

**SpectroQuest™**

**UV/Visible Spectrophotometers**



**UNICO®**

## SpectroQuest™

Unico is proud to introduce the all new complete SpectroQuest line of UV-Visible spectrophotometers. The new SpectroQuest line consists of four distinct series to meet the broad requirements of education, industrial and research applications:

UV-2800 Series Single Beam 4nm UV/Vis spectrophotometer

UV-2802 Series Single Beam 1.8nm or variable slits UV/Vis spectrophotometer

UV-3802 Series Split Beam 1.8nm UV/Vis spectrophotometer

UV-4802 Series Double Beam 1.8nm UV/Vis spectrophotometer

All SpectroQuest spectrophotometers features high performance sealed optics mounted on a stable machined platform. The innovative optical layout and state of art monochromator with high grade blazed holographic grating ensure accuracy. Its integrated design assures long term stability and durability. The precisely aligned detector and quality deuterium and halogen lamps enhance the precision across the UV/Vis spectrum starting from 190nm and into the near-infrared (NIR) 1100nm. The comprehensive features, sophisticated powerful software, variety of accessories and model configurations will meet or exceed your expectations for performance and value.



### Features at a Glance:

- Choice of single beam, split beam or double beam designs
- Fixed or variable slits (bandwidths)
- PC models or Stand-alone models with large LCD display
- Non-volatile memory storage and one-button easy recall
- Sealed and solvent-resistant tactile keypad with alpha-numeric entry for user file names and user entry of units
- Pre-aligned deuterium lamp for easy lamp replacement. Lamp usage and the status of the lamps may be monitored
- Powerful built-in or PC Windows® software including sophisticated utility programs
- Data Download-to-PC software for stand-alone models (optional)
- Online software upgrade capability via Internet (for stand-alone models)
- Full A4 print-outs of graphs and tables of results with popular inexpensive printers such as HP or Epson Deskjet
- Real-time clock for date and time stamping of results
- Performance validation and report (GLP compliance)
- Full CE compliance

## SpectroQuest: The Comprehensive Spectrophotometer

### UV-2800 Single Beam UV/Vis Spectrophotometer

UV-2800 is the most economic general-purpose design in the SpectroQuest line. It is a stand-alone model with 4nm fixed bandwidth and has all the features that SpectroQuest line offers for a stand-alone unit. It provides excellent performance for measurements in the range of 190nm to 1100nm. It has a large angled LCD screen with contrast adjustment for comfort viewing. The large sample compartment accommodates a wide range of cell holders and accessories including peristaltic sipper and peltier system. Optional PC download software and PC Windows® application software make this instrument very versatile.



UV-2800

### UV-2802 Series Single Beam UV/Vis Spectrophotometers

UV-2802 series is an advanced single beam design consisting of four models: Stand-alone model UV-2802 with 1.8nm fixed bandpass and model UV-2802S with variable slits (0.5nm, 1nm, 2nm and 4nm); PC model UV-2802PC with 1.8nm fixed bandpass and PC model UV-2802PCS with variable slits (0.5nm, 1nm, 2nm and 4nm). UV-2802 has all the features that SpectroQuest line offers in a stand-alone unit. The PC models come standard with Windows® based application software (PC not included).

All instruments provide excellent performance for measurements.

The large sample compartment accommodates a wide range of cell holders and accessories including peristaltic sipper and peltier system.



UV-2802

### UV-3802 Split Beam UV/Vis Spectrophotometer

UV-3802 is a split beam design. It is a stand-alone model with 1.8 nm fixed bandwidth and has all the features that SpectroQuest line offers in a stand-alone unit. The second detector is simultaneously monitoring the system stability to optimize measurement accuracy. It provides excellent performance for measurements in the range of 190nm to 1100nm. It has a large angled LCD screen with viewing contrast adjustment. The large sample compartment accommodates a wide range of cell holders and accessories including peristaltic sipper and peltier system. Optional PC download software and PC Windows® application software make this a versatile instrument.



UV-3802

### UV-4802 Double Beam UV/Vis Spectrophotometers

UV-4802 is a double beam design. It is a stand-alone model with 1.8 nm fixed bandwidth and has all the features that SpectroQuest line offers in a stand-alone unit. The two detectors are measuring sample and reference respectively and simultaneously for optimizing measurement accuracy. It provides excellent performance for measurements in the range of 190nm to 1100nm. It is suitable for pharmaceutical, biochemical and clinical lab applications as well as routine applications such as quantitative analyses, kinetics, spectrum scanning, multiple components and DNA/Protein. Optional PC download software and PC Windows® application software make this instrument versatile.



UV-4802

## Easy to Operate Local Control Software (Stand-alone Version)



All software methods are included as built-in standard, thus eliminating the need for software options.

Online software upgrade via Internet helps to keep your software up-to-date.

Data Download-to-PC software expands the data storage to unlimited.

### 1. Basic Mode

Absorbance, %T or Concentration measurements.

### 2. Quantitative

Establish or use stored calibration equation to measure the concentration of unknowns.

### 3. WL scan

Spectrum scan of sample at any selected wavelength range with choice of scanning speed and wavelength interval.

### 4. Kinetics

Measurement of absorbance changing vs. time with reaction rate calculation function.



### 5. DNA/Protein

Calculation of concentration and DNA purity. Ratio at other wavelengths can be measured.

### 6. Multi Wavelength

Measurement at multiple wavelengths to analyze and determine the composition of the mixtures.

### 7. Utility - GLP

Utility programs offer wavelength and photometric accuracy validation for GLP compliance. It contains useful programs and tools such as re-set dark current, re-set lamp change-over wavelength, lamp usage set, set clock, etc.

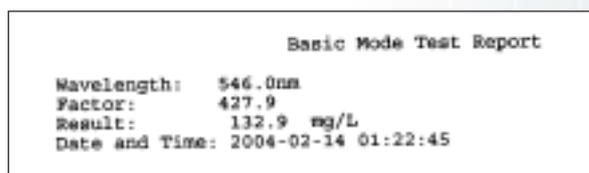
### 8. Defined Test

This is an open platform for user defined programs.

## Powerful Integrated Software for Data Acquisition (stand-alone)

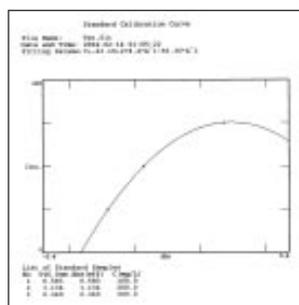
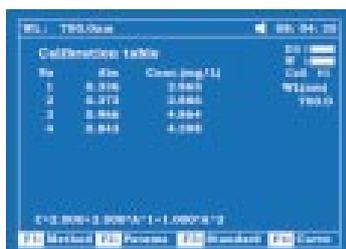
### Basic Photometric Mode

Measures Absorbance, %T and Concentration with entry of Concentration Factor or the Concentration of the standard. Units such as ug/mL, mg/mL, mg/L, g/L, ppb, ppm, %, I.U., mM/L, M/L may be selected or other units may be entered via the keypad. Continuous display of the result means there is no need to press a button to read.



### Quantitative

Up to 10 standard solutions may be used to establish calibration equation curve. There is a choice of four methods for fitting a curve through the calibration points: Linear fit. Linear fit through zero, square fit and cubic fit.



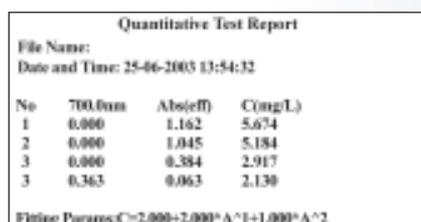
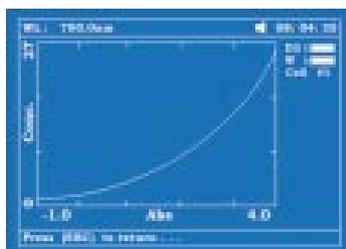
There are three kinds of correction method:

1. Single wavelength method
2. Iso-absorbance (two wavelength method):

The absorbance at the measurement (peak) wavelength is measured relative to the absorbance at a second (valley) wavelength. This minimizes the effects of cell difference and turbidity

3. Three-point:

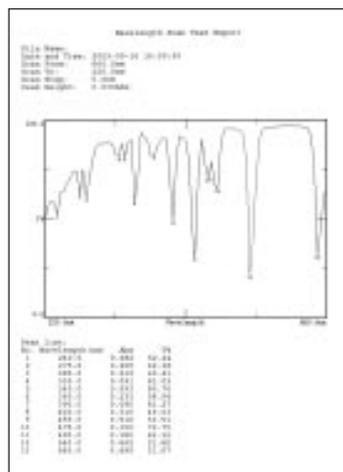
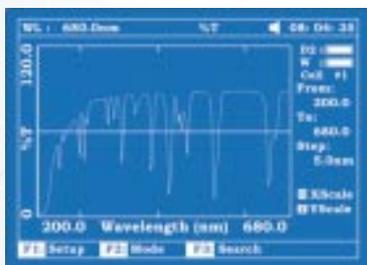
The absorbance of the peak itself is measured by subtracting the calculated tangent joining the valleys on each side of the peak.



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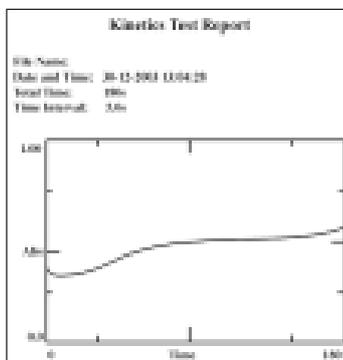
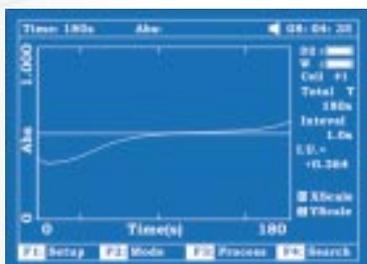
## Wavelength Scanning

The wavelength scan intervals are 0.1, 0.2, 0.5, 1, 2, 5nm, and Hi, Medium and Low scan speeds are available. Scan speeds vary from 100 to 1000 nm/min. Wavelengths are scanned from high to low so that the instrument waits at high wavelength. This minimizes the degradation of UV sensitive samples. Precise control of filter and lamp changes means that their effects are not seen on the final scan. Post-run manipulation includes re-scaling axes, curve tracking and peak picking.



## Kinetics

This mode may be used for time course scanning or reaction rate calculations. Abs. vs. time graphs are displayed on the screen in real time. Wait time and measurement time up to 12 hours may be entered with time intervals of 0.5, 1, 2, 5, 10, 30 secs and 1 min. Post-run manipulation includes re-scaling, curve tracking and selection of the part of the curve required for the rate calculation. Rate is calculated using a linear regression algorithm before multiplying by the entered factor.



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## DNA/Protein

Concentration and DNA purity are calculated:

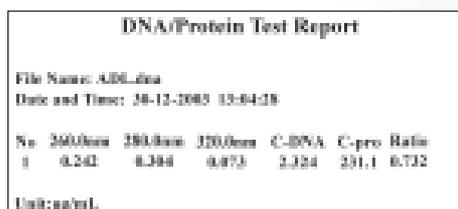
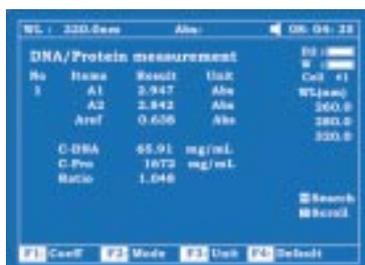
Absorbance ratios 260nm/280nm or 260nm/230nm

With optional subtracted absorbance at 320nm

DNA Concentration =  $62.9 \times A_{260} - 36.0 \times A_{280}$  or  $49.1 \times A_{260} - 3.48 \times A_{230}$

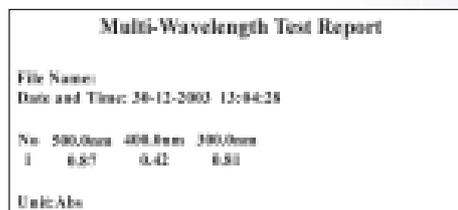
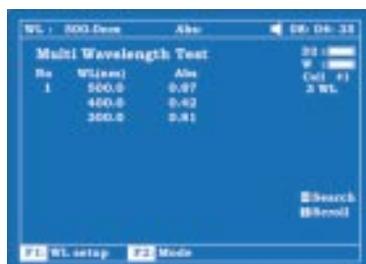
Protein Concentration =  $1552 \times A_{260} - 757.3 \times A_{280}$  or  $183 \times A_{260} - 75.8 \times A_{230}$

Other wavelengths and factors may be entered.



## Multi-Wavelength

Up to 10 wavelengths may be entered, allowing the measurement of multiple wavelengths on a series of samples.



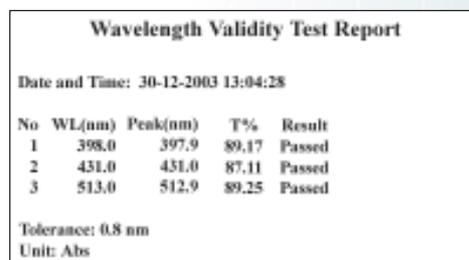
## Performance Validation

for the GLP compliant laboratory

SpectroQuest spectrophotometers may be automatically self-calibrated on switch-on, using the 656.1nm deuterium emission line. This function may be repeated at any time.

The wavelength accuracy may be checked using the "WL Validity" program (wavelength calibration standards required).

The absorbance accuracy at several wavelengths may be checked using the "Accu Validity" program.



## Data Download Software (Cat No. 2800-405)

The data download software is designed to download data stored in the spectrophotometer memory to a PC in text file format for easy exporting into a spreadsheet.

## Powerful Windows®- Based Application Software (PC Version)

The SpectroQuest Windows®-based PC application software takes the best features of the stand-alone version plus more powerful data processing and expanded data collecting and storage capability. It comes standard with SpectroQuest PC models and is optional to stand-alone models.

It can import the saved data from the standalone spectrophotometer and do post-run processing.



### The PC application software offers:

1. Abs/%T/Conc Test
2. Quantitative (standard curve)
3. Kinetics
4. Multi-wavelength Test
5. Wavelength Scanning
6. DNA/Protein

### Multi-Wavelength

Up to 32 wavelengths can be selected and multiple samples can be measured. (Auto cell changer is required to run multiple samples automatically).



### Quantitative (Standard Curve)

Use up to 32 standards to establish standard curve.

Four methods for fitting a curve:

1. Linear fit
2. Linear through zero
3. Square fit
4. Segmented



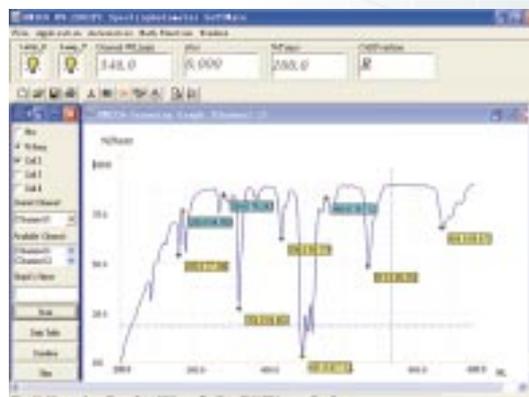
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## Wavelength Scanning

Automatically record peaks and valleys. Eight channels can simultaneously store up to 8 curves.

Post-run manipulation and processing includes:

1. Re-scaling axes, curve
2. Smoothing, combination, zooming, overlap...
3. 1<sup>st</sup> to 4<sup>th</sup> derivative

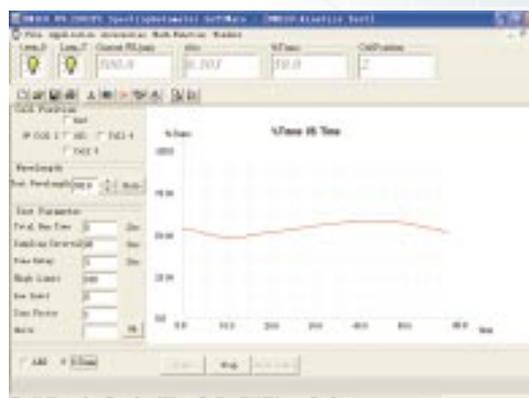


## Kinetics (Abs vs. Time)

The Kinetics mode may be used for time course scanning or reaction rate calculations. Abs. vs. time graphs is displayed on the screen in real time.

Wait time, measurement time and time intervals may be entered.

Post-run manipulation includes re-scaling, curve tracking and selection of the part of the curve required for the rate calculation. Rate is calculated using a linear regression algorithm before multiplying by the entered factor.



## DNA/Protein

Concentration and DNA purity are Quickly and easily calculated: Absorbance ratios 260nm/280nm with optional subtracted absorbance at 320nm.

DNA Concentration =  $62.9 \times A_{260} - 36.0 \times A_{280}$

Protein Concentration =  $1552 \times A_{260} - 757.3 \times A_{280}$

Other wavelengths and factors may be entered.

The screenshot shows the SpectroQuest software interface with a table of calculated DNA and protein concentrations. The table has columns for Wavelength, A260, A280, A320, DNA, and Protein. The data is as follows:

Wavelength	A260	A280	A320	DNA	Protein
260	0.000	0.000	0.000	0.000	0.000
265	0.000	0.000	0.000	0.000	0.000
270	0.000	0.000	0.000	0.000	0.000
275	0.000	0.000	0.000	0.000	0.000
280	0.000	0.000	0.000	0.000	0.000
285	0.000	0.000	0.000	0.000	0.000
290	0.000	0.000	0.000	0.000	0.000
295	0.000	0.000	0.000	0.000	0.000
300	0.000	0.000	0.000	0.000	0.000
305	0.000	0.000	0.000	0.000	0.000
310	0.000	0.000	0.000	0.000	0.000
315	0.000	0.000	0.000	0.000	0.000
320	0.000	0.000	0.000	0.000	0.000
325	0.000	0.000	0.000	0.000	0.000
330	0.000	0.000	0.000	0.000	0.000
335	0.000	0.000	0.000	0.000	0.000
340	0.000	0.000	0.000	0.000	0.000
345	0.000	0.000	0.000	0.000	0.000
350	0.000	0.000	0.000	0.000	0.000
355	0.000	0.000	0.000	0.000	0.000
360	0.000	0.000	0.000	0.000	0.000
365	0.000	0.000	0.000	0.000	0.000
370	0.000	0.000	0.000	0.000	0.000
375	0.000	0.000	0.000	0.000	0.000
380	0.000	0.000	0.000	0.000	0.000
385	0.000	0.000	0.000	0.000	0.000
390	0.000	0.000	0.000	0.000	0.000
395	0.000	0.000	0.000	0.000	0.000
400	0.000	0.000	0.000	0.000	0.000

## Optional SpectroQuest™ Accessories

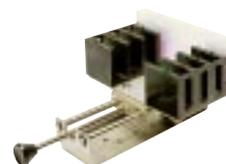
### Test Tube Holder (Cat No. UV-2800-101P)

Test tube holder kit for 8-20mm diameter test tubes. Includes universal base, V-type tube holder. The maximum tube height is 100 mm.



### 4-Cell 100mm Long Path Cell Holder (Cat No. UV-2800-102P)

Rectangular long path cell holder kit for 4 cells up to 100mm pathlength.



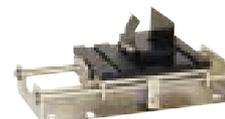
### 4-Cell 50mm Long Path Cell Holder (Cat No. UV-2800-102-50)

Rectangular long path cell holder for 4 cells up to 50mm pathlength.



### Cylindrical Cell Holder (Cat No. UV-2800-104P)

Cylindrical cell holder kit for single cell up to 100mm pathlength (20mm dia.). Includes universal base and one holder.



### Water-Jacketed Cell Holder (Cat No. UV-2800-105P)

Water-Jacketed single cell holder kit including universal base and one water-jacketed cell holder. It maintains desired temperature by circulating constant-temperature water from water bath (water bath required and not included).



### Micro Cell Holder (Cat No. UV-2800-106P)

Measure a sample with volume of 100uL using micro cell holder. The x-y adjustable mechanism is used to align cell with optical beam for optimized results.



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## Peltier Unit (Cat. No. UV-2800-107P)

Peltier unit for continuous temperature control from 15 to 40° C. The x-y adjustable mechanism is used to align cell with optical beam for micro cell setup. The temperature display resolution is 0.1°C. The unit consists of a controller a thermoelectrically controlled cell holder.



## Ambient Sipper Unit (Cat. No. UV-2800-108P)

Sipper system for single cell flow thru. The x-y adjustable mechanism is used to align cell with optical beam for micro flow cell setup. The sipper unit consists of a flow-thru controller with peristaltic pump and flow-thru front panel (flow cell and tubing not included).

Note: Requires flow cell and proper tubing to complete flow thru setup.



## Peltier/Sipper System (Cat. No. UV-2800-109P)

Peltier/Sipper system for single cell flow thru and continuous temperature control from 15 to 40° C. The x-y adjustable mechanism is used to align cell with optical beam for micro flow cell setup. The temperature display resolution is 0.1°C. The unit consists of a Peltier/Sipper controller with peristaltic pump and a thermoelectrically temperature controlled cell holder with panel. The unit can be used as flow thru only or temperature control only.

Note: Requires flow cell and proper tubing to complete flow thru setup.



## 8-position Auto Cell Changer (Cat No. UV-2800-121)

Eight-position automatic cell changer designed for UV-2800/2802/3802 series spectrophotometers.



## 6-position Auto Cell Changer (Cat. No. UV-4802-120)

Six-position automatic rotating cell changer designed for UV-4802 series spectrophotometer.



## Reflectance Measurement Attachment (5° incident angle) (Cat No. UV-2800-122)

The technique of reflectance measurement is used for evaluation of materials relative to a reflectance surface. The minimum sample is (L) 30 x (W) 30 mm.



## Cuvettes

A large variety of cuvettes available including standard square glass cells, quartz cells, long path cells, semi-micro and micro cells, short path cells, cylindrical cells and flow thru cells.



## SpectroQuest Spectrophotometer Specifications

Model	UV-2800	UV-2802/2802S	UV-2802PC/2802PCS	UV-3802	UV-4802
Wavelength Range	190-1100nm				
Spectral Bandwidth (slits)	4nm	1.8nm (UV-2802) 0.5, 1, 2, 4nm (UV-2802S)	1.8nm (UV-2802PC) 0.5, 1, 2, 4nm (UV-2802PCS)	1.8nm	
Optical System	Single Beam, Grating 1200 lines/mm			Split Beam, Grating 1200 lines/mm	Double Beam, Grating 1200 lines/mm
Wavelength Accuracy	±0.8nm	±0.3nm			
Wavelength Resolution	±0.1nm				
Wavelength Repeatability	±0.5nm	±0.2nm			
Photometric Range	0-200%T, -0.3-3A, 0-9999Conc.				
Photometric Accuracy	±0.5%T	±0.3%T			
Photometric Repeatability	Better than 0.3%T	Better than 0.2%T			
Stray Light	<0.15%T	<0.10%T	<0.10%T	<0.10%T	<0.10%T
Baseline Flatness	±0.004A	±0.002A	±0.002A	±0.002A	±0.002A
Stability	0.002A/h @500nm	0.002A/h @500nm	0.002A/h @500nm	0.001A/h @500nm	0.001A/h @500nm
Scanning Speed	Hi, Med., Low. Max. 1000nm/min		600nm/min	Hi, Med., Low. Max. 1000nm/min	
Light Source	Halogen, Deuterium (pre-aligned)				
Display	Graphic LCD (320x240) dots		No LCD	Graphic LCD (320x240) dots	
Keyboard Control	29 Membrane keypad		No Buttons	29 Membrane keypad	
Output	RS-232C port Parallel Port (printer)				
Sample Compartment	Accommodates 100mm pathlength cuvette with optional holder				
Printer	HP, Epson Selected models		Epson Selected models	HP, Epson Selected models	
Power Requiremen	220V-240V/50Hz, 110V-120V/60Hz Switchable				
Dimensions (W x D x H)	550 x 420 x 270mm	620 x 400 x 280mm			
Weight	20kg / 44 lbs	22kg / 48 lbs	24kg / 53 lbs	23kg / 50 lbs	24kg / 53 lbs
Shipping Dimensions	650 x 540 x 390mm / 720 x 525 x 370mm				
Shipping Weight	24kg/53 lbs	26kg / 57 lbs	28kg / 62 lbs	27kg / 59 lbs	28kg / 62 lbs



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