The formX Object speci fied by tbeen tryis sbject to the foll owingrestriction s ; failure to abi de by themoudresulin msalign ren $t$ of the overl ay wi th the ren dered 3D gr aphics:

- The formX Object is associ ated with a specific view(n ot wi th the carara posi ti on defin edby the 3D viewdiction ary). It shou don ly be drawn when the weer n avi gates usi n gthe 3 D vi ewn ot when the wer happen s to n avi gate to the sare ori en tation by ran ul rean s.
- It shoul don ly be drann if the ar tworkto-worldratrix has $n$ ot been al tered.
- It ray on 1 y be specifiedin 3 D viewdiction aries in whi ch both a carara-toworl dratrix (MS an dassoci ateden tri es) an da projection di cti on Rreynf(the $\operatorname{try}$ ) are present.

The CO en try speci fi es the di stan ce fronthe carar a tocenter of orbit for the 3D vi ew whi ch is the poin $t$ aroun d whi ch the carer a shoud rotate when per for min gan orbit-style $n$ avi gtif̈gure 9.4 ill ustrates carar a position in guhen orbitingaroun dthe cen ter of orbit.


FIGURE 9.4 Rotation around thecenter of orbit

The LS en tryallous the lightin gof the 3D ar twor kto be chan ged wi thout chan g ingthe ar thorkitself. Thi sen abl es con surars to viewag ven pi ece of 3D artnork with a vari ety of lightingoption without requiringntiple copi es of the 3D art workstreanthat differ on lyin lighting It al so en ables artworkwi th poor lighting
far pl an es, respecti vel y . A val ANEffor CS rean sthat the n ear an dfar pl an es are determin edatorati cally basedon the objects in the artwork

The Subtype en try speci fies the type of projection, whi ch determn es howobjects are projectedon to the $n$ ear pl an e an $\mathrm{d} s \mathrm{cal}$ ed. The possi ble vabfonothographic projection an dP forperspectiveprojection.

For orthogr aphi c projection, objects are projected on to the n ear pl an e by si pl y di scardingtheizrval u. They are scal edfromn its of the $n$ ear pl an e's coor di n ate systento those of the an $n$ otati otaas get coordi $n$ ate systenby the corbi $n$ edfac tors specified by tlos en $\operatorname{tr} y$ an dth厄⿱ en $\operatorname{try}$.

For per spective projection, agiven coord, y , aze i (s projected on to the n ear

$x_{1}=x \times \frac{n}{z}$
$\mathrm{y}_{1}=\mathrm{y} \times \frac{\mathrm{n}}{\mathrm{z}}$
where n is theZ coor di n ate of the n ear pl an e .
Scal ing uith perspective projection is me complicated than for or thographic projection. TheOV entry specifies an an $g$ e that defin es a con e centered al ong the $Z$ axis in the carera coordin ate system(sEiegre 9.5). The con e intersects wi th the near pl an e , formn gacircu ar area on the n ear Figlgnee 9.6 shous thi scircle andgraphicsfronthe position of the carara.


FIGURE 9.5 Perspectiveprojection of 3D artwork onto thenear plane
+


PLATE 12 Radial shadings depidinga sphere("Type3 (Radial) Shadings", page313)


PLATE 13 Radial shadings with extension ("Type3 (Radial) Shadings," page313)


PLATE 14 Radial shading ffect ("Type3 (Radial) Shadings,", page313)


Ungrouped objects Object opacity $=1.0$


Transparency group Object opacity $=1.0$ Group opacity $=0.5$ Blend mode $=$ Normal


Ungrouped objects Object opacity $=0.5$


Transparency group Object opacity $=0.5$ Group opacity $=1.0$ Blend mode $=$ HardLight

PLATE 16 Transparency groups (Sedion 7.1, "Overview of Transparency," page515)


PLATE 17 Isolated and knodkout groups(Sections 7.3.4, "Isolated Groups," page539 and 7.3.5, "Knockout Groups," page540)


