I. PURPOSE:

The accuracy of the Genesys 20 spectrophotometer is monitored once a year by performing selected diagnostic procedures designed by the manufacturer. SPECTRONIC Standards are used for this. SPECTRONIC Standards enable the spectrophotometer user to quickly and reliably evaluate the major performance parameters the Genesys 20 spectrophotometer. Four tests are performed; Wavelength Accuracy, 0% transmission, Stray Radiant Energy, and Photometric Accuracy.

II. MATERIALS:

SPECTRONIC standards

III. PROCEDURE:

Table 1: Maximum Acceptable deviations from nominal for SPECTRONIC Standards	
Spectrophotometer	20
Stray Radiant Energy	0-0.85%
Wavelength Accuracy	+/- 4.5nm
0 % T	+/-0.2
Photometric Accuracy	+/-1.2%

Wavelength Accuracy:

The wavelength accuracy standard produces three widely spaced, symmetrical, high transmittance peaks in the regions of 400nm, 525nm, and 780 nm. The primary testing peak, near 525 nm, is located in the region where the spectrophotometer shows the flattest energy measurement response with small changes in wavelength. The 400nm and 780nm are used to check the repeatability of the instrument over a wider wavelength range. Only the 525nm standard is traceable to the SPECTRONIC calibration spectrophotometer.

1. Insert the SPECTRONIC wavelength standard
2. Refer to the certificate provided with the set of with the set of SPECTRONIC Standards. Set the wavelength 10nm lower than the certified wavelength found on the certificate.
3. Adjust the 100% T control to give a reading that is on scale, preferably in the 40 to 50% region.

4. Slowly change the wavelength towards the certified wavelength. The % T should increase. If not, go back to step 1 and use a lower wavelength
5. Repeat steps 1-3 with the other two solid-line peaks on the certificate. These two peaks are not certified, but can be used to check repeatability.
6. Record the wavelengths with the highest absorbance in appendix A

0% Transmission and Stray Radiant Energy Test

The 0% transmittance standard is opaque at all spectrophotometric wavelengths. It is used to check the 0% reading by blocking the light beam from the instrument's source lamp. This constitutes a test for light leaks and for incorrect adjustment of the zero setting. The stray radiant energy standards are opaque at their test wavelengths. The wavelengths chosen correspond to points of low energy for tungsten lamps, so tests measure worst-case stray radiant energy

1. Set the wavelength to 400nm
2. Set the readout to 0 % transmission
3. Insert the optical alignment test piece
4. Set the readout to 100 % transmission
5. Replace the optical alignment test piece with the 0 % transmission standard
6. Record the 0 % transmission reading in appendix A
7. Replace the 0 % transmission standard with the SRE standard whose wavelength corresponds with step 1
8. Observe the % transmission reading
9. Subtract the reading in step 7 from step 8
10. Record stray radiant energy in appendix A
11. Repeat steps 1-8 at 340 nm using the corresponding stray radiant energy standard
12. Record stray radiant energy in appendix A

Photometric Accuracy

The photometric performance standards test photometric accuracy, linearity, and precision. Transmittance of these standards is extremely constant with changes in wavelength in the region of 590nm. This allows photometric errors to be distinguished from wavelength errors.

1. Set the wavelength to 590nm
2. Set 0% T with the sample compartment empty
3. Insert optical alignment test piece

4. Adjust the instrument to 100% T
5. Replace the optical alignment piece with the standard whose labeled value is near 50%
6. Record the reading in appendix A
7. Replace the 50% standard and replace with the one whose labeled value is near 10%.
8. Record the reading in appendix A

IV. REFERENCES

SPECTRONIC Standards operating manual. Rev. 01/98

V. HISTORY:

H-1 This procedure was written by Andrew Link 06/21/2013

SPECTRONIC Standards Test Log

H-07-021 Appendix A

Date	0% T	Stray Radiant Energy		Wavelength Accuracy			Photometric Performance		
		340 nm	400 nm	___ nm peak	___ nm peak	___ nm peak	10 % T	50 % T	Comments