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Description - This section contains an overview of the laptop troubleshooting and configuration software used with the SSM in the RF/PEN 2, RF/PDU, SRF, or GRFD cabinets.

1 - OVERVIEW

Two programs are intended for troubleshooting the SSM, using the standard GE issue laptop computer. These programs are:

- CPD.EXE Version 2.0
- MONS1.EXE Verison 2.2

Both of these programs are compatible with all SSM types. This is not true of the earlier versions of these programs on the Revision 11 and earlier 8.X Service Methods CDROM. The earlier versions were not compatible with 0.7T SSMs. The new programs can be run from the CD-ROM, or they can be copied to and run from the hard drive.

These programs require an IBM PC compatible computer or laptop with:

- DOS 5.0 or later; or Windows 95/98
- 1.0MB of RAM
- VGA monitor
- RS-232 serial port

THESE SOFTWARE PROGRAMS MUST NOT BE RUN FROM A WINDOWS MS-DOS SHELL. IT IS NECESSARY TO RUN THESE PROGRAMS IN MS-DOS MODE. REBOOT THE LAPTOP INTO MS-DOS MODE BY SELECTING "START", "SHUT DOWN", AND "RESTART IN MS-DOS MODE". ATTEMPTING TO RUN THESE PROGRAMS FROM A WINDOWS MS-DOS SHELL WILL RESULT IN THE PROGRAMS OPERATING ERRATICALLY AND DISPLAYING FALSE INFORMATION.

These programs communicate via the auxiliary serial port (J46) on the system support module (SSM) of the cabinet.

Prior to running any of the programs, set up the communications port of the computer, and connect a null modem serial cable between the laptop and J46 on the rear of the cabinet.

Verify that there aren't any programs, such as PDA syncing programs, running in the background that take exclusive control of the PC laptop serial port.

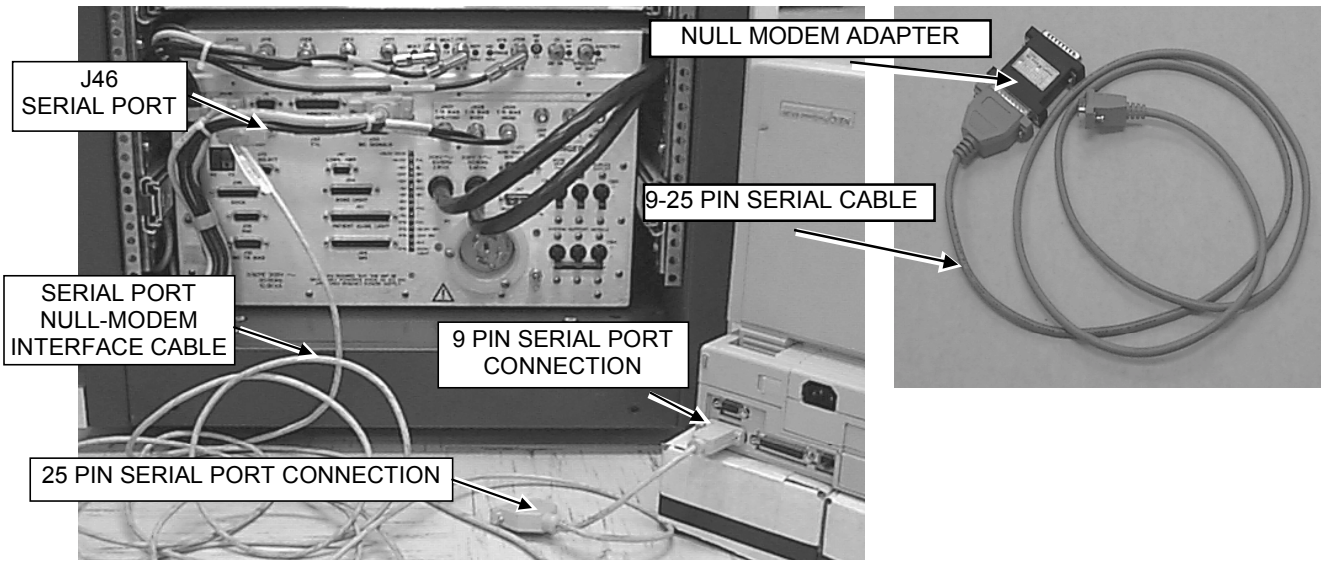
To set up the communications port COM1 of the laptop; open a DOS prompt by clicking **[Start]**, **Programs**, and **MS-DOS Prompt**, at the DOS prompt type:

MODE COM1:9600,N,8,1

This sets up COM1 for 9600 baud, no parity, 8 data bits, and 1 stop bit.

1 - OVERVIEW (continued)

Use the serial port interface cable that is supplied with every cabinet, part number 2124497-46 (shown in Illustration 1-1), for the connection between the laptop serial port and the cabinet. If this cable is not available, a null modem cable adapter and standard serial cable can instead be used. See Illustration 1-1.



LAPTOP CONNECTED TO SSM
ILLUSTRATION 1-1

The following error message will print if a serial communications error occurs in any of the programs:

An RS-232 serial error has occurred
Check the manual for the correct cabling and then check the cabling
Please press a key to continue, 'esc' to exit to DOS

If you receive this message, check the RS-232 serial communications hookup between the laptop and J46 of the SSM. The connections should look similar to Illustration 1-1. Check to see that the cabinet is powered on (breaker CB4 on the rear of the SSM is on).

1 - OVERVIEW (continued)

Run MONS1.EXE or CPD.EXE from the Rev 12 or later **8.X Service CDROM** as follows:

Insert the CD-ROM into the drive. Under Windows 95/98 use the cursor to select "**Start**" and then "**Run**" and then "**Browse**". Select the CDROM drive from the down arrow to the right of the "**Look in:**" entry box in the "**Browse**" menu. In the edit box type the following (include the quotes):
"d:\mrtools\Setup.exe"

Follow the setup program instructions to install the tool onto the laptop. These programs must be run in MS-DOS mode and not from a Windows DOS shell. In Windows95/98 perform the following steps:

1) **[Start]**, **[Shut Down...]**, **Restart the computer in MS-DOS mode?**, **[Yes]**

Note
It may take up to 1.5 minutes for some Dell laptops to restart in MS-DOS mode.

2) At the C:\Windows> prompt, type **cd \cclass\rftools** <ENTER>

3) At the C:\CCLASS\RFTOOLS> prompt type **cpd.exe** or **mons1.exe** <ENTER>

Run MONS1.EXE or CPD.EXE from the **OpenSpeed Service CDROM** as follows:

Insert the CD-ROM into the drive. Under Windows 95/98 use the cursor to select "**Start**" and then "**Run**" and then "**Browse**". Select the CDROM drive from the down arrow to the right of the **Look in:** entry box in the "**Browse**" menu. In the edit box type the following (include the quotes):
"d:\mrtools\Setup.exe"

Follow the setup program instructions to install the tool onto the laptop. These programs must be run in MS-DOS mode and not from a Windows DOS shell. In Windows95/98 perform the following steps:

1) **[Start]**, **[Shut Down...]**, **Restart the computer in MS-DOS mode?**, **[Yes]**

Note
It may take up to 1.5 minutes for some Dell laptops to restart in MS-DOS mode.

2) At the C:\Windows> prompt, type **cd \cclass\rftools** <ENTER>

3) At the C:\CCLASS\RFTOOLS> prompt type **cpd.exe** or **mons1.exe** <ENTER>

1 - OVERVIEW (continued)

Each program comes with command line options that are described later.

Each of the two programs is useful for troubleshooting the SSM in different ways.

CPD.EXE is useful for observing front panel display information without having to remove the cabinet front cover and view the SSM LEDs. It also allows the user to configure any part of the SSM without having to manipulate any of the SSM front panel DIP switches.

MONS1.EXE is useful for interacting with the SSM power monitors. It can be used during power monitor tests for viewing power levels and fault conditions. It can also be used to troubleshoot problems associated with the power monitors.

2 - CPD.EXE REVISION 2.0

This program is useful for configuring and debugging the communications pin driver board (CPD board) in the SSM. Any information that is normally displayed via the LED banks #1 or #2 on the SSM front panel can also be displayed viewed through this program.

This program can be used for the following special operations:

- View EEPROM variables
- Run self-test of the system
- Set DD open circuit tolerance
- Change RF amp AFT status (Erbtec amplifier only)
- Change RF amp tube serial number (Erbtec amplifier only)
- Change Multi-coil configuration (0-4 Multi-coils present)
- Change power monitor type (0.5T, 0.7T, 1.0T, 1.5T)
- Change PAC power supply voltage (8V, 9V)
- Adjust Multi-coil and TR circuits (requires opening the SSM to adjust pots)
- Create a test unblank signal
- Remove test unblank signal

It also shows current pin driver (TR, DD, Multi-coil) information and current front panel configuration and information.

Several command line options can be invoked to make the program more useful as a debugging tool. If no command line options are specified, the default mode is invoked. The command line options are as follows:

SYNTAX: CPD {/? /(D,A) /(1-4)}

Where:

/? = syntax help
/D = debug communications on
/A = auxiliary port communications
/(1-4) = laptop serial communications port (COM1-COM4)

The default mode is: CPD /A /1

The /D option is useful only if there is no cabinet present. It shows what is available via the program. This is useful for training purposes, but does not provide any real data.

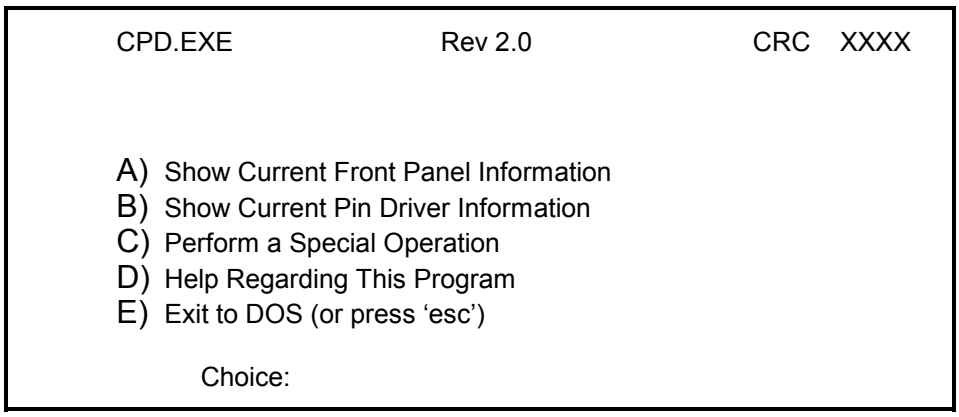
Only the last option listed for /A, /D, and /1,/2,/3,/4 will be accepted.

If the /? option is invoked at any location in the command line, it takes precedence over all other options, and exits to the DOS prompt after displaying the syntax options.

2 - CPD.EXE Revision 2.0 (continued)

It is normal, when starting the program, to see an error that reads, "*OOPS no CRC value today XXXX. Press a key.*" The Xs represent any hexidecimal number. As the message advises, press any key to continue. The main screen will appear as like that shown in Illustration 1-4. Note the CRC value (where the Xs are any hexidecimal number) shown in the upper, right corner of the screen. Verify that the Xs are not all zeros. If the Xs are all zeros then press **E** to exit the program and then restart it again. After it restarts, then again, verify that the CRC value is not all zeros. Normally, the program only needs to be restarted once. Failing to restart the program when the CRC value is all zeros will result in erratic program operation.

The main screen is a menu. Choosing an option from this screen invokes other screens or menus. Illustration 2-1 shows the main screen from which all user selections are made. Illustration 2-2 shows a sample front panel screen (choice **A** from the main menu). Information that would normally be shown via the LEDs on the SSM front panel will also be available from this page. Illustration 2-3 shows a sample pin driver screen (choice **B** from the main menu). This displays the status and configuration of the individual TR, dynamic disable, and multi-coil TR bias drivers. Illustration 2-4 shows the menu for special operations (choice **C** from the main menu). It is from this menu that the user can configure the SSM. Certain changes can also be made to the Erbtec RF amplifier, if present, from this menu. Please be aware that the system settings shown from menu **C** are for display purposes only and are not intended to show the default configuration of a system. The configuration is dependant on the system type and may vary from system to system.



MAIN SCREEN OF CPD.EXE
ILLUSTRATION 2-1

2 - CPD.EXE Revision 2.0 (continued)

Note

If you experience problems viewing the "Current Front Panel Information" screen, press the "A" key and hold until screen view stabilizes. If this doesn't help, exit and then restart the program.

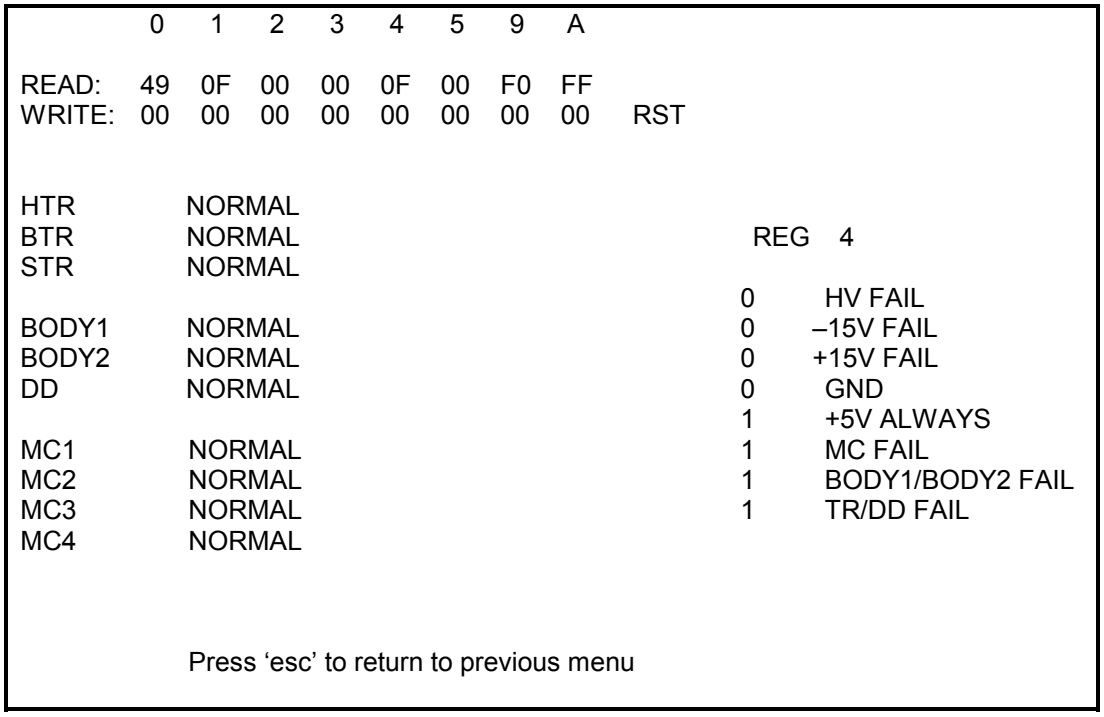
				MON A		MON B
MON A	NORMAL					
MON B	NORMAL	ACCESS LED	ON			
		TEST LED	OFF	OFF	BYPASS	OFF
MC EN	DISABLED	DRV FLT	OFF	OFF	INHIBIT	OFF
TR EN	DISABLED	PS FLT	OFF	OFF	FLT	OFF
DD EN	DISABLED			OFF	SENSE	OFF

DIP SWITCHES	LED BAR 1		LED BAR 2	
0	MDS comm	OFF	Head TR flt	OFF
0	MB comm	OFF	Body TR flt	OFF
0	Mon A comm	OFF	Spec TR flt	OFF
0	Mon B comm	OFF	Body Coil 1	OFF
0	PS fault	OFF	Dyn Dis flt	OFF
0	Top cover	OFF	Body Coil 2	OFF
0	MC disable	ON	MC1 fault	OFF
0	TR disable	ON	MC2 fault	OFF
0	DD disable	ON	MC3 fault	OFF
0	DD open ckt	OFF	MC4 fault	OFF

Press 'esc' to return to main menu

SAMPLE OF CURRENT FRONT PANEL INFORMATION OF CPD.EXE
ILLUSTRATION 2-2

2 - CPD.EXE Revision 2.0 (continued)



SAMPLE PIN DRIVER SCREEN OF CPD.EXE
ILLUSTRATION 2-3

2 - CPD.EXE Revision 2.0 (continued)

```
A) View the EEPROM variables
B) Run Selftest
C) Set DD open circuit tolerance
D) Change RF Amp AFT status
E) Change RF Amp tube serial number
F) Change Multi-coil configuration
G) Change Power Monitor type (1.0T, 1.5T)
H) Change PAC Power Supply Voltage (8V, 9V)
I) Adjust Multi-coil and T/R Circuits
J) Create a test unblank signal
K) Remove test unblank signal
L) Return to Main Menu (or press 'esc')

   Choice:
```

SPECIAL OPERATION MENU OF CPD.EXE
ILLUSTRATION 2-4

Pressing the **<Esc>** key at any screen exits to the previous menu.

Selection **A) View the EEPROM variables** does not work. Selecting this will result in this message displayed on the screen, "Error: can not locate EEPROM.TXT file will be displayed".

Selection **B) Run Selftest** displays the following screen (see Illustration 2-5).

```
Faulting Monitor A ...  Please wait
Asking Amp if it is faulted ...  Please wait

Faulting Monitor B ...  Please wait
Asking Amp if it is faulted ...  Please wait
                                                        FAIL
Checking Amp mode change capability ...  Please wait   FAIL
                                                        PASS
                self test flag = 0003                   PASS
                                                        PASS
Ability of Monitor A to fault the amp:                  PASS
Ability of Monitor A to clear the fault to the amp:     PASS
Ability of Monitor B to fault the amp:
Ability of Monitor B to clear the fault to the amp:
Read of amplifier current mode:
Write of amplifier to different mode:
Write of amplifier to current mode:


                    Press any key to return
```

B) RUN SELFTEST
ILLUSTRATION 2-5

2 - CPD.EXE Revision 2.0 (continued)

Selection **C) Set DD open circuit tolerance** displays the following screen (see Illustration 2-6). These values should normally not be changed.

```
Current Status:
    DAC1 = 009Dh    3.08  V
    DAC2 = 009Dh    3.08  V
    DAC3 = 007Bh    2.41  V
    DAC4 = 0080h    2.51  V
    DAC  Offset = 0054h    1.65  V
    Target comparison = 0001h    0.02  V


Do you wish to update the DAC values 'Y' or 'N'
```

C) SET DD OPEN CIRCUIT TOLERANCE
ILLUSTRATION 2-6

Selection **D) Change RF Amp AFT Status** displays the following screen (see Illustration 2-7). During normal operation this status will show DISABLED for 1.5T Erbtec amplifiers and ENABLED for 1.0T Erbtec amplifiers.

```
Current RF Amplifier AFT status is AFT DISABLED

Do you wish to change it 'Y' or 'N'
```

D) CHANGE RF AMP AFT STATUS
ILLUSTRATION 2-7

Selection **E) Change RF Amp tube serial number** displays the following screen (see Illustration 2-8). When an Erbtec RF amplifier tube is replaced the tube serial number should be changed from this menu to match the number on the new tube.

```
3CPX800A7  Serial Number:
YC156  Serial Number:

Are these correct? (Y)es or (N)o
```

E) CHANGE RF AMP TUBE SERIAL NUMBER
ILLUSTRATION 2-8

Note

Selection **E) Change RF Amp tube serial number** is not applicable to systems without an Erbtec RF amplifier.

2 - CPD.EXE Revision 2.0 (continued)

Selection **F) Change Multi-coil configuration** displays the following screen (see Illustration 2-9). This normally doesn't need to be modified, even on systems that do not have the multi-coil option.

```
Current Multi-coil configuration is :  0F
    Multi-coil   1          ENABLED
    Multi-coil   2          ENABLED
    Multi-coil   3          ENABLED
    Multi-coil   4          ENABLED
Do you wish to change any of them?  y or n

Enter the numbers of the Multi-coils you wish to change state separated by spaces
(i.e.  1  3 will change Multi-coils 1 and 3)
Enter 0 to leave the Multi-coils as they are
```

F) CHANGE MULTI-COIL CONFIGURATION
ILLUSTRATION 2-9

Selection **G) Change Power Monitor type (0.5T, 0.7T, 1.0T, 1.5T)** displays the following screen (see Illustration 2-10). Use this menu to change the power monitor type. This must be done whenever the CPD board or the entire SSM is replaced. Failure to do this will result in "power monitor-type mismatch" errors in the system error log.

```
Current Power Monitor Configuration is :  1.0T

Do you wish to change it? <Y> or <N>  y

Choose one of the following configurations:
A)  0.5T
B)  0.7T
C)  1.0T
D)  1.5T
```

G) CHANGE POWER MONITOR TYPE (0.5T, 0.7T, 1.0T, 1.5T)
ILLUSTRATION 2-10

Selection H) Change PAC Power Supply Voltage (8V, 9V) displays the following screen (see Illustration 2-11). Systems without a repeater board on the penetration panel will set the PAC voltage to 8V.

```
Current PAC  8/9  V configuration is :  9V

Do you wish to change it? <Y> or <N>
```

H) CHANGE PAC POWER SUPPLY VOLTAGE (8V, 9V)
ILLUSTRATION 2-11

Note

The laptop software may not work properly. It may not allow you to change the PAC Voltage but can be used to verify current PAC voltage setting. Use the front switches to change the PAC voltage setting and selection H to verify.

2 - CPD.EXE Revision 2.0 (continued)

Selection **I) Adjust Multi-coil and T/R Circuits** displays the following screen (see Illustration 2-12). This is provided as a troubleshooting aid.

```
Disable unblank from getting to the cabinet
Press the 'D' key when you have done so or press 'esc' to exit
```

I) ADJUST MULTI-COIL AND T/R CIRCUITS
ILLUSTRATION 2-12

Selection **J) Create a test unblank signal** displays the following screen (see Illustration 2-13). This is provided as a testing and troubleshooting aid.

```
Current Unblank Time = 1000.00
Current Blank Time = 15000.00

Enter the amount of Unblank time (in uS):  XXXX.XX
Enter the amount of Blank time (in uS):  XXXXX.XX

Attempting to write new values ...  Please wait
New unblank values written.  Press any key to return.
```

J) CREATE A TEST UNBLANK SIGNAL
ILLUSTRATION 2-13

Selection **K) Remove test unblank signal** does not display a screen but, as it implies, it disables the test unblank signal created with selection **J) Create a test unblank signal**.

Selection **L) Return to main menu** returns to the Main menu (see Illustration 2-4).

3 - MONS1.EXE REVISION 2.2

This program is useful for debugging possible power monitor problems. It can be used to determine what the power monitor sees as power out from the RF amplifier or spectroscopy RF amplifier.

This program can be used to check the power monitor faulting capability. See the procedure for *Power Monitor Functional Checks*.

This program also allows you to view the values that are downloaded from Signa, which is useful in situations where it is unclear if Signa is behaving properly. It is possible to download trip values manually for testing purposes as well.

Several command line options can be invoked to make the program more useful as a debugging tool. They are as follows:

SYNTAX: MONS {/? /(D,A) /(1-4) /(R,U,S)}

Where:

/? = syntax help
/D = debug communications on
/A = auxiliary port communications
/(1-4) = laptop serial communications port (COM1-COM4)
/R = disable RF amplifier refresh
/U = establish a minimum pulse width for display on screen
/S = establish a minimum power threshold for display on screen

The default mode is: MONS /A /1 (i.e., typing **MONS <Enter>** invokes the default).

The /R, /U, and /S options are strictly for screen formatting purposes only. In normal operation, these are constantly updated and thus the value zero (0) is intermixed with the real power and can cause confusion. The same is true for RF pulse width. If the RF amplifier refresh is disabled, it is possible to see only the real power during the RF pulse rather than the zero power during the refresh pulse.

The /D option is useful only if there is no cabinet present. It shows what is available via the program. This is useful for training purposes, but does not provide any real data.

It is possible to use any combination of /R, /U, and /S; however, only the last option listed for /A, /D, and /1,/2,/3,/4 will be accepted.

If the /? option is invoked at any location in the command line, it will take precedence over all other options and will exit to the DOS prompt after displaying the syntax options.

Start the MONS1.EXE program as shown in **Section 1-1 Overview**.

3 - MONS1.EXE Revision 2.2 (continued)

Illustration 3-1 shows a sample of what the main screen of the program looks like. The limits and measures may vary depending on the system configuration.

MONS1.EXE Rev 2.2 8/2/2000

	MONITOR A		MONITOR B	
	LIMIT	MEASURE	LIMIT	MEASURE
spec pwr:	2071 W	1 W	2071 W	4 W
head pwr:	687 W	80 W	687 W	80 W
body pwr:	2197 W	6 W	2197 W	15 W
spec pulse width:	11.60 ms	0.00 ms	11.60 ms	0.00 ms
head pulse width:	29.18 ms	0.90 ms	29.18 ms	0.90 ms
body pulse width:	2.71 ms	0.00 ms	2.71 ms	0.00 ms
spec duty cycle:	16.87 %	0.00 %	16.87 %	0.00 %
head duty cycle:	25.21 %	0.00 %	25.21 %	0.00 %
body duty cycle:	25.41 %	0.00 %	25.41 %	0.00 %
spec cable det:		OPEN		OPEN
head cable det:		NORMAL		NORMAL
body cable det:		NORMAL		NORMAL
+15V supply:		15.04 V		15.10 V
–15V supply:		–15.04 V		–15.04 V
operational status:	NORM		NORM	

Press ‘esc’ to exit, ‘C’ to change limits, ‘N’ for next screen, ‘?’ for help

MAIN SCREEN OF MONS1.EXE
ILLUSTRATION 3-1

3 - MONS1.EXE Revision 2.2 (continued)

The program allows the user to change the power trip, RF pulse width, and duty cycle power monitor limits for the head, body, or spectro modes. This option is invoked by pressing the **<C>** key while the main screen is showing. A list of limit options will be displayed as shown in Illustration 3-2. After selecting one of these options the system will prompt the user to select a power monitor to change. See Illustration 3-3. After selecting which power monitor to change, the system will then prompt the user to enter a value (i.e., watts, milliseconds, or percent). See the bottom of Illustration 3-3.

A. Spectro Power Trip Limit
B. Head Power Trip Limit
C. Body Power Trip Limit
D. Spectro RF Pulse Width Limit
E. Head RF Pulse Width Limit
F. Body RF Pulse Width Limit
G. Spectro Duty Cycle Limit
H. Head Duty Cycle Limit
I. Body Duty Cycle Limit
J. Return to Main Menu (or press 'esc')

Choice:

CHANGE LIMIT SCREEN OF MONS1.EXE
ILLUSTRATION 3-2

A. Spectro Power Trip Limit
B. Head Power Trip Limit
C. Body Power Trip Limit
D. Spectro RF Pulse Width Limit
E. Head RF Pulse Width Limit
F. Body RF Pulse Width Limit
G. Spectro Duty Cycle Limit
H. Head Duty Cycle Limit
I. Body Duty Cycle Limit
J. Return to Main Menu (or press 'esc')

Choice: a

Which Power Monitor would you like to write to? (A or B): a

Power is in Watts, RF Pulse is in ms, Duty cycle is in percent
What value (in decimal) do you wish to write?

CHANGE LIMITS SCREEN AFTER MAKING A CHOICE
ILLUSTRATION 3-3

Note

0.5T, 0.7T and 1.0T systems do not support the Spectro option.

3 - MONS1.EXE Revision 2.2 (continued)

Another feature is the second screen, invoked by pressing the **<N>** key while the main screen is showing. See Illustration 3-4. This screen shows status information for each power monitor. It also shows the last fault detected and the value of the fault. Faults are not cleared until a reset of the power monitor occurs. It is possible in this screen to invoke a power monitor test condition by pressing the **<T>** key. See Illustration 3-5. This function is described in the procedure for Power Monitor Functional Checks.

	MONITOR A	MONITOR B
CRC:	A000	A000
Mon Type:	1.0T	1.0T
Status:	8F10	8F10
Unblank is	ENABLED	ENABLED
Faults are	ENABLED	ENABLED
A Fault is	NOT DETECTED	NOT DETECTED
RF Sense	NO RF	NO RF
Safety Shutdown	NOT ACTIVATED	NOT ACTIVATED
Fault:	0000	0000
RF During 'Blank'	NOT DETECTED	NOT DETECTED
+15 V Power Supply	NORMAL	NORMAL
Body Pwr	NORMAL	NORMAL
Head Pwr	NORMAL	NORMAL
Spec Pwr	NORMAL	NORMAL
Duty Cycle Fault	NORMAL	NORMAL
Pulse Width Fault	NORMAL	NORMAL
–15V Power Supply	NORMAL	NORMAL

Press 'esc' to return to main screen, 'T' for test mode screen

POWER MONITOR STATUS ON MONS1.EXE
ILLUSTRATION 3-4

	MONITOR A	MONITOR B
A Fault is	NOT DETECTED	NOT DETECTED

Press 'esc' to return to previous screen, 'C' to Continue after Fault

'T' TEST MODE SCREEN (NO FAULT)

or

	MONITOR A	MONITOR B
A Fault is	DETECTED	DETECTED

Press 'esc' to return to previous screen, 'C' to Continue after Fault

'T' TEST MODE SCREEN (WITH FAULT)
ILLUSTRATION 3-5

Pressing the **<Esc>** key at any time exits to the previous menu.

REVISION HISTORY

REV	DATE	AUTHOR	PRIMARY REASONS FOR CHANGE
0	Aug. 14, 1997 Jan. 28, 1998	Karyl Verdon (Erbtec) KK	Initial Release - checked consistency w/existing files Converted to Word Format
1	June 23, 1998	K. Keshena	Included directions for Windows95.
2	Dec. 28, 1998	K. Keshena	Added Illustrations of the MONS and CPD software screens.
3	Oct 13, 1999	M. Keber	Added correct proprietary heading to document.
4	March 13, 2001	D. Thome	Revised for revision 2.0 CPD.EXE and revision 2.2 MONS1.EXE. Correct various errors.
5	May 4, 2001	D. Thome	Removed Front Panel section and moved to SSM Theory document RC3THC1.DOC. Corrected errors. Changed the title and format of the document.