd 15(ST61) (usually will hang here)
RESET
CLEAR
RUN

Debug Cmd: SF'23 (initialize instruction) CLEAR CM
Start Addr 0000
End Addr 7DFF
Code in MDU machine starts at 7E00 (specified by SW's on MDU)
Init Val 80000000 (default) RET

Debug Cmd: SF'19 (initialize data) CLEAR DM
Start Addr 0000
End Addr FFFF
1st 64K useful mem
Init Value 00 RET (default)

Debug Cmd: SF'8 (load from disk) (LD)
Disk Addr D21 (address where 3.4 resides) will soon loading rel 3.4 to screen
File Name EMPF (RET)
SF'30 IC setting instruction counter (should be 0003)
Check AUX reg 1A (within 18-1F) should be boot addr of MDU's
(320) active device

GenPart screen should now reside on W/S of MDU machine
Verify MDU machine running (brings up to read by loading a config)
2600 Micro Code Util
Block Assembler

Opclnt init any initd. ret

asm out 000 215 can be used for printout
source edit D61
ext sym file D61
obj file D61
blk work file D61

obj file MVP (must already existing & be approx 500 sect)
blk work file BPWK.TMP

Start module name 22MVP (all instructions to do compile)

Date & Title 4/22/1971 rel 3.4 & limit patch ret

Do you want code in order? N faster & works ret
Takes 3-4 hours to compile

Message

When completed:
1 Disk Errors This Assembly (Assumed to be soft error)
No Errors or Warnings

Stop - End of Assembly

Initialize Memory & reload new code
Same as beginning

Calculate Check Sum
Debug Command SF'4

Try it
Test Fix on MPU CPU

If OK now will save in standard o/s format

* * * SF'15 to put in step
Debug Command SD SF'24 save Data
Disk Address 061 Work Disk
File GNDA Will wipe out existing file if already exists.
Size of File 500 Should verify size (500) OK
Save What? C Comment
Comment CS/2200 OS/Sys 3.4 + Limits (seen when loading) Ret
Save What? C
Comment Copyright etc. from Ret
Save What? M For MVP (Save constants & instructions) DEFAULT FOR STANDARD MVP BIT NO
Saving MVP
RECORDING

Move new OS file to MDU CPU
MOVET/D61

Got PCM error trying to load GNDA Load 2600USD
Defaults were not big enough for file Does not tell you when saving
Change NOT BIG ENOUGH
EA = HEX (65 FF)
To
EA = HEX (66 FF)
ESAVE T: 2600USD

Save What? D (Data)
Start Addr. 0000
End Addr. 0BFF (same as before)

Save What? I
Start Addr. 0000
End Addr. 66FF (Change from DEF CT of 65FF) Ret

Save What? E (End of file)
File Complete

Debug Comm? 60 SF '31
2600 Executing

Procedure to Convert 2200 PROM Data Files to the PC MS-DOS File Format

A 2200 PROM data file is formatted in 240-byte records. Many of the files include 16 "space" filler characters. Each record identifies the record type (comment or data) and includes a record byte count, record checksum, record start address, and record data. This particular record format is dictated by the way that the 2200 programming system handles files. In order to be acceptable to the PC PROM programming system, this data must be reorganized into a different file format.

The following procedure describes the specific method which may be used to translate 2200 PROM data files which are loaded on 8-inch floppy diskettes in the VS file format to the PC MS-DOS file format:

6.5.1. Log on VS system at an archive workstation.

6.5.2. Run the COPY2200 program.

6.5.3. Press function key PF1 to select the function to create VS files from a 2200 diskette.

6.5.4. Press function key PF4 to mount the 2200 diskette. A suggestion for the diskette name, which serves to identify its contents, is to use either NL0001 or the last 5 digits of the data file part number of the file resident in the diskette. For example, 378-9037 gives "89037" for the name of the diskette.

6.5.4.1 Specify the device number (for the floppy disk drive).

6.5.4.2 Select mode L and select the appropriate file(s), then press RETURN.

6.5.5. Respond to the queries for the library and volume on the VS system where the 2200 files are to be loaded.

6.5.5.1 Specify the type of file (type "F", consecutive fixed-length) and the size of the records (256 bytes), then press RETURN.

6.5.6. Specify the output format for 2200 numeric values as type "D" (decimal) and press RETURN.

The system then reads the file and converts it to a VS file.

6.5.7. Dismount the diskette, then logoff.

6.5.8. Log off the archive workstation on the VS system after the files have been transferred from the 2200 diskette to the VS system.

6.5.9. Run the terminal emulation software to log on the VS system from your PC.
6.5.10A. If the Data Exchange Utility (DATACON.EXE) is on a virtual file, mount the PC virtual file resident on the VS system using the PC/VSServer Utility (VSACCESS). Indicate the VS file, library, volume, and mode (READONLY) for the PC/VSS Data Exchange Utility (datacon) and suspend emulation.

6.5.10B. If the Data Exchange Utility (DATACON.EXE) is on your hard drive, leave all VSACCESS fields blank and suspend emulation to leave VSACCESS active.

6.5.11. Run the datacon program from the BIN subdirectory of your PC virtual disk or from the directory on your hard disk. Specify the source data file as a "VS Consecutive File" and the destination data file as a "PC Stream File" and press EXECute. Enter the pathname of the source file on the VS system and the pathname of the destination file on the PC and press EXECute. The file will be transferred and converted to a PC stream file.

6.5.12. Dismount the PC virtual disk when you are done.

6.5.13. Run File Formatter which is a menu pick found under PC PLD Programming Utilities by running run_pps.bat.


6.5.15. Continue at section 5.1.2 in this document.