

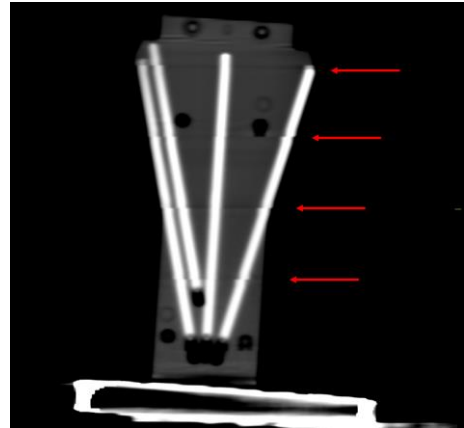
Scan Protocol – Stereotactic Localization

How to scan data for Proper Stereotactic Localization in Brainlab:

- iPlan 2.x
- iPlan 3.x
- Trajectory 2.0

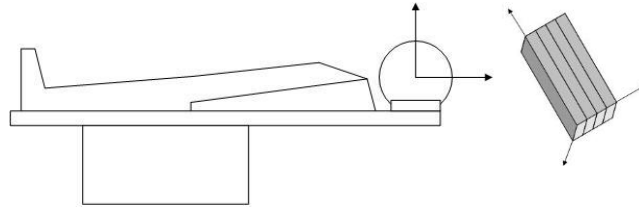
General Information	<ul style="list-style-type: none"> • Brainlab recommends stereotactic localization based on CT images. • Stereotactic localization based on MR images is not as accurate and reliable as it is for CT images
FoV (Field of View)	<ul style="list-style-type: none"> • All localizer rods must be completely visible in the slices • The localizer rods must not touch the edge of the scan area • Include the region of interest • Do not include the table in the field of view • It is recommended to scan the full localizable range (i.e. the complete localizer geometry) <p>Warning:</p> <ul style="list-style-type: none"> • Always use stabilization ring when scanning Inomed / Fischer Rev. R or Rev. U localizer • Especially when using Inomed (Rev. U, Rev. R) or Fischer (Rev. U, Rev. A) localizer, scanning only a few slices might annul safety features in case of too many ignored slices. • Localizer plates must be mounted according to manufacturer specifications to prevent misdetection of rods. <p><i>NOTE: Trajectory 2.0 (Stereotaxy Element) does not support Fischer localizers. Only Inomed Rev. U and Inomed Rev. R are supported by this application.</i></p>
Patient Setup	<ul style="list-style-type: none"> • Strict supine position • Orientation “Head first” (recommended) or “Feet first”
Slice Thickness	<p>Sequential scans</p> <ul style="list-style-type: none"> • 1-2 mm, contiguous or overlapping slices. • Do not scan with gap <p><i>NOTE: Slice distance of 1 mm is recommended in most cases for CT-only localizers. For combined localizers suitable for CT as well as MR, a slice distance of 2mm is acceptable for CT scans as well.</i></p> <p>Spiral/Helical scans</p> <ul style="list-style-type: none"> • Pitch (table-scan ratio) = 1:1 • Reconstructed images are allowed (slice increment less than or equal to 2mm) • Slice distance can be changed during the scan
Scan Directions	<ul style="list-style-type: none"> • Cranial to caudal
Image/ Pixel Size	<ul style="list-style-type: none"> • Pixel size must be square • Must remain the same during the scan
Table Height	<ul style="list-style-type: none"> • Must remain the same during the scan
Image Compression	<ul style="list-style-type: none"> • Save images in uncompressed format
Matrix Size	<ul style="list-style-type: none"> • Recommended: 512 x 512

<p>Scan Modalities, Properties</p>	<p>CT</p> <ul style="list-style-type: none"> • Axial only • Contrast agents allowed • Scan for soft tissue windowing (with kernel of about 40) <p>Warning: CT scans acquired for localization must not show artifacts like shown in screenshot on the right.</p> <p>MR</p> <ul style="list-style-type: none"> • Stereotactic localization based on MR images is not as accurate and reliable as it is for CT images, as e.g. distortions from the magnetic field of the scanner might occur. • The preferred solution for planning the treatment and calculating stereotactic settings is an accurately localized CT image series fused to a diagnostic MR image series • The localization accuracy depends on: <ul style="list-style-type: none"> - Image distortions - Changing gray values (caused by e.g. bias field) - Intrinsic limitations of MR localization equipment, like e.g. insufficiently visible localizer rods (imaging fluids) or smaller radial geometry of localizer geometry - Use of non-rigid/stable MR compatible materials (plastic plates) - Less localizer rods in coronal or sagittal scanning orientation <p>Warning: MR scans acquired for localization must prioritize localization quality over diagnostic quality. Brainlab recommends creating separate scans for localization and tissue definition. Using a scan with insufficient scan data for localizing a patient could cause critical injury.</p> <ul style="list-style-type: none"> • If you decide to use an MR for localization, you must fulfill the following minimum requirements: <ul style="list-style-type: none"> - Assure low distortion (over the entire scanned area) - Scan with T1-weighting to provide low distortion and good representation of rods • Verify that the contrast of the scanned localizer rods and surrounding area does not vary significantly within the scanned area • Always use 3D distortion correction if available <p>NOTE: <i>Trajectory 2.0 (Stereotaxy Element) supports CT with axial and MR with axial or coronal orientation.</i> <i>iPlan Stereotaxy supports CT with axial and MR with axial, sagittal or coronal orientation.</i></p>
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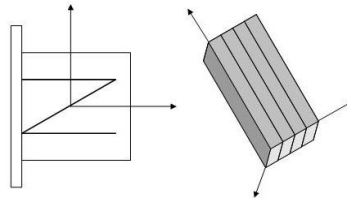


**Gantry Tilt/
Angulation**

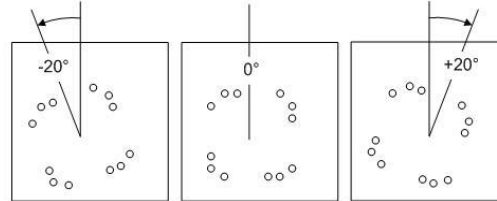
- Image set gantry tilt or obliqueness (scanned slices are oblique to patient table) can be up to +/- 5 degrees in all directions. Positive and negative values are allowed, but have to remain the same during the scan:



- The total resulting obliqueness of the localizer geometry relative to the scanned slice can be up to +/- 10 degrees in all directions:



- The localizer can rotate effectively within the slice up to +/- 20 degrees:



If you need additional information, please contact your local Brainlab representative.