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Milton Roy



Spectronic 501/601
Spectrophotometer

Milton Roy

Spectronic 501/601

Spectrophotometer

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Generic Test Equipment		Equipment Specific Test Equipment	
	Leakage Current Meter / Safety Analyzer	1	Spectrophotometric Function Test Set Milton Roy Standards #333150 or (Harleco #64666 or equivalent)
	Digital Volt Meter	1	Holmium test cuvette
	Hand Tools	1	335101-10001 SPECTRONIC 501/601 Operator's Manual
	Leakage Current Meter / Safety Analyzer	1	335101-10020 SPECTRONIC 501/601 Service Manual
	Digital Volt Meter	1	Stray Radiant Energy (SRE) filter
	Hand Tools		
	Eye Protection (UV light and shattering glass)		
	Protective gloves (UV light and lint-less)		

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Parts and Supplies Needed

	SUPPLIES		PARTS
	Paper Towel	1	335423 Tungsten-halogen lamp: 6V - 10 Watt (Phillips type 6605)
	General purpose cleaner	1	343424: Deuterium lamp
	Canned Air (Dry)	1	332879: 2.0 ampere Slo-Blo fuse
	Lint-less wipes (Kim-Wipes)		
	Disinfectant (Clean Conscience)		

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Introduction to Equipment

The Milton Roy 501/601 Spectrophotometer is a simple instrument designed for quick and easy absorbency or transmittance measurements at single wavelengths. The 501 has a range of 325 to 999nm, while the 601 includes the UV range, (195-999nm), with the addition of a Deuterium lamp. These units come with a variety of options such as a heated or cooled sample holder, a recorder output, and an RS232 output. The units are designed for single wavelength measurements but a scanning program could be written via the RS232 communications port. All necessary information is given in the operator's manual in section 9. Though the instrument could not be very accurate between wavelengths far apart, it could be effective for short scans.

Operation is very basic. Enter the desired wavelength, zero the blank and read the sample. Results can be printed out to a printer but it needs to accept serial data and at the set parameters of the unit – see sections 7 and 8 of the operator's manual.

Be aware of the precautions listed at the beginning of this procedure and servicing this unit can be very simple.

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Special Precautions

1. The Tungsten-Halogen lamp operates under high pressure. To avoid accidents, protect the lamp from fingerprints, abrasions, and scratches when handling. Wear eye protection when adjusting the lamp interchange mirror, and never operate the lamp with the shield removed.

2. Allow enough time for the shield and lamp to cool. If the spectrophotometer has been operating even for a short time, the shield and lamp will be very hot. Temperatures are high enough to cause contact burns, so allow at least 5 minutes before removing the shield and lamp.

3. **Use a clean lint-free cloth or wear lint-free gloves to handle the new lamp: fingerprints on the lamp detract from its peak performance and shorten the life of the lamp. SHATTERING: The tungsten lamp operates under high pressure. To avoid accidents, protect the lamp from fingerprints, abrasions, and scratches when handling. Wear eye protection when adjusting the lamp interchange mirror, and never operate the lamp with the shield removed.**

4. The deuterium lamp operates at an extremely high voltage, and has dangerous voltages on the terminals even when the lamp is turned off. Be sure to turn off the power and disconnect the power cord before you attempt to replace the lamp.

5. **ULTRAVIOLET:** The short wavelength UV radiation emitted by the deuterium lamp can be harmful to the eyes and skin. Wear eye protection and avoid exposing skin whenever the lamp cover is removed and the lamp is on (for example, when aligning the lamp mirror).

6. **User Settings:** If the unit is running, save that configuration in the unit's non-volatile memory by pressing the following keystrokes: 1,4 <SECOND> <DIAG>. Any changes you make will then be replaced by these saved default values when the unit is powered on next unless you re-enter different values via the keystrokes listed.

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Initial Preparation

Test Parameter Storage:

The SPECTRONIC 501/601 can store the existing set of test parameters as the "default" values in non-volatile memory. Once stored, these values will be present the next time you turn your spectrophotometer on. Any changes made to these parameters during subsequent use of the spectrophotometer will be temporary and replaced with the stored "default" values when power is cycled.

The parameters that are stored are:

_____ Current wavelength ***(wavelength shown at startup).***

_____ LMP SAV – Lamp saver status. ***<SECOND> <LMP SAV>***

_____ LMP CH – Wavelength defining the change from visible to UV. ***<SECOND> <LMP CH>***

_____ Data mode <%T, A or C >: ***(shown at startup - %T, A or C)***

_____ Factor – ± 0.0000 to 9999 ***< SECOND > <FACTOR>***

_____ SIG AV – Noise reduction factor. ***<SECOND> <SIG AV>***

_____ HI LIM – The highest acceptable final result ***<SECOND> <HI LIM>***

_____ LO LIM – The lowest acceptable final result ***<SECOND> <LO LIM>***

RS-232 interface parameters: ***<1> <1> <SECOND> <DIAG>***

_____ Baud rate – 110, 150, 300, 600, 1200, 2400, 4800 or 9600

_____ Parity – even, odd or none

_____ Number of stop bits – 1 or 2

_____ Terminator characters – CRLF, LFCR, CR, LF

_____ Echo – on or off

_____ Format - computer or printer

_____ Ctrl/s/q – on or off

_____ Answer Back – on or off

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BASIC SPECTROPHOTOMETRIC MEASUREMENTS

To use the SPECTRONIC 501/601 for basic spectrophotometric measurements (absorbency, transmittance, or concentration):

1. Turn Power on.
2. Await completion of SELF-TEST.
3. Enter analytical wavelength.
4. Press <SECOND FUNCTION> < GO TO λ >.
5. Allow 30-minute lamp warm-up.
6. Press < T%/A/C> to choose desired data mode.
7. Open sample compartment door, insert blank into sample holder.
8. Close sample compartment door.
9. Press < SECOND FUNCTION > <100% T/ZERO A >.
10. Open sample compartment door and remove the blank.
11. Insert sample into sample holder and close sample compartment door.
12. Read data that is displayed, or press < SEND > if a printer or computer is installed.

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The following includes all levels of testing. The steps applicable to each level is as follows:

A (abbreviated): Step 1

QA (quality assurance - operational verification): Steps 1, . . .

PM (preventative maintenance): All steps

1. **Historical:** ***optional but beneficial in some cases***

1.1. CHECK THE CURRENT EQUIPMENT LOG SHEET FOR:
  1.1.1. General trends
  1.1.2. Previous Problems and work performed on previous PMS.
1.2. RUN AN EQUIPMENT HISTORY FOR THIS SPECIFIC PIECE OF EQUIPMENT
  1.2.1. Check for reoccurring problems.
  1.2.2. Check for excessive repairs
  1.2.3. Check for unresolved or intermittent problems.
1.3. RUN EQUIPMENT ERROR RECORDS (IF APPLICABLE).
1.4. CHECK ANY SERVICE REPORTS THAT THE CUSTOMER MIGHT HAVE FROM THE MANUFACTURER OR OTHER SERVICE VENDORS.

2. **PRELIMINARY: This does not apply to two-wire and double-insulated equipment.**

2.1. LEAKAGE CURRENT:
  2.1.1. Chassis to Earth Ground (power-cord ground wire intact).
  2.1.2. Chassis to Earth Ground (Open ground wire):
  2.1.3. Ground Wire Resistance:
2.2. CLEAN EXTERIOR AND INTERIOR ACCESSORIES
2.3. VISUALLY INSPECT THE UNIT
  2.3.1. all cords and cables
  2.3.2. verify the viability of the strain relief,
  2.3.3. Knobs and buttons condition.

3. **Post** notification of intent to Pm the unit. Give an appropriate length of time prior to servicing, if applicable.

4. **Contact customer** to notify him of your arrival and post in the instrument's usage log, if applicable.

5. **Store changed settings** Enter the following keystrokes: 1,4 <SECOND FUNCTION> <DIAG>. The new settings will now be the default settings.

6. **Clean** exterior and interior accessories
6.1. Do Not Sterilize. May be cleaned by wiping with a dry cloth.

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Preventative Maintenance

(Continued)

7. LEAKAGE CURRENT:

7.1. Chassis to Earth Ground (power-cord ground wire intact).
7.2. Chassis to Earth Ground (Open ground wire):
7.3. Ground Wire Resistance:

8. Turn on and verify that it goes through the **Self-Test**

9. **NOTE:** For effective operation, the spectrophotometer must **warm up for one-half hour** after being turned on. Allow an additional 15 minutes for stabilization when you turn a lamp on or off.

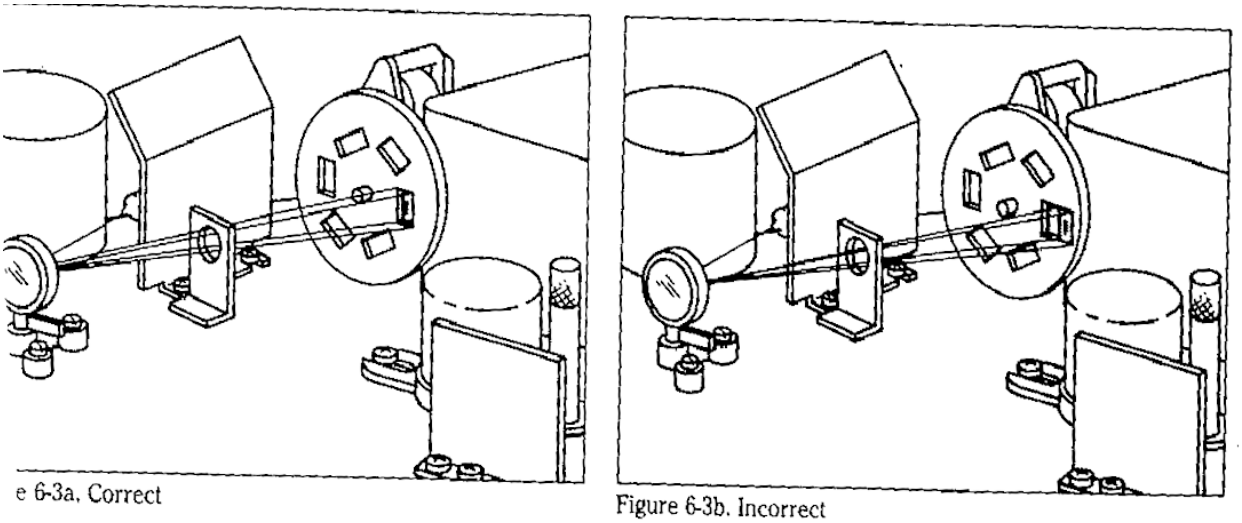
10. **LAMP AND MIRROR ALIGNMENT:** Proper alignment of the lamps and mirror is essential for optimal performance of the spectrophotometer. (Far right Letter on display = lamp in use: T for Tungsten, D = Deuterium and B = both.

11. The alignment itself consists of two parts:
    11.1. Adjusting the position of the light beam hitting and passing through the filters.
    11.2. Minimizing the absorbency reading.

12. The position of the mirror determines the amount of light hitting and passing through the slit. The amount of light in turn directly affects your results and the overall performance of the spectrophotometer. These steps help ensure peak performance of you instrument.

    12.1. If the instrument is off, turn it on and wait for it to initialize. If it is on, turn it off and then on again so that it initializes correctly.
    12.2. **Spectronic 601 only**--Ensure that the wavelength is set to a value greater than 400 nm and press <SECOND FUNCTION> <DEUT> to turn off the deuterium lamp. The lamp indicator on the display should be a "T".
    12.3. Remove the maintenance/lamp access door by loosening the lamp/maintenance compartment access screw three to five complete turns and lifting up the door at the back edge.

    12.4. Examine the illuminated filter on the filter wheel to determine the position of the light. Light should be centered on the filter and on the slit, as shown in Figure 6-3a.



e 6-3a. Correct

Figure 6-3b. Incorrect

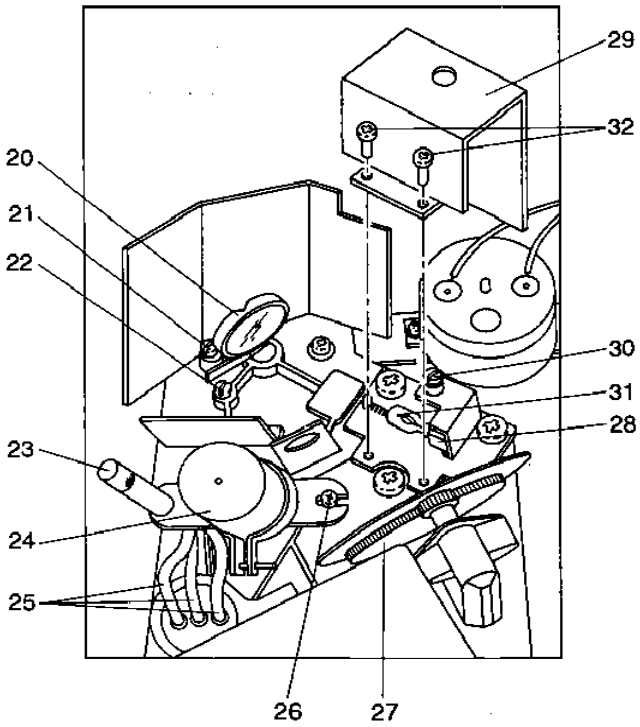
Figure 6-3. Light Hitting and Passing Through

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Preventative Maintenance

(Continued)

12.5. If the light is not passing through the center of the filter as shown in Figure 6-3b, adjust the Tungsten-Halogen lamp adjustment screw (22) and/or the Tungsten-Halogen lamp vertical adjustment screw (30), as indicated in Figure.6.4, until the light is centered on the filter.



13.

14. Figure 6.4

14.1. Press 6, 3, 0, <SECOND FUNCTION>, <GO TO λ > to set the wavelength to 630 nm.

14.2. Use the %T/A/C key to put the instrument into absorbency mode (A).

14.3. Press <1> <%T/A/C > and wait for the instrument to display an absorbency value. (It should be near 1.0).

14.4. Use a flathead screwdriver with an insulated handle to turn the Tungsten-Halogen lamp adjustment screw (22) until the instrument displays a **minimum** absorbency reading. If the instrument displays a negative absorbency reading, stop and repeat step 14.3.

14.5. Use a phillips screwdriver to turn the Tungsten-Halogen lamp vertical adjustment screw (30) until the instrument displays a **minimum** absorbency reading. If the instrument displays a negative absorbency reading, stop and repeat step 14.3 and 14.4

14.6. Turn on Deuterium Lamp: <SECOND FUNCTION>, <DEUT>

14.7. **Spectronic 601 only--**Press 2,4,0, <SECOND FUNCTION>, <GO TO λ > to set the wavelength to 240 nm.

14.8. **Spectronic 601 only--**Use the %T/A/C key to put the instrument into absorbency mode.

14.9. **Spectronic 601 only--**Press <1> <%T/A/C > and wait for the instrument to display an absorbency value. (It should be near 1.0).

14.10. **Spectronic 601 only--**Use a flathead screwdriver with an insulated handle to turn the deuterium lamp adjustment screw (21) until the instrument displays a **minimum** absorbency reading. If the instrument displays a negative absorbency reading, stop and repeat step 14.9 and 14.10

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14.11. When adjustments are complete, turn the instrument off and then on again to re-initialize it.

14.12. Reposition the maintenance/lamp access door and secure it by tightening the lamp/maintenance compartment access screw.

15. **REVISION** (DIAG 2): Press 2 <SECOND> <DIAG> and record the software revision.

16. **DISPLAY TEST** (DIAG 3):

16.1. Checks the spectrophotometer's display by testing all segments. First, sixteen '*'s will appear, then sixteen "0"s. The final display scrolls from left to right, presenting the characters A through Z, and 0 through 9. To stop the test, press any key after the *'s and 0's have been displayed.

17. **656NM DEUTERIUM PEAK FIND** - Spectronic 601 ONLY (DIAG 6):

17.1. This routine turns on the Deuterium lamp, rotates the mirror, and sets the appropriate gain. It also moves the monochromator from 659 to 653nm and displays the measured peak wavelength. Press <CLEAR> to exit. Result should be 656 ± 2nm. Record value on log sheet.

17.2. If out of specification perform the reprogramming of the EEPROM per EEPROM ERROR / MONO ERROR CORRECTION PROCEDURES of August 13, 1997 - see at end of bioengineering's copy of the operation manual.

18. **486NM DEUTERIUM PEAK FIND** – Spectronic 601 ONLY (DIAG 7):

18.1. This routine is similar to diagnostic 6, except that monochromator scans from 489 to 483nm. Press <CLEAR> to exit. Result should be 486 nm (± 2nm). Record value on log sheet.

19. **PEAK NOISE MEASUREMENT** (DIAG 8):

19.1. Measures noise for approximately 15 seconds and displays peak-to-peak noise in absorbency. The value is computed on the displayed data, and applies the <SIG AV> value that is in effect before selecting this diagnostic. The result should be <0.0015 A>

19.1.1. Press: 0, <SECOND> <SIG AV> to set for no filtering.

19.1.2. Press: 8, <SECOND> <DIAG> to run test.

19.1.3. Wait for the "Final PPK" value. Record value on log sheet.

19.1.4. Press <CLEAR> to exit.

19.1.5. Repeat steps 19.1.1 – 19.1.5 for SIG AV filtering values of 1 and 2.

20. **STRAY RADIANT ENERGY (SRE) MEASUREMENT** (DIAG 10): Optional

20.1. Checks SRE by displaying transmittance to within 0.01% resolution. To use this diagnostic, move the spectrophotometer to the appropriate wavelength, set 0A/100%T, and insert the appropriate SRE filter (or Blocking beam assy. if no SRE filter - see NOTE below). Then, enter 10. <SPECIAL FUNCTION> <DIAG>. The SRE measurement will be displayed in the form "SRE=XX.XX T", and will be held for 0.5 seconds (for a longer display, depress and hold down any key as long as you wish to see the display).

NOTE: If SRE filters are not available - use a blocking beam assy. (the holmium filter turned sidewise works well). Set wavelength at 340nm, run and record reading. Reset wavelength to 220nm and run and record again.

Remove the SRE or Blocking-Beam Filter.

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21. **LAMP ALIGNMENT** (DIAG 13): Inappropriately named, as it actually is a gain measurement.
    21.1. Prompts for lamp choice, (601 only), then moves to the appropriate wavelength. Converts display to a linear-responding bar graph. The left-hand digit indicates the relative gain achieved in hexadecimal format with 0 the lowest and F the highest.
        21.1.1. Press: 1,3 <SECOND> <DIAG>.
        21.1.2. Select lamp by pressing <TUNG> or <DEUT>.
        21.1.3. Record gain on log sheet for corresponding lamp.

        21.1.4. Press <CLEAR> to go back to the lamp select prompt or press <CLEAR> again to exit.

22. **KEYBOARD TEST** (DIAG 15):

    22.1. Simply verifies that each key is working. Press the key and observe the display; if keystroke does not produce the character listed in the chart below, contact you authorized Milton Roy service representative. (To exit from this test turn the spectrophotometer off and then on again.)

KEY:	DISPLAYED AS:
<CLEAR >	***C***
<SEND>	***S***
<SECOND FUNCTION>	***N***
<DOWN ARROW>	***D***
<UP ARROW>	***U***
<%T/A/C>	***T***
<+/->	***+***
<.>	***.***
<0-9>	***NUMBER PRESSED***

23. **PRINTER TEST** (DIAG 16): Optional
    23.1. Checks printer operation by transmitting ASCII codes for SPECTRONIC 501/601's character set. Operates continuously until you press <CLEAR> to exit.

24. **Photometric Accuracy:** Use Neutral-Density Filters at 546.1 nm: run 10 times each.

    24.1. 0.3 ABS Filter: record both average and Std Deviation
    24.2. 0.5 ABS Filter: record both average and Std Deviation
    24.3. 1.0 ABS Filter: record both average and Std Deviation

    24.4. Holmium Oxide Filter:
        24.4.1. At 546.1 nm: record both average and Std Deviation
        24.4.2. At 360.8 nm: record both average and Std Deviation

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25. **PHOTOMETRIC LINEARITY TEST**
    25.1. Photometric Linearity: all three of each test tube set is within their respective tolerances. (post readings below).
    25.2. Readings of Test Kit:

Wavelength	Relative Concentration	Actual Absorbance	Absorbance tolerances	Actual %T	%T tolerances
420 nm	1.00		0.824 - 0.602		15.0 - 25.0
	0.75		0.602 - 0.456		25.0 - 35.0
	0.50		0.409 - o.310		39.0 - 49.0
	0.25		0.215 - 0.149		61.0 - 71.0
520 nm	1.00		0.824 - 0.602		15.0 - 25.0
	0.75		0.602 - 0.456		25.0 - 35.0
	0.50		0.409 - o.310		39.0 - 49.0
	0.25		0.215 - 0.149		61.0 - 71.0
670 nm	1.00		0.824 - 0.602		15.0 - 25.0
	0.75		0.602 - 0.456		25.0 - 35.0
	0.50		0.409 - o.310		39.0 - 49.0
	0.25		0.215 - 0.149		61.0 - 71.0

26.

27. **DRIFT TEST:**
    27.1. Empty the sample compartment
    27.2. Enter: 5,0, 0, <SECOND FUNCTION>, <GO TO ^>
    27.3. Make sure it is in ABS mode: <SECOND FUNCTION>, %T/A.C>
    27.4. Record readings: Initial reading and reading after 1 hour.

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Milton Roy - SPECTRONICS 601 - Spectrophotometer
PMQA Check-List

Dept:		**ASSET #:**			Procedure:	L-2910	
Location:		Mfg:	Milton Roy	m/n:	601	s/n	

See the Corresponding PMQA Procedure for details	Dates performed:					Service Manual Section
	Technician's Initials:					
Self Test: (on power-up):						
1. Revision Level: <2>, <SECOND FUNCT>, <DIAG>						
2. Recorder Setup: <4>, <SECOND FUNCT>, <DIAG> after reading press <CLEAR>						
3. 656 nm Deuterium Peak: <6>, <SECOND FUNCT>, <DIAG>, after reading press <CLEAR>						
4. 486nm Deuterium Peak: <7>, <SECOND FUNCT>, <DIAG>, after reading press <CLEAR>						
5. Current wavelength: (wavelength shown at startup)						
6. Lamp status (including <LMP SAV> status. <SECOND FUNC>, <LMP SAV>						
7. Lamp interchange wavelength <SECOND FUNCT> <LMP CH>.						
8. Data mode < %T, A or C>: (shown at startup - %T, A or C):						
9. Factor: <SECOND FUNCT >, <FACTOR>						
10. Signal averaging value: <SECOND FUNCT>, <SIG AV>:						
11. High / Low Limits: <SECOND FUNCT>, <HI LIM> or <SECOND FUNCT>, <LO LIM>:						
12. RS-232 interface parameters: <1>, <1>, <SECOND FUNCT> <DIAG> then step throught each setting by pressing <YES>						
A. Baud Rate:						
B. Parity:						
C. No. of stop bits:						
D. Terminator						
E. Echo						
F. Format:						
G. CTRL / 5 / q:						
H. Answer Back						
13. Relative Tungsten-Halogen lamp intensity (gain). Hexa-decimal format 0-9 and A-F: <1>, <3>, <SECOND FUNCT> <DIAG>						
14. Relative Deuterium lamp intensity (gain). Hexadecimal format 0-9 and A-F: <1>, <3>, <SECOND FUNCTION>, <DIAG>						

REMARKS:

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Milton Roy - SPECTRONICS 601 - Spectrophotometer
PMQA Check-List

Dept:		**ASSET #:**				Procedure:	L-2910
Location:		Mfg:	Milton Roy	m/n:	601	s/n	

See the Corresponding PMQA Procedure for details	Dates performed:					Service Manual Section
	Technician's Initials:					
15. Self Test: (*on power up*) *pass / fail*						
16. Store settings: 1,4, <SECOND FUNCTION>, <DIAG>						
17, Clean: Blow out lamp compartment and clean outside						
18. Lamp & Mirror Adjustment:						
A. VIS: settings… DEUT Lamp = OFF, 630nm, <1> <%T/A/C> adjust screws # 22 and 30						
B. UV: settings… DEUT lamp = ON, 240nm, <1>, <%T/A/C>, adjust screw # 21						
19. DISPLAY TEST: (Diag Test # 3) <3>, <Second Function>, <DIA>						
20. PEAK FIND TEST: (Diag test # 6 and # 7)						
A. 656 nm (± 2.0 nm): <6>, <SECOND FUNCTION>, <DIAG>						
B. 486 nm (± 2.0 nm): <7>, <SECOND FUNCTION>, <DIAG>						
21. PEAK NOISE test: (Diag. Test # 8)						
A. SA = 0 (<0.0015A): <0>, <SECOND FUNCTION>, <SIG AV> <8>, <SECOND FUNCTION>, <DIAG>						
B. SA = 1 (<0.0015A): <1>,, <SECOND FUNCTION>, <SIG AV> <8>, <SECOND FUNCTION>, <DIAG>						
C. SA = 2 (<0.0015A): <2>,, <SECOND FUNCTION>, <SIG AV> <8>, <SECOND FUNCTION>, <DIAG>						
22. STRAY RADIANT ENERGY (SRE): (Diag test # 10)						
A. 340 nm: • 3,4,0, <SECOND FUNCTION>, <YES (Go to λ)> • put into %T mode. . . <%T/A/C> until %T • empty sample chamber, • <SECOND FUNCTION>, <%T/A/C (100%T/ZEROA)>, • insert blocking filter (Holminum - sideway), • 1,0, <SECOND FUNCTION>, <DIAG>						
B. 220 nm: • 2,2,0, <SECOND FUNCTION>, <YES (Go to λ)> • put into %T mode. . . <%T/A/C> until %T • empty sample chamber, • <SECOND FUNCTION>, <%T/A/C (100%T/ZEROA)>, • insert blocking filter (Holminum - sideway), • 1,0, <SECOND FUNCTION>, <DIAG>						
23. LAMP GAIN: (Diag. # 13)						
A. VIS (0 - F) (630nm): 1,3, <SECOND FUNCTION>, <DIAG> Select <9 - TUNG> for lamp.						
B. UV (0 - F) (240nm): <Clear>, select <6 - DEUT> for lamp						

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Milton Roy - SPECTRONICS 601 - Spectrophotometer
PMQA Check-List

Dept:		**ASSET #:**			Procedure:	L-2910	
Location:		Mfg:	Milton Roy	m/n:	601	s/n	

See the Corresponding PMQA Procedure for details	Dates performed:					Service Manual Section
	Technician's Initials:					
24. PHOTOMETRIC ACCURACY: 5,4,6, .,1, <SECOND FUNCTION>, <YES - GO TO λ>						
a. **0.3 abs** Neutral Density Filter @ 546.1 nm: • Empty sample compartment • <SECOND FUNCTION>, <%T/A/C> • Insert 0.3 abs N.D. Filter and Read value: • Remove N.D. Filter. **Average/ Std. Deviation:**						
b. **0.5 abs** Neutral Density Filter @ 546.1 nm: • Empty sample compartment • <SECOND FUNCTION>, <%T/A/C> • Insert 0.5 abs N.D. Filter and Read value: • Remove N.D. Filter. **Average/ Std. Deviation:**						
c. **1.0 abs** Neutral Density Filter @ 546.1 nm: • Empty sample compartment • <SECOND FUNCTION>, <%T/A/C> • Insert 1.0 abs N.D. Filter and Read value: • Remove N.D. Filter. **Average/ Std. Deviation:**						
d. **Holmium Oxide** Filter @ 546.1 nm: • Empty sample compartment • <SECOND FUNCTION>, <%T/A/C> • Insert Holmium Filter and Read value: • Remove Filter. **Average/ Std. Deviation:**						
e. **Holmium Oxide** Filter @ 360.8 nm: • 3, 6, 0, ., 8, <SECOND FUNCTION>, <GO TO λ> • Empty sample compartment • <SECOND FUNCTION>, <%T/A/C> • Insert Holmium Filter and Read value: • Remove Filter. **Average/ Std. Deviation:**						
25. DRIFT TEST: abs, 500 nm • 5, 0, 0, <SECOND FUNCTION>, <GO TO λ> • Empty sample compartment • <SECOND FUNCTION>, <%T/A/C> • Read value: initially and after 1 hour • Remove Filter. **Initial reading & 1-hr reading:**						

REMARKS:

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Milton Roy

Spectronic 501/601

Spectrophotometer

Specifications

Light sources	Tungsten-Halogen (325 to 999nm) Deuterium (195 to 380 nm) (SP 601 only)
Monochromator	Modified Czerny-Turner with holographic grating (1200 lines per millimeter).
Detector	Single silicon photodiode
Wavelength range	501: 325-999nm, 601: 195-999 nm
Wavelength accuracy	± 1.0 nm
Wavelength precision	Better than 0.5 nm
Spectral slit width	<= 5 nm
Stray radiant energy	<= 0.05% T at 220nm and 340 nm
Photometric accuracy	± 0.005 A near 1.0 A
Photometric stability	± 0.003 A per hour near 0 A
Noise	Less than 0.004 A near 2 A nm, Less than 0.0015 A near 0 A
Photometric Ranges	Absorbency: -0.1 to 3.0 A, Transmittance: 0.0 to 125% T, concentration: -9999 to + 9999
Sample compartment dimensions	10.2 cm (4 in) High x 10.6 cm (4.2 in) Wide x 17.1 cm (6.5 in) Deep
Power requirements	100/115 and 220/240 V. ± 10%; 50/60 Hz, ± 2 Hz; 2.0 A
Overall dimensions	19.7 cm H x 44.5 cm W x 49 cm D; (7.75" H x 17.5" W x 14.3"D).
Weight	15 kg (35 lbs.)
Environment Operating	50-105 F; 10-40.5 C. relative humidity 10-60%
Storage	-40 to 105 F; -40 to 40.5 C; relative humidity not to exceed 60% (Allow unit to adjust to room temperature for 24 hours when taking it out of storage.)

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Technician's Notes

1 Thermo Spectronics has bought out Milton Roy.
2 Most parts and manuals are no longer available (1/1/02).

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EEPROM ERROR / MONO ERROR CORRECTIONS PROCEDURES

The following procedure should allow for correction of the EEPROM error that is occurring with the 501/601 Spectrophotometer.

This problem is usually caused by power line anomalies (surges, spikes, or low voltage conditions). A line conditioner may be required if this is a recurring problem.

If the power line is okay, then a problem may exist on the CPU board in the unit. Replacement of the board or the EEPROM may be required. An internal power supply problem could also be a cause.

See FAX from Milton Roy at the end of bioengineering's operator manual.

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Troubleshooting

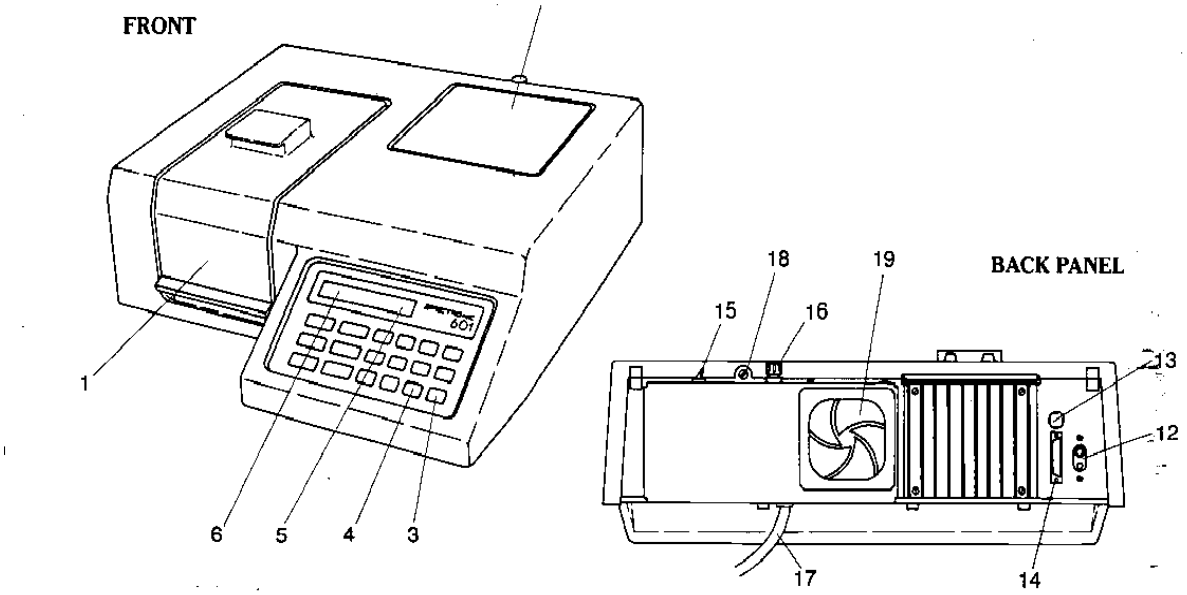
See Section 6.4 MAINTENANCE & TROUBLESHOOTING page 11 in bioengineering's copy of Spectronic 601 Operation Manual.

See Section 6.4.2 ERROR MESSAGES page 12 in bioengineering's copy of Spectronic 501/601 operation manual.

See the August 13, 1997 FAX from Spectronic Instruments, Inc: EEPROM ERROR/ MONO ERROR CORRECTIONS PROCEDURES at the back of bioengineering's Spectronic 601 operation manual.

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Block Diagram



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Manufacturer & Vender Information

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Appendix

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