Diagnostic Ultrasound Scanner Quality Control

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Test Protocol

Medical Physics at CancerCare Manitoba has developed its own ultrasound phantom. The following table is intended as a quick reference guide when performing the quality control measurements.

Instructions	Limits	Record
Items Required ultrasound contrast-detail phantom degassed water or coupling gel towels for clean up (optional) lab stand and clamp to hold probe		
Physical check: 1. probe surface for damage 2. control panel for damage 3. display for obvious damage or artefacts	ok/ng ok/ng ok/ng	ok/ng ok/ng ok/ng
Presets check: 1. a QA preset is configured for each probe being tested If a preset is not present then one must be configured.		
Distance measurement accuracy With probe on top of the phantom, measure vertical distance between two targets. Compare to reference distance.	within 5%	distance
With probe on side of phantom, measure horizontal distance between two targets. Compare to reference distance.	within 5%	distance
High-contrast detectability With probe on top of phantom, centre the five columns of non-echogenic cylinders in the image. Freeze and then magnify image. Count the number of: 1. 2 mm cylinders 2. 3 mm cylinders 3. 4 mm cylinders 4. 6 mm cylinders 5. 8 mm cylinders Compare to reference levels.	within 2 within 2 within 2 within 1 within 1	number number number number number

Low-contrast detectability With probe on top of phantom, centre the five columns of -3 dB or -6 dB cylinders in the image. Freeze and then magnify image. Count the number of: 6. 2 mm cylinders 7. 3 mm cylinders 8. 4 mm cylinders 9. 6 mm cylinders 10. 8 mm cylinders Compare to reference levels.	 within 3 within 3 within 3 within 2 within 2	 number number number number number
Maximum depth of visualisation		
Artefact evaluation With probe clean and in air check: 1. vertical streaks or shadows With probe on top surface of the phantom check: 1. vertical streaks or shadows 2. other artefacts	 none none none	 pass/fail pass/fail pass/fail

Annual Medical Physics Review - Ultrasound

Facility		**Department**	
System SN		**System Location**	
System make & model		**Contact Person**	
Date of review		**Time period reviewed**	
Overall QC Program Assessment		*( ) ACCEPTABLE* *( ) ACCEPTABLE but requires remediation* *( ) NOT Acceptable. Immediate action required*	

QC Test	Status	Comments
routine phantom: cylinder visibility		
routine phantom: maximum depth		
routine phantom: artefact check		
routine phantom: distance measurement		
Six Month Review of Routine QC Data		
Monthly Modality Display Performance Test		

Additional Comments:

Overall QC Program Assessment:

Required changes:

Additional Recommendation:

Review conducted by	
Signature	
Date	

Philosophy of Ultrasound Quality Control

Introduction

Quality control (QA) is routine and necessary for the safe use of diagnostic imaging. For example, computed tomography, digital radiography, and magnetic resonance scanners are provided with phantoms and software that automatically perform tests and evaluate the results. This allows the users to easily monitor the performance of their instruments. In contrast, the manufacturers of ultrasound scanners generally provide nothing in the way of end-user quality control. The users of these systems must devise their own QA protocols.

Problem

Although a number of guidelines have been produced for quality control of diagnostic ultrasound scanners (AIUM 1995a, 1995b & 2008; Goodsitt 1999; IPEM 2010) there are, unfortunately, a few problems. Many test were intended for a dedicated hospital medical physicist and consequently are technically challenging. A number of the recommended tests, e.g., dead zone depth and calliper accuracy, were designed about thirty years ago when ultrasound scanners used mechanical probes and analogue electronics. Because modern scanners use array probes and digital electronics, these tests are no longer relevant. Thus, many of the proposed tests are not suitable for routine QA especially in a smaller hospital.

Interestingly, the latest guidelines from the AIUM (2008) include only three image quality tests that make use of a phantom. However, detailed procedures are not given nor is a make or model of phantom is specified. This leads to an additional source of confusion since there are a wide range of phantoms available commercially. These are constructed from either a water-based gel or a urethane rubber. Thus, users must also decide, without much guidance, which phantom to purchase and then devise their own protocols.

Approach

An excellent role model for QA is x-ray mammography. In mammography the most commonly followed guidelines (ACR 1999) specify the exact model of phantom, e.g., RMI-156, and also give detailed instructions on how to score the resulting images. Specifically, images of a contrast-detail phantom are assessed by scoring the visibility of various targets. One advantage of this approach is that the images are evaluated visually (qualitatively), but assigned a numeric score based on the number of visible targets. Consequently, it is both easy to evaluate and record. In this document, a similar approach is taken for ultrasound QA. Consequently, the Department of Medical Physics, CancerCare Manitoba has designed an ultrasound QA phantom. The quality control phantom and related tests were designed to be easy to implement and evaluate. The approach is based on that in mammography where a standardised contrast-detail phantom is used. Images are evaluated visually, but assigned numeric scores that can easily be tracked. This approach also meets the requirements of the latest AIUM guidelines (AIUM 2008).

Design of the Ultrasound QA Phantom

The phantom is illustrated in Figure 1. It consists of an uniform urethane rubber block containing three groups of cylindrical contrast-detail targets. The left-most group of cylinders are non-echogenic (anechoic) and provide high-contrast. The central group of cylinders has a contrast slightly below background (-3 dB) and the right-hand group has a contrast below background (-6 dB). The cylinders have diameters 2, 3, 4, 6, and 8 mm. The 2, 3, and 4 mm diameter cylinders are located at 1 cm intervals, while the 6 and 8 mm cylinders are at 2 cm intervals. Note that the -3 dB group is challenging to visualise and is intended for high performance (possibly future) scan heads. The phantom also includes two columns of wire markers (shown as red dots), which are intended for verification of length and width measurements.

Urethane rubber was chosen because it has a very long service life. One short-coming of urethane is that its acoustic properties differ from tissue. In comparison, a number of phantoms are available that are made using water-based materials that have very good acoustic properties. However, because of desiccation, phantoms containing water are not stable and change in only a few years. Consequently, any detected variations in image quality could be due to changes in the phantom rather than changes in the scanner. Thus, the stability of urethane makes it a good choice when looking for changes in a scanner's performance over many years.

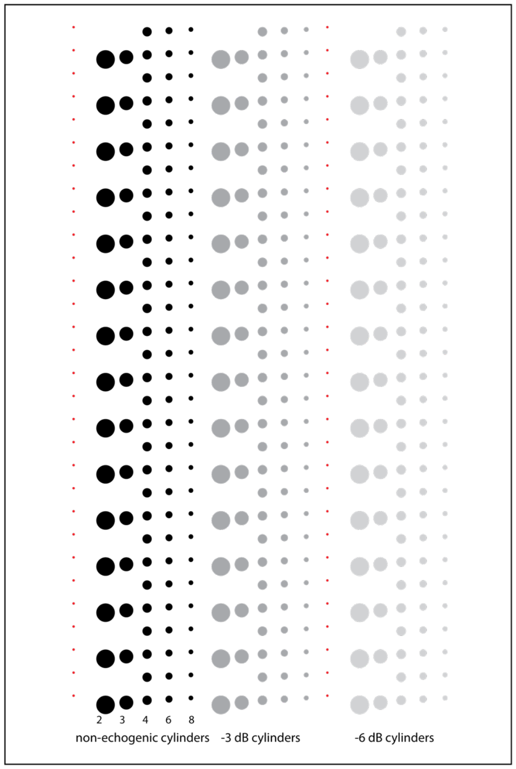


Figure 1. Schematic showing the ultrasound phantom and its targets. The red dots indicate the locations of wire targets used for verifying distance measurements. Dimensions are approximately 22 cm x 33 cm x 7 cm.

Description of Quality Control Tests

acquisition parameters

Ideally, each scanner would have presets dedicated to QA. In general, it is best to acquire one set of images with as little image processing as is possible. For example, disable compound imaging. Set persistence, edge enhancement, and speckle reduction off or to their lowest values. Choose a grey-scale curve (LUT) that is closest to linear. All other imaging parameters, e.g., frequency, transmit power, B-mode gain, depth, and focal zones must be the same each time the images are acquired. In general, system settings will be scanner-specific and will require some work to standardise. To ensure consistency across the province, Medical Physics will provide recommended settings. If QA is performed once every three months, then it is recommended that only one probe be used. Images should be acquired with all probes once per year.

contrast evaluation

The overall idea is to count the number of cylinders that are visualised. Specifically, for two group of cylinders (anechoic and -6 dB), the number of cylinders of each size that are visualised should be recorded. The group of -3 dB cylinders is intended for linear array transducers and may not be visible with a low-frequency curved array. However, at this time the -3 dB group of cylinders are not currently used for routine QA. This results in 10 measurements which are easy to make.

When deciding if a cylinder is visible, one should lean on the side of confidence, i.e., the cylinder must be reasonably circular. An example image of the anechoic cylinders is shown in Figure 2. Visible in this image are three of the 2 mm cylinders, four of the 3 mm cylinders, and ten of the 4 mm cylinders. Similarly visible are eleven of the 6 mm diameter cylinders and twelve of the 8 mm cylinders.

When evaluating images, use what ever magnification works best as long as it is on a frozen image. A magnification of two often works well on the Philips iU22. In the case where one cylinder is missing simply do not count that cylinder. For example, the top four cylinders are visible, fifth one is not visible, and the next three are visible would score seven. It is reasonable to score 1/2 for a cylinder that is partially visible.

Images produced with high-frequency linear array transducers will be easy to score. In comparison, images acquired with low-frequency curved arrays can be challenging. The difficulty will be a large number of cylinders that are partially visible.

The maximum depth at which background echoes are visible should also be recorded. The images should also be evaluated for uniformity, streaks, dead elements and other artefacts.

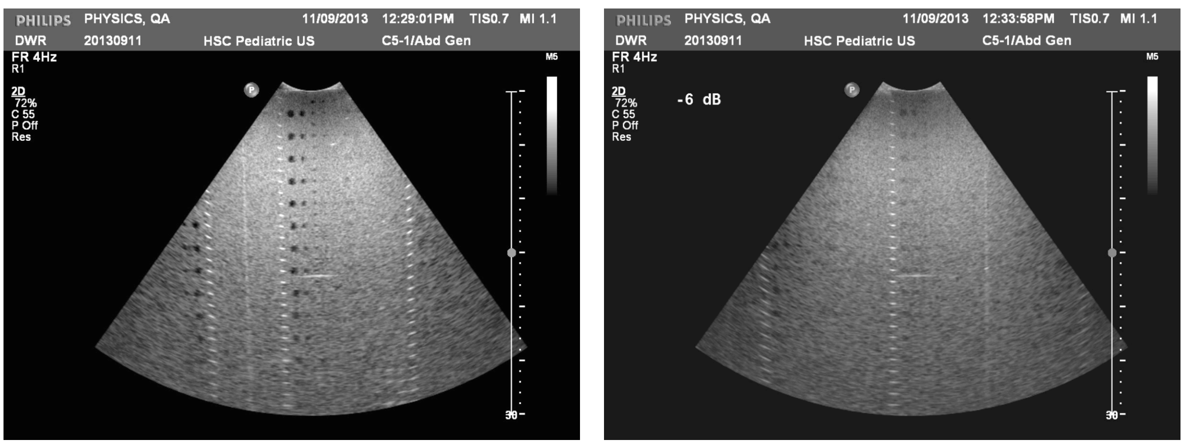


Figure 2. Ultrasound image of (left) anechoic cylinders and (right) -6 dB cylinders.

For routine measurements the same transducer should be used, i.e., matched to the scanner. In general it is easier to score the images made with a linear array. Thus, you may wish to use only the linear for routine QA measurements. When scanning the phantom, it is fine to repositioning the probe to place the cylinders in the centre of the image. However, system settings must be the same each time QA is performed. The only changes allowed are B-mode gain and TGC settings.

Distance Measurement Accuracy

The accuracy of distance measurements is easily verified using the wire markers. For accuracy in the vertical direction, scan the phantom from the top as shown in Figure 3 and measure the distance between two wire markers. In the vertical direction, the adjacent wires will be 1 cm apart. For lateral measurements, turn the phantom 90 degrees and scan from its side as shown in Figure 4. Note that because the acoustic velocity is somewhat lower than the scanner expects, i.e., 1450 m/s instead of 1540 m/s, the distance horizontal measurements will be different than in the vertical case. When using a linear array, the vertical measurements will overestimate the true distance by a factor of 1504/1450 or 1.062. For example, the measured distance between six targets will be 5.31 cm instead of 5 cm. However, horizontal measurements with a linear array will indicate a separation between adjacent wires as 1.0 cm. For a curved array, results of horizontal measurements will depend on the wire separation and depth.

Vertical distance measurements can be made from the leading edge of the target as long as you are consistent. Horizontal measurements should be made with the calliper centred horizontally on the target.

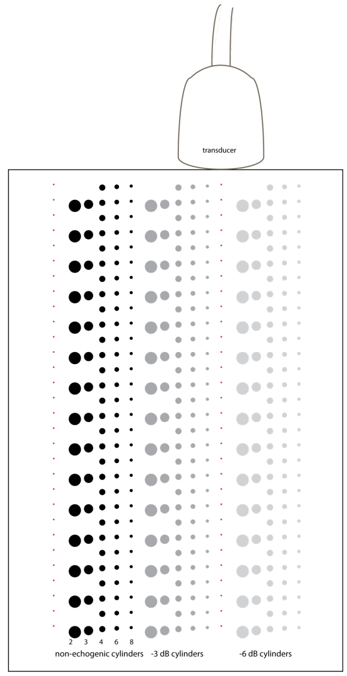


Figure 3. For verifying the accuracy of distance measurements in the axial direction, scan the phantom from the top.

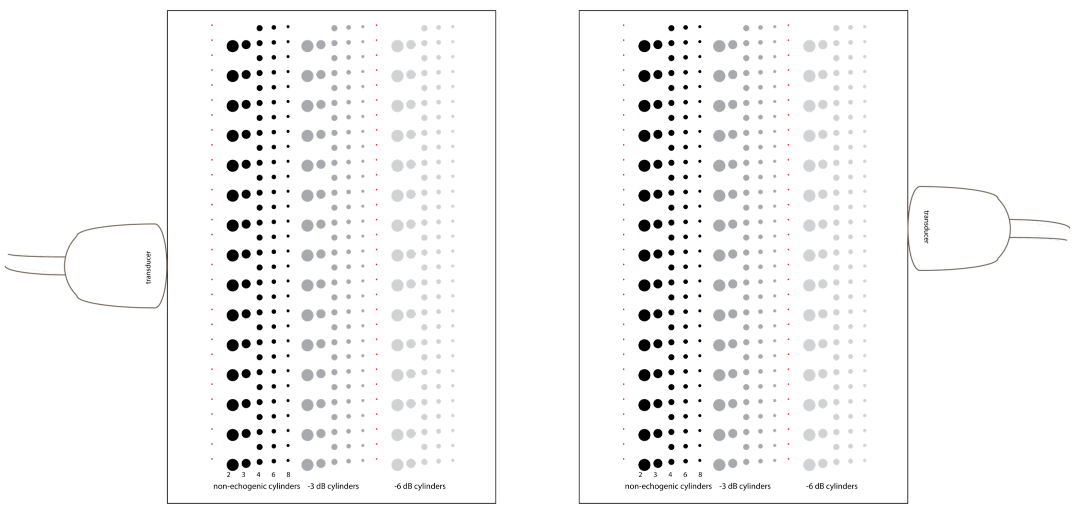


Figure 4. For verifying the accuracy of distance measurements in the lateral direction, scan the phantom from either side.

Recording Results

The way in which the results are recorded can be decided by the facility. However, one possible example is given as Table 1.

Table 1. Typical measurements that would be recorded during routine QA. Note that the -3 dB targets are only used with specific transducers. For routine QA, usually only the non-echogenic and -6 dB cylinders are used.

Date	
Scanner & SN	

Probe	
Preset	

	Number of Cylinders Visible		
Cylinder Diameter (mm)	**non-echogenic**	**-3 dB**	**-6 dB**
2		not used	
3		not used	
4		not used	
6		not used	
8		not used	

	Distance Measurement Accuracy		
	measured (cm)	**expected (cm)**	**difference (cm)**
vertical			
horizontal			

maximum depth (cm)	
any artefacts	

Table 2. Alternative method of recording measurements during routine QA. In this example, measurements for seven dates are recorded on one form.

scanner & SN							
probe							
test							
date							
number of non-echogenic cylinders							
2 mm							
3 mm							
4 mm							
6 mm							
8 mm							
number of -6 dB cylinders							
2 mm							
3 mm							
4 mm							
6 mm							
8 mm							
distance measurements							

vertical							
horizontal							
maximum visualisation depth of background							
depth in cm							
artefacts							
any present							
display quality assurance							
5% & 95% squares visible							
all contrast blocks visible							
any artefacts in uniform images							

Quality Control Recommendations

Medical Physics at CancerCare Manitoba makes the following recommendations:

1. Obtain an ultrasound contrast-detail phantom.
2. Perform baseline testing of a new ultrasound scanner prior to regular patient imaging.
3. Establish a quality control program under the oversight of a medical physicist certified by the Canadian College of Physicists in Medicine.
4. Quality control measurements be performed by the technologists.
5. Routine quality control measurements be performed with the most frequently used ultrasound probe, for example a general purpose abdominal probe.
6. Routine QA be performed every three months.
7. All probes be tested annually.
8. Review the records of routine quality control tests in consultation with a medical physicist at least annually.

Display

Verify performance of the ultrasound scanner's display using a subjective assessment of the SMPTE pattern or equivalent.

Philips iU22 and Epic 7

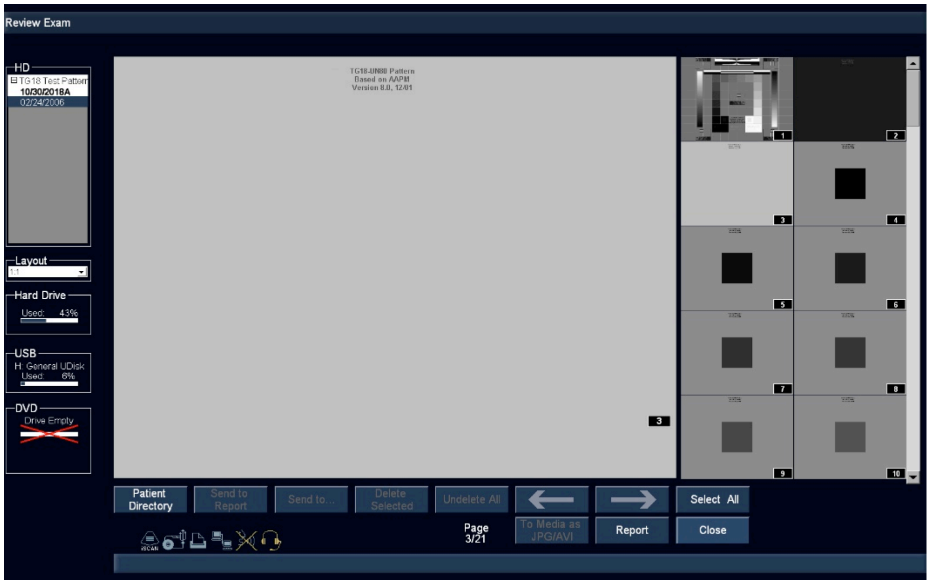
On the Philips iU22 and Epic 7, the test patterns are stored as a patient and need to be imported through the exam review menu as shown below.

Figure Exam review menu on the Philips Epic 7 used to import the test patterns. The iU22 has a similar exam review menu. The TG18 patterns are preferred.

The most important test is the SMPTE pattern as shown below. See the complementary guidance document, “Modality Display QC Instructions” for more information on how to interpret the SMPTE pattern. The Epic 7 will allow you to zoom the image to encompass the entire display (it’s not clear if the iU22 has the same feature).

Figure SMPTE pattern on the Philips iU22. The Epic 7 will be similar. If possible, enlarge the pattern to fill the entire display.

There are two other images that are of interest. These are the TG18-UN80 and TG18-UN10 uniform brightness images and these are shown below. With these check the display for any pixels that appear too bright or too dark. Also look for any artefacts including nonuniformities.



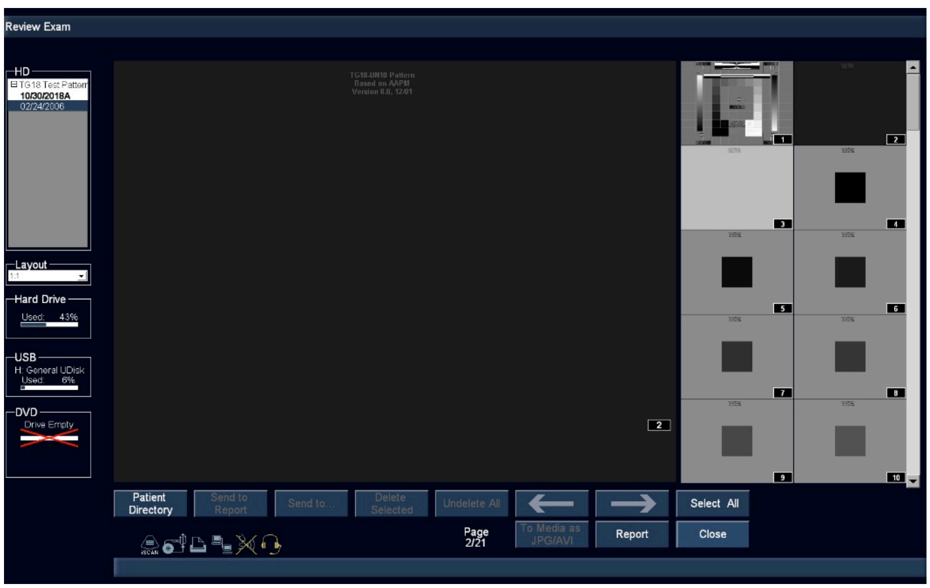


Figure TG18-UN80 and TG18-UN10 uniformity images. Use these to check for bad pixels and other artefacts. If possible, enlarge the pattern to fill the entire display.

General Electric Logic E9

The display test patterns on the GE Logic E9 are accessible through the *utility* menu shown below.

Figure Utility menu on GE Logic E9. This provides access to the test patterns.

The most important test is the SMPTE pattern as shown below. See the complementary guidance document, “Modality Display QC Instructions” for more information on how to interpret the SMPTE pattern.

Figure SMPTE pattern on the GE Logic E9.

One other image that is of interest is the uniform grey image shown below. With this check the display for any pixels that appear too bright or too dark. Also look for any artefacts including nonuniformities.

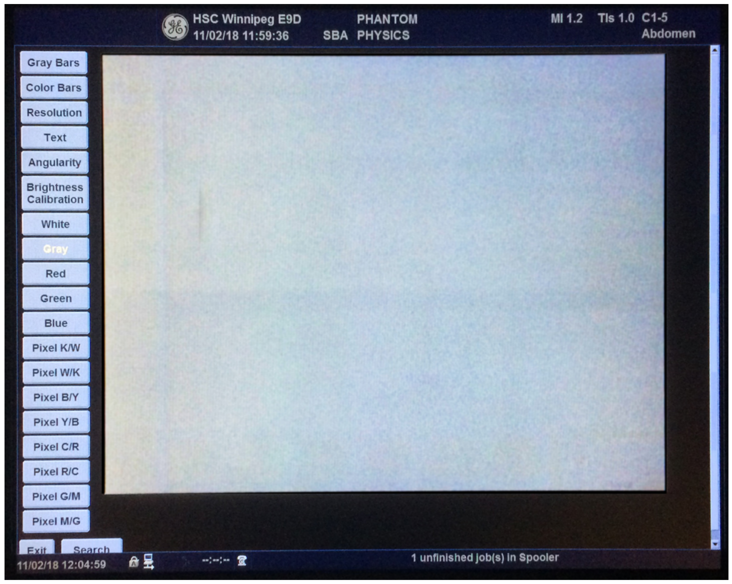


Figure Photograph showing the grey uniformity image on a GE Logic E9. Use this to check for bad pixels and other artefacts. In this example a number of streaks are visible and this display may need to be replaced.

References

ACR "Mammography quality control manual" 1999

AIUM "Standard methods for measuring performance of pulse-echo ultrasound imaging equipment" 1991.

AIUM "Methods for measuring performance of pulse-echo ultrasound imaging equipment part II: digital methods stage 1" 1995a.

AIUM "AIUM quality assurance manual for gray-scale ultrasound scanners: stage 2" 1995b.

AIUM "Routine quality assurance for diagnostic ultrasound equipment" 2008.

Brooks KW, Trueblood JH, Kearfott KJ. Subjective evaluations of mammographic accreditation phantom images by three observer groups. Invest Radiol. 1994 Jan;29(1):42-7.

Dudley NJ, Griffith K, Houldsworth G, Holloway M, Dunn MA. A review of two alternative ultrasound quality assurance programmes. Eur J Ultrasound. Mar;12(3):233-45 2001.

Goodsitt, M.M., Carson, P.L., Witt, S., Hykes, D.L. & Kofler, J.M. Real-time B-mode ultrasound quality control test procedures. Report of AAPM Ultrasound Task Group No. 1. *Medical Physics* **25**, 1385-1406 1998.

IPEM "Quality Assurance of Ultrasound Imaging Systems" Report No 102, 2010.

IPSM "Routine quality assurance of ultrasound imaging systems" Report No 71 1995.

System Configurations

For quality control it is important that the system be configured the same each time images are acquired. The following tables show system settings that can be entered and then saved as a QA preset.

Table 3 System settings used for a Philips iU22. Once the settings are configured for a probe, they can be set as a "quick save preset". Use the "Quick Save" key on the keyboard to save a preset. A separate preset is necessary for each probe, so it is easier if you give a descriptive name such as, "QC_C51".

Probe	C5-1
Initial Preset	Abdomen General
XRES	off
SonoCT	off
Harmonics	off
2D Opt	Res
RES/SPD	Maximum Res
Depth	30 cm

Grey Map	5
Compress	55
Output Power	full
2D PRF	med
Persistence	off
Chroma Map	off
focus	centre & maximum height

Probe	L12-5
Initial Preset	MSK General
XRES	off
SonoCT	off
Harmonics	off
2D Opt	Gen
RES/SPD	Maximum Res
Depth	8 cm

TAC (if available)	TAC1
Grey Map	5
Compress	55
Output Power	full
2D PRF	med
Persistence	off
Chroma Map	off
focus	centre & maximum height

Probe	L9-3
Initial Preset	MSK General
XRES	off
SonoCT	off
Harmonics	off
2D Opt	Gen
RES/SPD	Maximum Res
Depth	maximum
2D Gain	63%

TAC (if available)	TAC1
Grey Map	5
Compress	55
Output Power	full
2D PRF	med
Persistence	off
Chroma Map	off
focus	centre & maximum height

If 2D Opt cannot be set to "Gen", then choose "Pen".

Probe	L17-5
Initial Preset	MSK General
XRES	off
SonoCT	off
Harmonics	off
2D Opt	Gen
RES/SPD	Maximum Res
Depth	7 cm

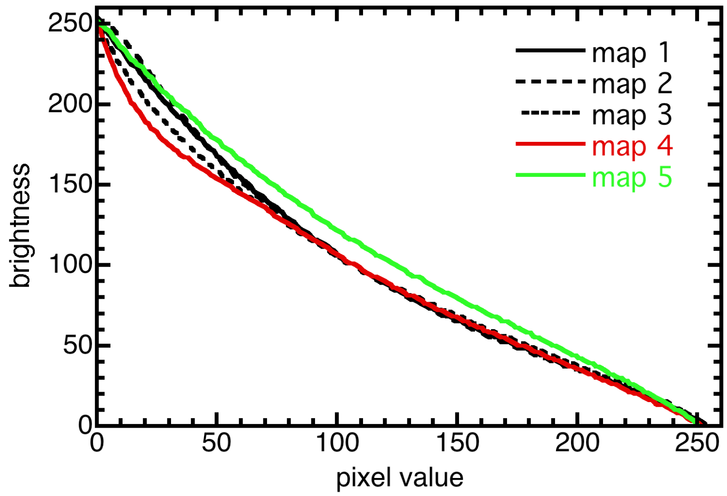
TAC (if available)	TAC1
Grey Map	5
Compress	55
Output Power	full
2D PRF	med
Persistence	off
Chroma Map	off
focus	centre & maximum height

Probe	C8-4V
Initial Preset	Pelvis EV
XRES	off
SonoCT	off
Harmonics	off

Grey Map	5
Compress	55
Output Power	full
2D PRF	med

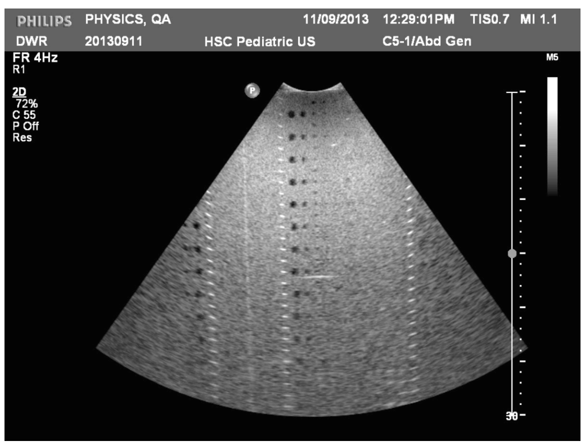
2D Opt	Pen
RES/SPD	Maximum Res
Depth	16 cm
2D Gain	70%

Persistence	off
Chroma Map	off
Focus	centre & maximum height
Sector Width	maximum

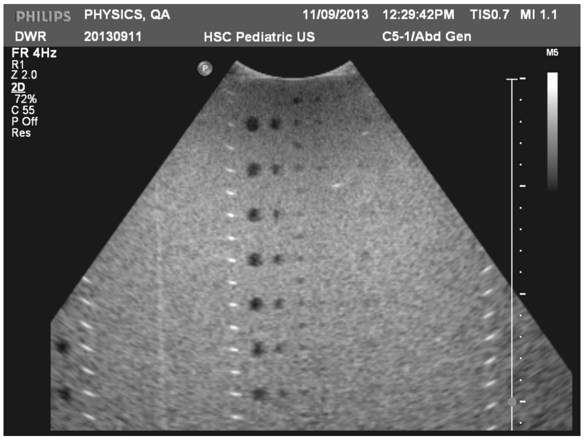


On the iU22, grey map 5 is the closest to linear. Thus it was selected for use in QA.

To analyse images, use a frozen image; do not use a live display. Use the zoom control to give two-times magnification, i.e., “Z2.0”. Note: only turn the zoom control, do not press it as this can change the acquisition parameters.



Acquire a full image with one column of the contrast targets centered in the image.



To aid scoring, zoom the frozen image by a factor of two and save the top and bottom halves separately.

Table 4. Typical values that would be recorded during routine QA for an iU22.

Date	**2018-09-28**
Scanner	**iU22 SN 039VYY**
Probe	**C5-1**
Preset	**"QA"**

	Number of Cylinders Visible		
Cylinder Diameter (mm)	**- 6 dB**	**non-echogenic**	**-3 dB**
2	**0**	**3**	**NA**
3	**2**	**4**	**NA**
4	**7**	**20**	**NA**
6	**10**	**11**	**NA**
8	**11**	**12**	**NA**

	Distance Measurement Accuracy		
	measured (cm)	**actual (cm)**	**difference (cm)**
vertical		**spacing x 1.062 cm**	
horizontal			

Table 5 System settings used for a Philips EPIQ 7. Once the settings are configured for a probe, they can be set as a "preset. Use the "Save Preset" button on the touch panel to save a preset. A separate preset is necessary for each probe, so it is easier if you give a descriptive name such as, "QC_C51".

Probe	C5-1
Initial Preset	Abd General
XRES	off
SonoCT	off

Depth	30 cm
Grey Map	5
Dyn Range	55
Output Power	0.0 dB

Harmonics	off		Persistence	off
2D Opt	Res		Chroma Map	off
RES/SPD	Maximum Res R1		focus	centre & maximum height

Probe	L12-5		TAC (if available)	TAC1
Initial Preset	MSK Gen		Grey Map	5
XRES	off		Dyn Range	55
SonoCT	off		Output Power	0.0 dB
Harmonics	off		Persistence	off
2D Opt	Gen		Chroma Map	off
RES/SPD	Maximum Res R1		focus	centre & maximum height
Depth	8 cm			

Probe	L9-2		Depth	24 cm
Initial Preset	MSK Gen		Grey Map	5
XRES	off		Dyn Range	55
SonoCT	off		Output Power	full
Harmonics	off		Persistence	off
2D Opt	Gen		Chroma Map	off
RES/SPD	Maximum Res R1		focus	centre & maximum height

Probe	L18-5		TAC (if available)	TAC1
Initial Preset	MSK Gen		Grey Map	5
XRES	off		Dyn Range	55
SonoCT	off		Output Power	0.0 dB
Harmonics	off		Persistence	off
2D Opt	Gen		Chroma Map	off
RES/SPD	Maximum Res R1		focus	centre & maximum height
Depth	7 cm			

Table 6 System settings used for a Philips HD11XE. Note that for this scanner the QA presets for each probe will need to be saved with a different name, e.g., “QA C5-2” and “QA L12-5”.

Probe	C5-2		Smooth	1
Initial Preset	Abdomen General		Grey Map	k
XRES	off		Compress	8
SonoCT	off		Output Power	full
Harmonics	off		Persistence	0
Frequency	5 MHz (resolution)		Chroma Map	off
Gain	100		Focus	one at 10.5 cm deep
Depth	22 cm			

Probe	L12-5		Smooth	1
Initial Preset	Abdomen General		Grey Map	k
XRES	off		Compress	8
SonoCT	off		Output Power	full
Harmonics	off		Persistence	0
frequency	12 MHz (resolution)		Chroma Map	off
gain	100		Focus	one at 10.5 cm deep

Depth	8 cm			

Table 7 System settings used for a General Electric Logic 9. Note that for this scanner the QA presets for each probe will need to be saved with a different name, e.g., “QA 4C” and “QA M12L”.

Probe	4C		Cross beam	off
Frequency	4.0 MHz		Line density	4
DR	57		Rejection	0
Gain	29%		Edge enhance	0
Grey map	H		Frame average	0
Focus	70% of depth		Diff	off
Depth	30 cm		Softner	off
SRI	off		Suppression	0
AO	100%		Compression	1
Width	68			

Probe	M12L		Cross beam	off
Frequency	12.0 MHz		Line density	(maximum)
DR	57		Rejection	0
Gain	40%		Edge enhance	0
Grey map	H		Frame average	0
Focus	5.25 cm 58%		Diff	off
Depth	10 cm		Softner	off
SRI	off		Suppression	0
AO	100%		Compression	1
			Virtual Convex	off

Table 8 System settings used for a General Electric Logic E9. After making the preset for each probe, look in *Utility:Imaging:General and set default mode to “B”.* It is easier to set the following parameters in *Utility:Imaging:B*. Make sure CHI is disabled after selecting the preset. Note that for this scanner the QA presets for each probe will need to be saved with a different name.

Probe	C1-5		Cross beam	off
Frequency	5.0 MHz		Line density	4
DR	57		Rejection	0
Gain	58%		Frame average	0
Grey map	H		Image Width	70
Focus	1 @ 57%		Suppression	0
Focus width	6		SRI	0
Depth	32 cm		Power	Maximum

Probe	9L		Cross beam	off
Frequency	9.0 MHz		Line density	4
DR	57		Rejection	0
Gain	52%		Frame average	0
Grey map	H			
Focus	1 @ 67%		Suppression	0
Focus width	0		SRI	0
Depth	20 cm		Power	Maximum

Probe	C1-6		Cross beam	off
Frequency	6.0 MHz		Line density	4
DR	57		Rejection	0
Gain	58%		Frame average	0
Grey map	H		Image Width	maximum
Focus	1 @ 57%		Suppression	0
Focus width	2		SRI	0
Depth	32 cm		Power	Maximum
			speed of sound	1460 m/s

Probe	ML615		Cross beam	off
Frequency	15.0 MHz		Line density	4
DR	57		Rejection	0
Gain	52%		Frame average	0
Grey map	H			
Focus	1 @ 67%		Suppression	0
Focus width	0		SRI	0
Depth	12 cm		Power	Maximum

Probe	C2-9		Cross beam	off
Frequency	9.0 MHz		Line density	4
DR	57		Rejection	0
Gain	58%		Frame average	0
Grey map	H		Image Width	maximum
Focus	1 @ 57%		Suppression	0
Focus width	2		SRI	0
Depth	12 cm		Power	Maximum

Probe	IC5-9		Cross beam	off
Frequency	9.0 MHz		Line density	4
DR	57		Rejection	0
Gain	48%		Frame average	0
Grey map	H		Image Width	maximum
Focus	1 @ 57%		Suppression	0
Focus width	0		SRI	0
Depth	8 cm		Power	90%

Table 8 System settings used for a Toshiba Aplio 80. Note that for this scanner the QA presets for each probe will need to be saved with a different name.

Probe	Curved Array		Aplipure	0
Frequency	4 MHz		2D post process	0
Depth	30 cm		2D AGC	0
focus	1 at 16 cm		2D time smooth	0
Power	Maximum		2D edge enhance	0
2D map	1		2D psel	0
2D DR	65		2D THI	off

Probe	10L4		Aplipure	0
Frequency	9.2 MHz		2D post process	0
Depth	14 cm		2D AGC	0
focus	1 at 7 cm		2D time smooth	0
Power	Maximum		2D edge enhance	0
2D map	1		2D psel	0
2D DR	65		2D THI	off

Table 9 System settings used for a Toshiba AplioXG. Note that for this scanner the QA presets for each probe will need to be saved with a different name.

Probe	PLT-805AT orange		precision	0
Frequency	12 MHz		Aplipure	0
Depth	10 cm		2D time smooth	0
focus	1 at 5 cm		2D edge enhance	0
Power	Maximum		2D post process	0
2D map	5		2D AGC	0
2D DR	65		2D psel	0

Probe	PLT-1204BX purple		precision	0
Frequency	14 MHz		Aplipure	0
Depth	7 cm		2D time smooth	0
focus	1 at 3 cm		2D edge enhance	0
Power	Maximum		2D post process	0
2D map	5		2D AGC	0
2D DR	65		2D psel	0