Hardware:

1. Windows PC.

Software:

1. Matlab with Image Processing Toolbox.

Images:

1. Localiser, T1 and T2 images are all within their own directory (3 different image folders in total). This is normally done by the scanner during image saving process and this is true for our Skyra, Prisma scanners and another Toshiba scanner. User may need to confirm it on their own scanner.
2. The measurement results will be saved to the directory where the 3 image folders locate. At the end, there are four components under each day’s folder: localiser, T1 and T2 image folders and results.
3. ACR doc recommends to acquire a dual-echo T2 image (22 images in total) and use the 2nd echo images. If the number of images in T2 folder is more than 11, then program assumes the above is true. If the number is 11, then it assumes the scanner cannot acquire dual-echo T2 image and use the available images in the folder.
4. The program assumes the images were acquired following the ACR manual, phantom positioning, 11 (or 22) slices, starting and ending slice selection and etc. One of errors from the program is due to wrongly acquired image.
5. The program ID slices based on the slice InstanceNumber. This means the image needs to be acquired sequentially, NOT “inter-slice”ly. Otherwise, the slices will be found wrongly. On Siemens scanner (Skyra), this is a parameter option. If user has the same scanner, then radiographer at your centre may know where to find this setting. If not, user is welcome to contact CMN (Calvary Mater Newcastle) hospital to share this information. For other scanners, user may want to contact vendor for this.

If the local centre scanner is constantly set to the “inter-slice” acquisition for most scan, then user may want to consider to change code slightly. The part of code to change is in “fun\_ACR\_FindSlice.m”.

This problem can be solved by using phantom feature to ID slice like what Catphan program does. User is welcome to implement this.

1. Due to the phantom leakage (normal for liquid filled phantom), vertical phantom diameter measurement may give false fail result and the phantom centre may be calculated wrong. One solution that is implemented in the software is to attach an external pill (e.g. Vitamin E pill) to slice 1, 5, 7 and 11. The current program assumes the phantom wall thickness is 6 mm and pill radius is 4 mm. Wall thickness was calculated from experiment on phantom CT image. Depending on the markers used at local centre, the pill radius can be changed in “fun\_ACR\_1\_S1.m”, “fun\_ACR\_1\_S5.m”, “fun\_ACR\_3\_S1.m”, “fun\_ACR\_4\_S1S11.m“, “fun\_ACR\_5\_S7.m” and “fun\_ACR\_6\_S7.m”. “fun\_ACR\_7\_S8S9S10S11.m” has not yet included this because low contrast test is done manually.