Print and recognize

The exact reference artwork used by the app, with physical-size calibration and a foldable cube net.

1. Print accurately. Use white matte A4 paper, 100% / Actual Size, colour for the three sphere images, and no scaling or mirroring. Turn off borderless enlargement. Measure the 50 mm ruler on every page you print. Reprint if its length is wrong.

2. Apply the matching dimensions. Open Tracking and select **Use supplied 40 mm print pack**. This sets the complete RedSphere, GreenSphere and BlueSphere images to 40 mm and the active QR squares to 40 mm. ArUco and AprilTag squares remain fixed at 30 mm; the cube body is 40 mm.

3. Choose the matching target. Import a dataset and assign it to the physical target you will show. Enable that target in Tracking. Enter full-screen AR on iPhone/iPad, or an immersive space on Vision Pro. Allow camera or world-sensing access. Move slowly in good light until world tracking is active, then show the print.

4. Inspect and manipulate. Keep the print visible for live tracking, or use the app's lock action after checking alignment. Move, Rotate and Scale affect the assigned content. Slice mode changes the selected axial, coronal or sagittal plane without moving the target. Reconnect clears session placements; recognize or place them again.

5. Keep existing custom prints. The 40 mm preset is optional and must match what you measured. Existing custom widths remain unchanged unless you apply it. Prior app-generated QR patterns are retained as compatibility references; arbitrary QR encodings of the same text may not match visionOS image tracking.

Pack contents

Page 2: RedSphere / GreenSphere / BlueSphere - 40 mm complete images.
Page 3: ArUco ID 10 and AprilTag ID 0 - 30 mm active squares.
Page 4: five cube face markers - 30 mm active squares.
Page 5: 40 mm cube net with exact face orientation.
Page 6: QR A and QR B - 40 mm active squares, with quiet zones.

Image recognition quality depends on lighting, distance, focus and the device. These targets support app placement and visualization; printing them does not establish clinical registration accuracy.

MEASURE: 50 mm from end to end



0 50 mm

Reference image targets

Each complete square below is exactly 40 x 40 mm. Print in colour, keep the complete artwork and leave surrounding white paper.

RedSphere



Target 22 | complete width 40 mm

GreenSphere



Target 23 | complete width 40 mm

BlueSphere



Target 24 | complete width 40 mm

Calibration: measure the entire square image, including its original printed border and all colours. Do not measure only the centre motif. In Tracking, the RedSphere, GreenSphere and BlueSphere widths must match your measured print.

Recognition: these are image-reference targets on both iOS and visionOS. The colour in each filename identifies its saved target slot; do not substitute or recolour one image for another. Keep them flat and avoid glossy reflections.

MEASURE: 50 mm from end to end

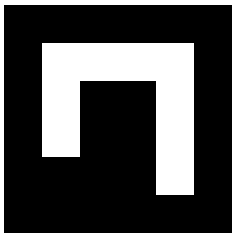


Flat fiducial targets

Exact original marker pixels. Each active square below is 30 x 30 mm; white paper outside it is the quiet zone.

ArUco marker

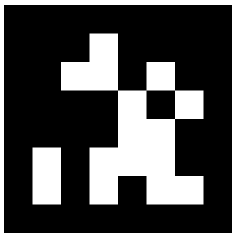
DICT_4X4_50 | ID 10



Target 2 | active width 30 mm

AprilTag marker

36h11 | ID 0



Target 3 | active width 30 mm

Measure the black outer square. The active square includes the marker's black border. Keep at least 5 mm of white paper around it. Do not crop, stretch, invert, mirror or redraw the code. Cut well outside that white area if mounting it on a card.

Apple tracking: both markers are registered as exact native image references. iOS exposes validation results in tracking diagnostics; a reference rejected by the device cannot produce a pose. Use a supported reference image or a virtual surface target if needed.

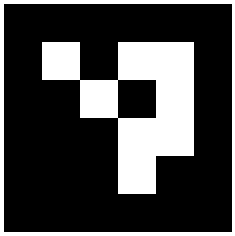
MEASURE: 50 mm from end to end



Cube face markers

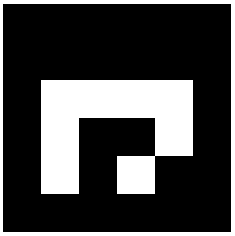
For mounting on an existing 40 mm cube: centre one 30 mm active marker on each required face, with 5 mm white margin on every side.

ID 0 - TOP



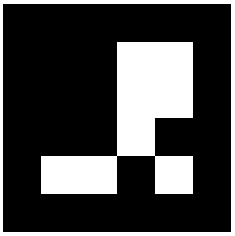
30 mm active square

ID 1 - FRONT



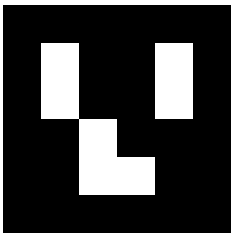
30 mm active square

ID 2 - RIGHT



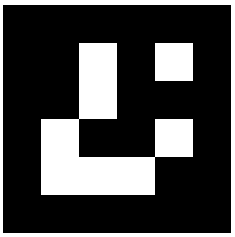
30 mm active square

ID 3 - BACK



30 mm active square

ID 4 - LEFT



30 mm active square

Orientation: front ID 1, right ID 2, back ID 3 and left ID 4 are upright when viewed from outside. Top ID 0: its printed top edge points toward the back face (ID 3), and its right edge toward ID 2. The bottom requires no marker. Page 5 provides a pre-oriented net.

MEASURE: 50 mm from end to end

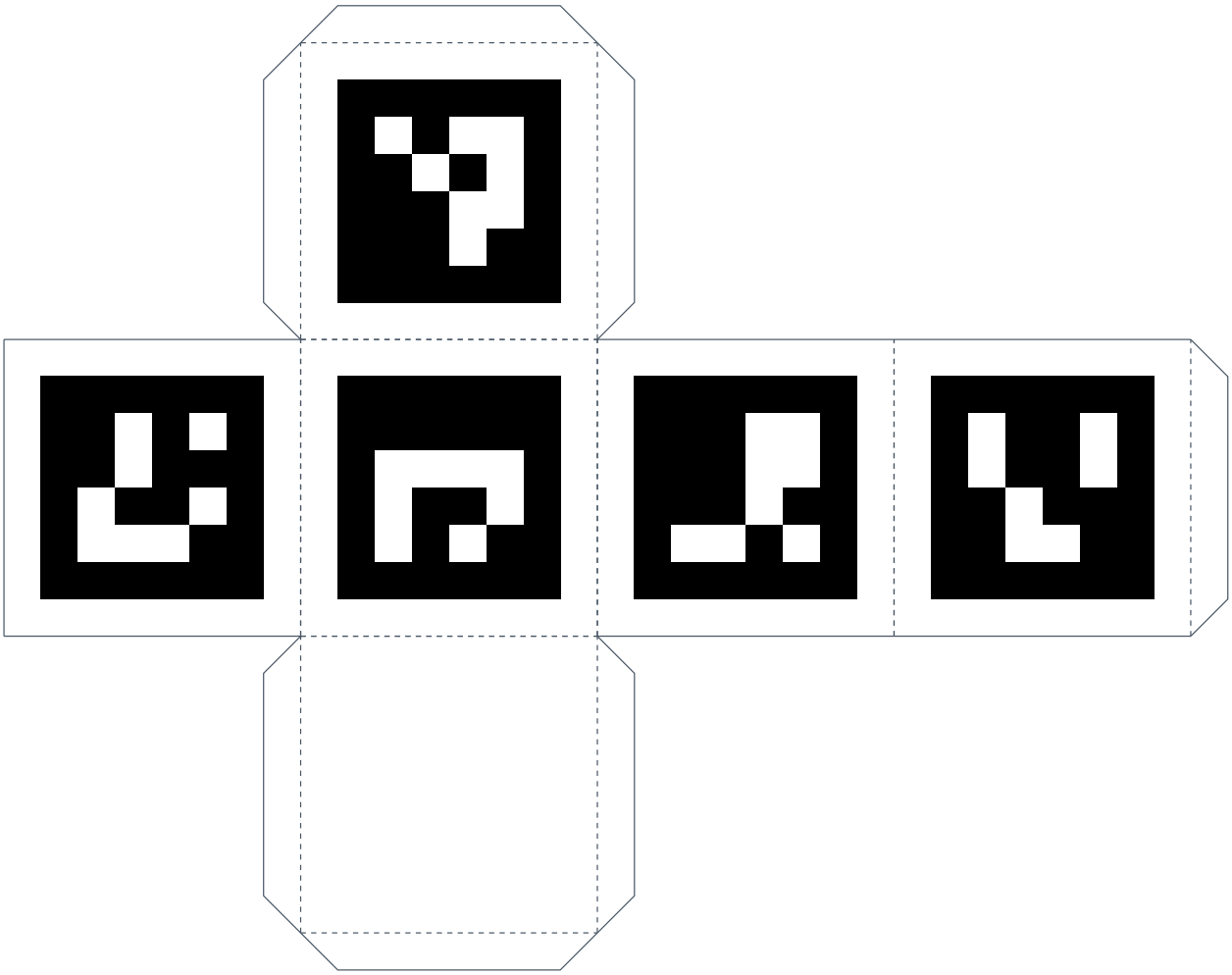


0 50 mm

40 mm cube net - actual size

Cut around the outer boundary and glue tabs. Fold dashed lines inward so the printed markers face outward. Keep all faces square and flat.

Left to right across the middle row: **LEFT 4 | FRONT 1 | RIGHT 2 | BACK 3**.
The top flap carries **ID 0**. The blank bottom flap closes the cube. Do not rotate individual markers.



Check after assembly: each face is 40 x 40 mm; each black active marker is 30 x 30 mm. Use stiff matte card or attach the net to a rigid cube. The target origin is the centre of the front ID 1 marker, not the cube centre: +X right, +Y up, +Z outward from the front.

MEASURE: 50 mm from end to end

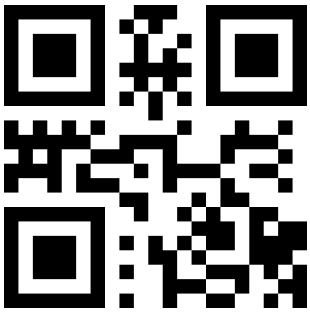


QR A and QR B

Each black active QR square is exactly 40 x 40 mm. Its four-module white quiet zone is outside the measured active width.

QR A

ARUCO-A-QR-01

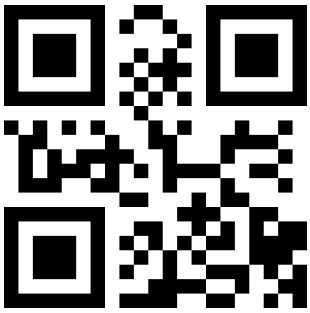


Active square 40 mm

Full white-padded image 55.238 mm

QR B

ARUCO-A-QR-02



Active square 40 mm

Full white-padded image 55.238 mm

App setting: QR A active side = 40 mm; QR B active side = 40 mm. Measure from one outer black edge of the QR square to the opposite edge. Do not include the white margin. Leave at least 7.62 mm of untouched white paper around these active squares.

Compatibility: these exact active PNG pixels are bundled in Build 17 for visionOS reference matching. iPhone and iPad decode the existing payload text with Vision. The older Core Image-generated templates remain recognized on visionOS. Any other generator can produce different pixels, even with the same payload.

MEASURE: 50 mm from end to end



0 50 mm