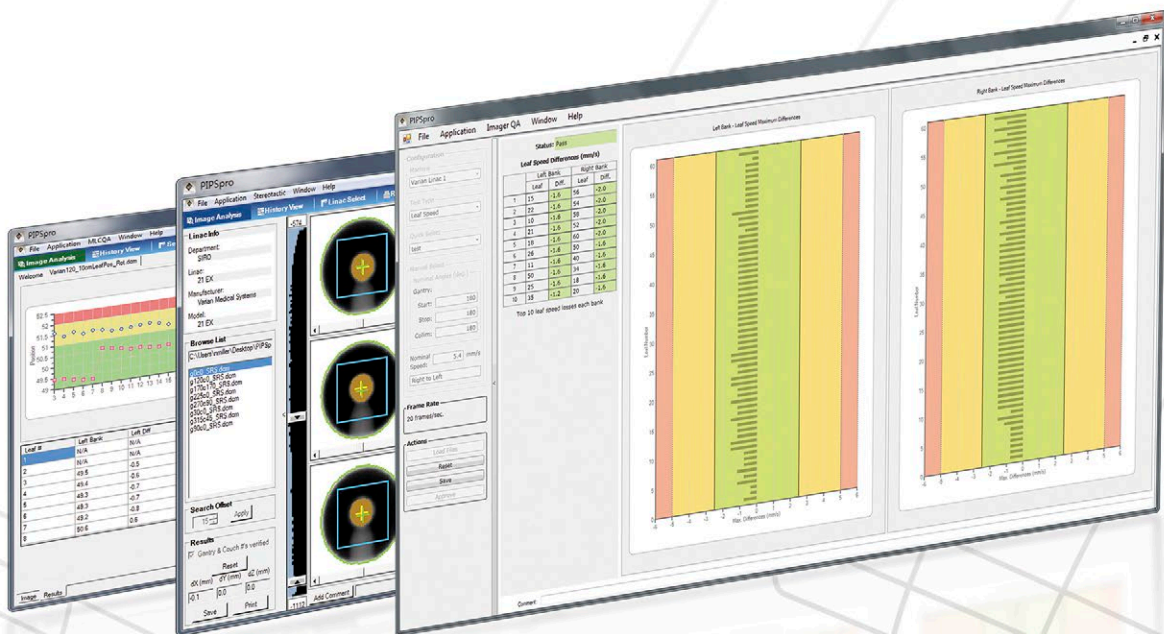


# MONTHLY QA

AUTOMATED ANALYSIS OF QA TASKS



PIPSPRO™ SOFTWARE

PIPSPRO™ SOFTWARE

OVER 30 PROCEDURES IN ONE EASY-TO-USE PLATFORM

TABLE II – MONTHLY MECHANICAL

- Light/radiation field coincidence
- Jaw position indicators
- Cross-hair centering

TABLE III – ANNUAL MECHANICAL

- Collimator rotation isocenter
- Gantry rotation isocenter
- Couch rotation isocenter
- Coincidence of radiation and mechanical isocenter

TABLE V – MULTILEAF COLLIMATION WEEKLY

- Qualitative test, aka “picket fence”

MONTHLY

- Setting vs radiation field for two patterns
- Travel speed
- Leaf position accuracy

ANNUAL

- MLC transmission
- Leaf position repeatability
- MLC spoke shot
- Coincidence of light field and x-ray field
- Segmental IMRT
- Moving window IMRT

TABLE VI – IMAGING DAILY

- PLANAR KV AND MV (EPID) IMAGING
  - Positioning/repositioning
  - Imaging and treatment coordinate coincidence
- CONE-BEAM CT (KV AND MV)
  - Imaging and treatment coordinate coincidence
  - Positioning/repositioning

MONTHLY

- PLANAR MV IMAGING (EPID)
  - Imaging and treatment coordinate coincidence
  - Scaling
  - Spatial resolution
  - Contrast
  - Uniformity and noise
- PLANAR KV IMAGING
  - Imaging and treatment coordinate coincidence
  - Scaling
  - Spatial resolution
  - Contrast
  - Uniformity and noise
- CONE-BEAM CT (KV AND MV)
  - Geometric distortion
  - Spatial resolution
  - Contrast
  - HU constancy
  - Uniformity and noise



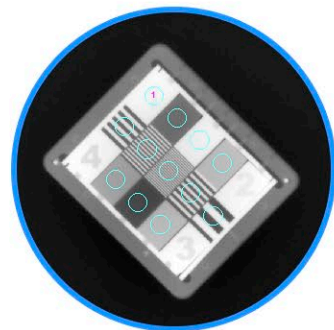
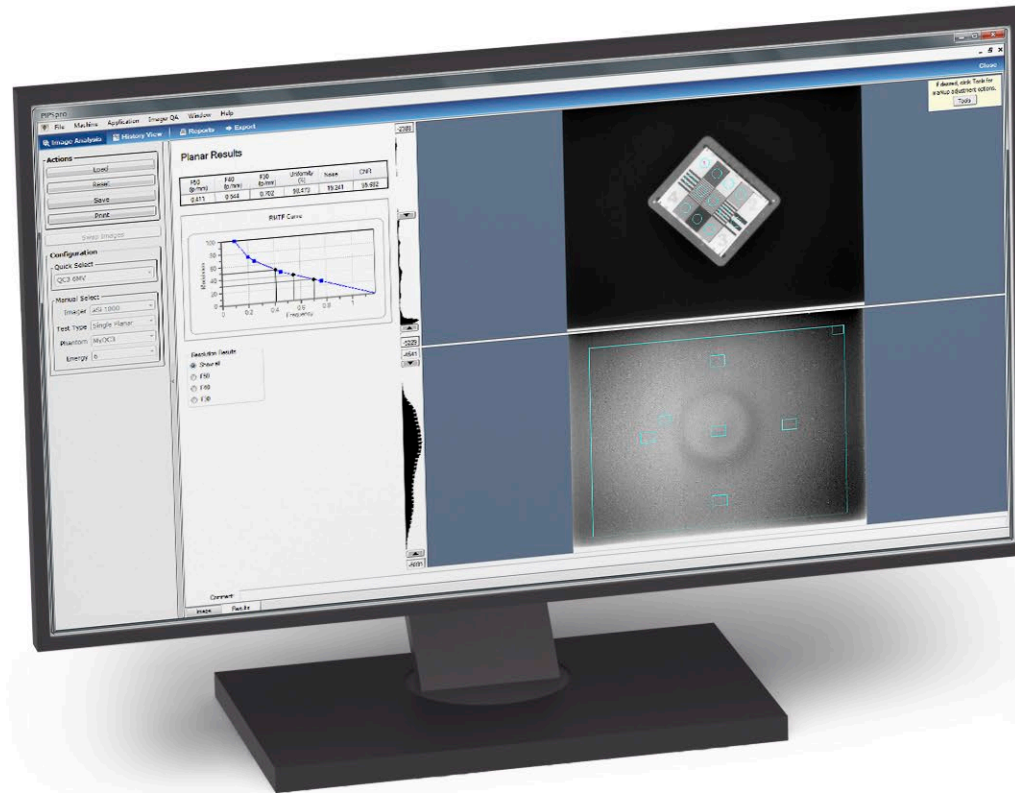
RICK BAKER  
PHYSICS APPLICATIONS SPECIALIST  
IOWA HEALTH DES MOINES  
JOHN STODDARD CANCER CENTER

“PIPSpro software and phantoms are valuable tools for streamlining over 30 of the TG-142 tests, automating data analysis, and providing documentation of the test results. By providing quantifiable and repeatable results, PIPSpro makes it easier for our center to become compliant with TG-142.”

## TG-142 MADE EASY

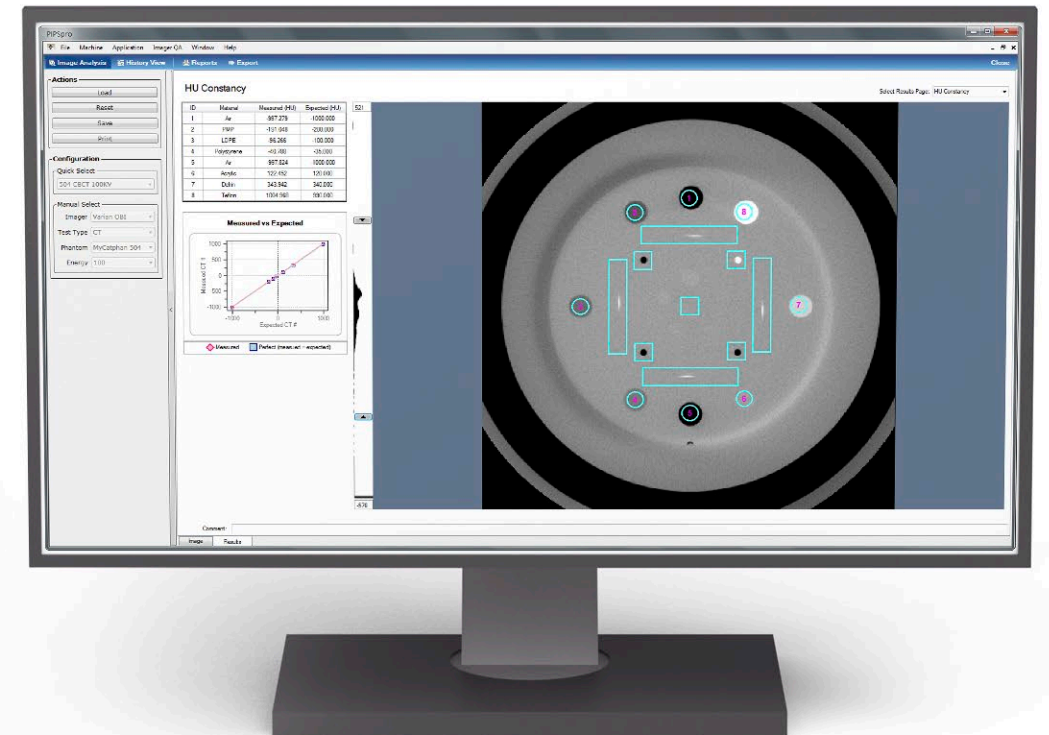
DESIGNED WITH A CONVENIENT AND OPTIMIZED WORKFLOW IN MIND

- Simple, clean and consistent user interface
- Easy-to-read reports, charts, and graphs
- PDF and comma separated variable (CSV) results export
- Multiple open modules for streamlined workflow
- Physicist-controlled editor for creating testing baselines
- Tracking and trending for test results
- Quick Selects™ for organizing tests and accessing test results
- Automatic image compositing for EPID MLC QA and StarShot images
- Centralized database for easy configuration and accessibility to results
- Complete Varian and Elekta IMRT and VMAT logfile analysis
- Workflow automation - single click deployment results
- Now includes Stereotactic collimator rotation



**AUTOMATIC  
REGION  
IDENTIFICATION**

By automatically identifying analysis regions, subjectivity is reduced and results consistency is improved.



### PLANAR IMAGING QA

PIPspro kV planar imaging QA uses images obtained with Standard Imaging's QC-kV1 phantom or Leeds Test Objects' TOR CDR phantom. Testing is supported for kV imagers integrated with linear accelerators as well as images from ExacTrac, Cyberknife, and C-Arms. EPID MV planar imaging QA uses Standard Imaging's calibrated QC-3 phantom.

### CT IMAGING QA

Using cone beam or diagnostic images obtained with any of the Catphan phantoms (503, 504, 600), PIPspro automatically finds analysis image slices and performs required TG-142 tests (geometric distortion, spatial resolution, contrast, HU constancy, uniformity and noise). Results are colored green ("Pass"), amber ("Alert"), or red ("Fail") for easy viewing of status (this scheme is used throughout PIPspro).



## MACHINE QA

QUICK, EASY, PRECISE

### RADIATION LIGHT FIELD ANALYSIS

PIPSpro uses a single image taken with custom phantoms (FC-2, Center Marker) to calculate:

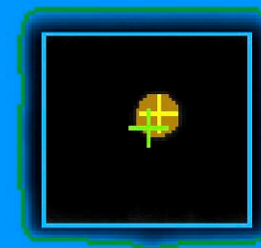
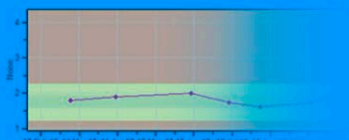
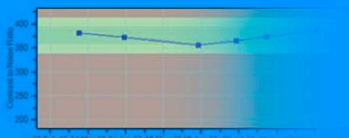
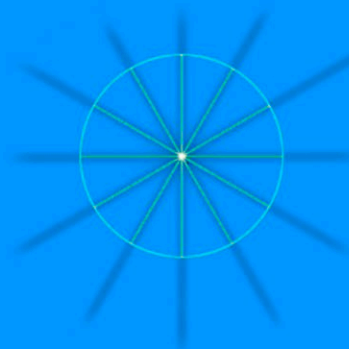
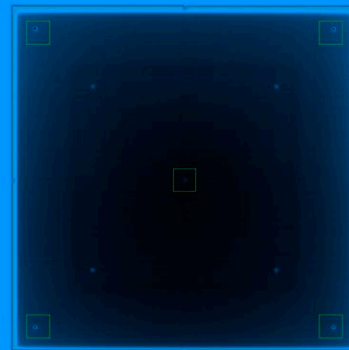
- Radiation and light field coincidence
- Radiation and crosshair displacement
- Light field and crosshair displacement
- Jaw position measurements
- Light field rotation

### STARSHOT ANALYSIS

PIPSpro's StarShot module uses EPID MV or film images to measure rotational deviations in gantry, collimator, and couch mechanical isocenters. Results are expressed as the minimum diameter containing all spokes at the central point of intersection.

### DAILY IGRT QA TRACKING

Use the Standard Imaging MIMI (Multi-Image Modality Isocentricity) phantom with image registration software to calculate known 3D (x, y, z) and 6D (add couch pitch, yaw and roll) offsets. PIPSpro allows you to record your daily offsets and track and trend your results.



### STEREOTACTIC 3D

Use Standard Imaging's Winston-Lutz phantom to measure the difference between the radiation isocenter and the mechanical isocenter for a linear accelerator. A number of images are taken with your portal imager using fixed angles or angles of your choice.

- Automatically load and analyze any images, including DICOM images, for cones or MLC's.
- Automatically get 2D radiation/mechanical offsets for each image.
- Automatically get an optimal 3D offset to correct patient offset errors.
- 3D analysis with x, y, z results that help you improve patient positioning.

COMPLETE MLC QA

COVER ALL TG-142 MLC QA TESTS WITH EPID IMAGES AND LOGFILES

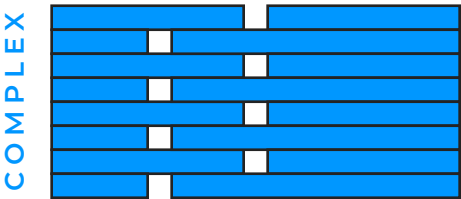
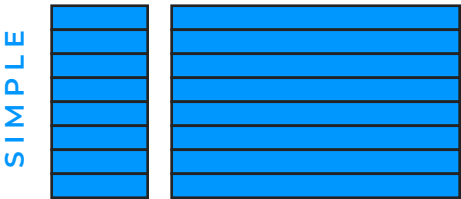
	Image-Based	Logfile-Based
Matched Segments, aka "Picket Fence"	✓	
Setting vs radiation field for two patterns (non-IMRT)	✓	
Travel speed – leaf speed loss (IMRT)*		✓
Leaf position accuracy (IMRT)		✓
Average of leaf and interleaf transmission, all energies	✓	
Leaf position repeatability*		✓
MLC spoke shot	✓	
Coincidence of light field and x-ray field, all energies	✓	
Segmental IMRT (step and shoot) test		✓
Moving window IMRT (four cardinal gantry angles)		✓

\*With logfile-based analysis, PIPSpro is the only commercial software solution able to measure quantitative leaf speed loss and leaf position repeatability.

Adapted from TG-142, TABLE V, Multileaf collimation

PIPSpro MLC QA gives you actionable, quantitative results that allow you to track and trend all TG-142 requirements, delivering critical information that may indicate an impending MLC failure or indicate the need to recalibrate your machine for the best possible clinical outcomes. Step & Shoot and VMAT parameters are tested in any direction using MLC leaf pattern files (\*.mlc, \*.dva, \*.efs).

In simple leaf speed tests, all leaves travel together



In complex leaf speed tests, every other leaf moves, maximizing inter-leaf friction

“PIPSpro is the first commercial machine QA software to determine leaf speed loss. Systems that report only maximum and mean leaf speed cannot be used to calculate leaf speed loss, as required by TG-142.”

SHANNON HOLMES, PH.D.  
MEDICAL PHYSICIST  
STANDARD IMAGING

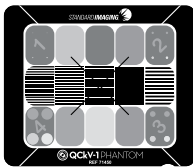
PHANTOMS



QC-3 PHANTOM

CALIBRATED PHANTOM  
REF 71350

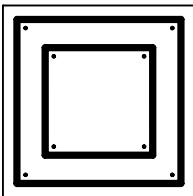
Used to test the image quality from electronic portal imaging devices (EPIDs).



QCKV-1 PHANTOM

CALIBRATED PHANTOM  
REF 71451

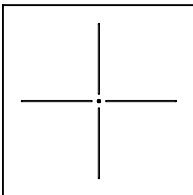
Ideal for kV imaging systems, including Varian, Elekta, BrainLAB and Cyberknife.



FC-2 PHANTOM

REF 72187

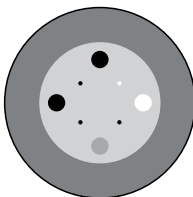
For performing the radiation field vs. light field test and jaw position testing



CENTER MARKER PHANTOM

REF 72247

For performing the radiation field vs. light field test and jaw position testing



CATPHAN

PURCHASED THROUGH  
YOUR LINAC VENDOR

Compatible with model 503, 504, 600 and 604 phantoms



PIPSpro has streamlined our Monthly QA process. It has made the daunting tasks in TG142 manageable. We currently use it for an Elekta Synergy and image quality for our x-rays on our 3 IBA Proton treatment rooms.”

BEN ROBISON  
Medical Physicist  
Provision Radiation Therapy

PIPSPRO SOFTWARE/COMPUTER REQUIREMENTS

- OPERATING SYSTEM — Windows® 10 Professional, 64 bit recommended
- PROCESSOR — Dual Core, 1 GHz; Quad Core, 2 GHz Recommended
- MEMORY — 32-bit OS: 2 GB, 4 GB Recommended 64-bit OS: 4 GB, 8 GB Recommended
- RUNTIME ENVIRONMENT — .NET 4.5.2
- HARD DRIVE — 32 GB or greater, 3 GB free space for software setup.  
Sufficient space to store input image and/or MLC Log files.  
5 GB free space if setting up a local copy of SQL Server Express; 25% free space recommended.
- SCREEN RESOLUTION — 1600×900 (16:9) or higher, 16-bit HiColor or greater
- OPTICAL DRIVE — Digital Versatile Disc(DVD)
- VIRTUAL MACHINES — Must support WMI (Windows Management Instrumentation)
- DATABASE MANAGEMENT — SQL Server 2014 minimum recommended
- CONNECTIVITY — IPv4 LAN, 100 Mbit/s or greater

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# MONTHLY QA

**STANDARDIMAGING®**



[www.standardimaging.com](http://www.standardimaging.com)

**800-261-4446** . PH 608-831-0025 . FAX 608-831-2202

3120 Deming Way Middleton WI 53562 USA