LISA BOOT ROM
MANUAL

VERSION 1.0

Rich Castro
20 June 1983
Init Exception Vectors
Init Interrupt Vectors

Init Jump Tables

NMI Handler

Check MMU for Warm or Cold Start (126)

Warm - Set few MMU
Set contrast, clear errors

Colder - Check MMU (127)

Set some MMU
Turn Contrast off

Start Diagnostics

Checksum test of Boot ROM
Pass
Fail
Error, hang up on spin

Read/Write test of MMU registers
Pass
Fail

Address test of MMU registers
Pass
Fail

Setup MMU to default values, write then read check
Pass
Fail

Setup MMU contexts 1,2,3 and flag errors in memory
Pass
Fail
Flag errors in memory

Size memory, assume 128K increments, check for low
Pass
Fail
Check if I/O board there
Pass
Fail
Beep, Hang in a debug loop

Size memory, assume 128K increments, check for high
Set MMU according to addresses found

Test first 2K of memory
Pass  Fail
Beep, Hang in a debug loop

Save current information in low memory
Initialize exception vectors in low memory

Parallel Port VIA tests

See if Timer 1 is there
Pass  Fail

See if can access other register

Do test of timer register
Pass  Fail

Set fail flag

Test memory to be used for screen
Pass  Fail

Set fail flag, get new screen area

If inverse video, set last bits for no retrace line

Draw desktop, CPU ROM rev, set contrast to default

Test of Keyboard VIA

Test timer register
Pass  Fail
TSTCHK

Enable COPS
Pass  Fail
TSTCHK

Scan COPS for proper reset codes
Figure if keyboard & mouse connected
Pass  Fail
TSTCHK
Pass Feil

Verify VTIR signal

Read system serial number

Parity Circuitry test, test 1 address by writing wrong parity and then writing with normal parity

Full memory test w/parity enabled

Check if Warmstart or not

Memory tests with parity off

Address Uniqueness Test PingPong Memory Test

Memory tests with parity on

RS232 / SCC tests

Channel A Interrupt vector register test

Channel B Internal loopback test
Test of disk interface

- Display ROM I.D.
- Check of DSKDIAG bit
  - Get disk ROM test status from shared memory
    - Pass
    - Fail
      - TSTCHK
- Write/Read test of 1 location in shared memory
  - Pass
  - Fail
    - TSTCHK
- Issue disable command to disk ROM
  - Pass
  - Fail
    - TSTCHK
- Scan keyboard COPS for user commands
- Read COPS for current date and time
  - Pass
  - Fail
    - TSTCHK
- Highlight I/O expansion slot icon
- Read all expansion slots for I.D.s
  - On cards with status programs, execute them.

TSTCHK

- Clear desktop
- Any fatal errors encountered?
  - Yes
    - If CPU select error, then display it and hang in loop of parallel port via
    - If CPU MMU error, then display it, beep, and go to boot ROM monitor
  - No
If CPU video error, then display it
Beep & go to Boot ROM Monitor

else must be Parity circuit error, then display it
Beep & go to Boot ROM Monitor

See if an Exception error occurred

No

Yes

Beep & go to Boot ROM Monitor

See if I/O board error occurred

No

Yes

If keyboard VIA error then go to VIA test and loop there.

If parallel port VIA error then
Beep & go to Boot ROM Monitor

If COPS error then go to
COPS test and loop there

If clock data or RS232 error then
Beep & go to Boot ROM Monitor

If Disk I/O except or COPS error then
Beep & go to Boot ROM Monitor
See if keyboard error occurred
Yes
No
VIA test and loop there.

See if memory error occurred
Yes
No
Beep, display which board and go to Boot ROM monitor.

Must be I/O expansion slot error

If keyboard unplugged then flag user.

If mouse unplugged then flag user.

Init cursor and mouse.

Alternate Boot device?
No
Yes

Boot menu asked for?
Yes
No
Get boot device from parameter memory
Invalid
Valid
Default to profile

Keyboard overrides all others
Is there a bootable test card?
  Yes  No
Is bootable card an AppleNet Card?
  No  Yes  Boot from AppleNet
Bootable Test card?
  No  Yes  Boot from Test Card
No override of default

If Twiggy (871) boot then go to special routine.
If Profile boot then go to special routine.
If parallel card boot then go to special routine.
For Power cycling, special code.
Go to Boot ROM monitor
Boot from Profile

Diagram:
- Display Wait Alert
  - Init Parallel Port
    - Read Sector
      - OK
        - Verify File I.D. code
          - Error
          - OK
            - Init exception vectors, just in case.
        - Error
          - Display Error
            - Go to monitor for new boot device
            - Go do Boot
Floppy disk Boot

Display Wait alert

Enable drive

Error, timeout

FDIR present?

Yes

Clear interrupts

Read sector 0, track 0

Timeout

OK

Other

Does File I.D. say bootable?

No

Read sector 0, track 1

Error

OK

Yes

Read sector 0, track 0

Error

OK

Does File I.D. say bootable?

No

Yes

Setup exception vector, just in case.

Send reset signal, keyboard reset

Clear reset

Clear first byte of keyboard queue