FIELD DIAGNOSTIC PROGRAMS

Diagnostic Characteristics

- Menu driven
- Failures displayed
- Hidden functions (such as monitor mode funtions)
- Command line:

/SA=	stand alone mode
/L#=	loop or repeat mode
/M=	monitor mode /CONFIG
/S5/E6=	test limiters

Diagnostics Which Just Verify

- ROMCHECK
- APPSCHK
- NCONFIG CONFIG
- KEYTEST
- DISPLAY
- PRNCHECK
- CHK8087

ROMCHECK

Test Function:

- **Checksums the boot ROMsm and any user ROMs on the expansion bus**
- **Displays the ROMs date codes**

Results:

- **Pass/fail**
- **ROM date codes**

APPSCHK

Test Function:

- **Tests application ROM sockets for presence of ROMs**
- **Identifies and checksums present application ROMs**

Results

"EMPTY ROM SOCKET":

no ROM found in socket

"ROM ERROR!!":

detects ROM in socket but of the incorrect format

"CHECKSUM ERROR!":

ROM in socket fails checksum

"UNKNOWN ROM":

ROM is currently formatted and passes checksum, but the test can't identify the ROM. This is not necessarily a failure

NCONFIG CONFIG

Test Function:

- Verifies the operation of the system options
- Checksums and identifies application ROMs

Results:

- Displays present system options
- Displays all failures
- Beeps and freezes on failures

Model Options for Python/Cobra 1520 and 1530

280	Yellow LCD	310	Dual Floppy	341	80387 1530 Math Coprocessor
281	9.4" Plasma 640x200	320	10MB HDD & 1.44MB 3.5" FDD	344	40MB HDD (1/2 ht) & 3.5" FDD
282	10" Plasma 640x400	321	20MB HDD & 1.44MB 3.5" FDD	370	MS-DOS ROMs3.21
283	Blue LCD	324	40MB Hard Drive	371	MS-DOS 3.21/XTalk ROMs
287	LCD(VGA)	325	100MB Hard Drive	372	MS-DOS 3/3
301	1MB RAM	330	1200 Band Modem	373	MS-DOS 3.3/XTalk
302	2MB RAM	331	2400 Band Modem	376	Crosstalk ROM
304	4MB RMA	332	MNP 2400 Band Modem	382	MS-DOS 3.21
308	8MB RAM	340	80287 1520 Math Coprocessor		

KEYTEST

Test Function:

- Verifies the operation of the internal and exteranal keyboard

Results:

- Beeps on incorrectly received scancodes
- Indicates when all keys have been tested

DISPLAY

Test Function:

- **Facilitates inspection of the display for the following symptoms:**
- **Blacked out pixels, vertical and horizontal lines**
- **Permanently turned on pixels, vertical and horizontal lines**
- **Bleeding between pixels, vertical and horizontal lines**
- **Half-lit pixels**
- **Ghosts on the display, or screen hysteresis**

PRNCHECK

Test Function:

- **Verifies correct data transfer bewteen the system and a printer**

Results

- **Prints the following charaters 5 times:**

ABCDEFGHIJKLMNOPQRSTUVWXYZ1234567890-+ +?;:!@#$%^&*()

DISPLAYS PROMPT, "ERROR TRYING TO INITIALIZE PRINTER!!"

CHK8087

Test Function:

- **Tests for the presence of 802087 or 80387 coprocessor**
- **Verifies performance and accuracy of the coprocessor**

Results:

- **Not installed/pass/fail**

Diagnostics Which Return Error Data

- SPKRCHK
- RAMTEST

SPKRCHK

Test Function:

- Verify operation of speaker

Results:

- Dsiplay error message if speaker control circuitry fails
- Operator must verify warbling, strutting, and silent phases of speaker operation

RAMTEST

Test Function:

- **Tests write and read function of system RAM (firs 640KB)**

Results:

- **Displays first error**

(Note: system must be reset after test)

Diagnostics Which Return Detailed Error Data

- VIDEORAM
- PRNLOOP
- CLOCKTST
- SIOLOOP
- MODEMTST
- MEDIACHK

VIDEORAM

Test Function:

- Writes and reads to the video RAM

Results:

- Displays errors encountered
- Jumps into monitor mode on error

PRNLOOP

Test Function:

- Verifies operation of status, control, and data registers of the line printer interface
- Loops on test 100 times

Results:

- Jumps into monitor mode on error
- Displays expected and actual data received during test

CLOCKTST

Test Function:

- **Tests internal register of real time clock chip**
- **Sets time in real time clock chip**

Results:

- **Displays error encountered in reading and writing to RTC registers**
- **Allows user to set time**
- **Jumps into monitor mode if error ocurs**

SIOLOOP

Test Function:

- **Tests the internal registers of the serial controller (COM2)**
- **Tests the serial control lines 9RTS,CTS,DTTR,DSR,RI ...)**
- **Tests the transmit and receive lines for variable baud rates**

Results:

- **Jumps into monitor mode if an error occurs**
- **Display error, actual and expected data**

MODEMTST

Test Function:

- **Should only be used with the /SA parameter in the field**

Results:

- **Jumps into monitor mode is an error coours**
- **Displays error, actual and expected data**

MEDIACHK

Test Function:

- **Tests reading and writing to the internal disk drive with 6 sub-tests:**

1. **Access test (random read and write)**
2. **Free disk space (tests unused sectors)**
3. **Sequential read (of all sectors)**
4. **Sequential write (of all sectors)**
5. **Random read**
6. **Random write**

Results:

- **Displays error sector location on disk**
- **Displays error type**
- **Jumps into monitor mode on error**
- **Use monitor mode to select between drives**

FIELD DIAGNOSTIC LAB

Diagnostic Lab

1. Make sure the following peripherals are attached to the system:
    a. RS-232 serial loopback connector
    b. Pocket peripheral
    c. Centronics loopback connector
    d. External power supply
2. Place the diagnostic disk in the internal floppy drive
3. Turn the system on. Press the "F" key after the system beeps
4. Enter the time and date as directed
5. Type @BURNIN.BAT on the command line and follow any instructions displayed

Disassembly/Reassembly Lab

1. Disassemble the system following the procedure in the Mantenance Manual

2. Reassemble the system following the procedure in the Maintenance Manual

3. Test the unit using @BURNIN.BAT on the diagnostic disk

EXTERNAL THEORY OF OPERATION

What is the External Peripheral Bus?

- Extension of the internal FDD bus
- Consists of the following :
  - Power
  - Servo control
  - Drive and head select
  - Read and write data, and write enable
  - Precompensation
  - Drive status
  - TTL compatible

The Pocket/Pouch Peripherals

- 32170: 720KB

  3.5" floppy drive

- 3401: 1.44MB

  3.5" floppy drive

- 3402: 360KB

  5.25" floppy drive

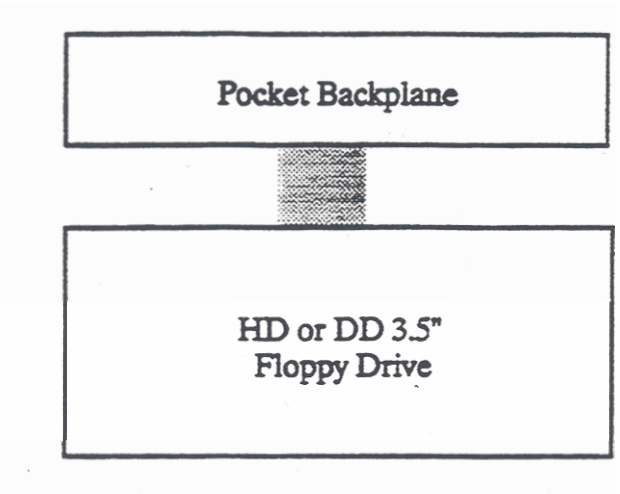
- 3403: 40MB

  streaming tape drive (BACKEZ only)

- 3404: 1.2MB

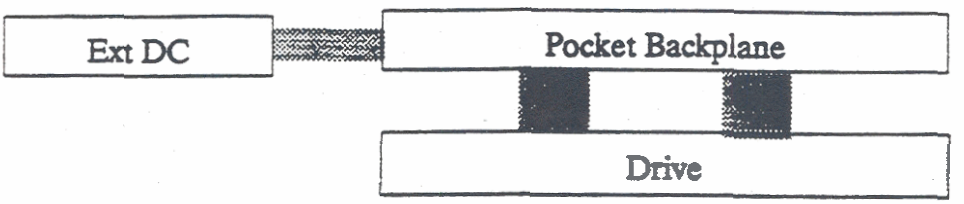
  5.25" floppy drive (XENIX)

Pocket Floppy Block Diagram



- **Backplane select switches wired in parallel**
- **Jumper J1 (high density select)**

Pouch Drive Block Diagram



- Backplane's 12V and 5V regulators require +16VDC to operate
- Jumpers J1 (high density select) and J2 (tape drive present)
- Drive signal and power cables vary between peripherals

Repair Philosophy

GRiD's Field Repair Viewpoint

- Field repair takes place at the sub-assembly level
- The VIRT technique
- Performing sub-assembly updates

Component Level Repair Policies

- GRiD does not actively encourage component level replacement in the field
- Evidence in the repair center of field component replacement will be regarded as "mishandled"
- Replacement of socketed components is acceptable

VERIFY

IDENTIFY

REPLACE

TEST and BURN-IN

Workshop Evaluation Form

Directions:

Please circle the numbers and complete the sentences below. Select the answers which best describe your experiences in this workshop.

1. ***Was the new information accurate and effectively presented?***

   High ——— Low

   7 6 5 4 3 2 1

2. ***Did you get enough hands-on experience with the computer?***

   High ——— Low

   7 6 5 4 3 2 1

3. ***How well did the workshop meet your expectations?***

   High ——— Low

   7 6 5 4 3 2 1

4. ***How much more effective do you expect to be, on the job, as a result of this workshop?***

   0% 5% 10% 25% 50% 100% 200% 400%

5. ***How much more productive do you expect to be as a result of this workshop?***

   0% 5% 10% 25% 50% 100% 200% 400%

6. ***What part of the workshop was the most interesting to you?***

7. ***What part of the workshop will you use the most when you get back to your job?***

8. ***How does this workshop compare with others you have taken?***

9. ***Would you recommend this workshop to others in your organisation? Why?***

10. ***How does the workshop rate, overall?***

    High ——— Low

    7 6 5 4 3 2 1

Workshop Title: GRiDCASE 1500 Hardware Service Course

Attendance Dates:

Company Name:

Participant Name:

Instructor Name: