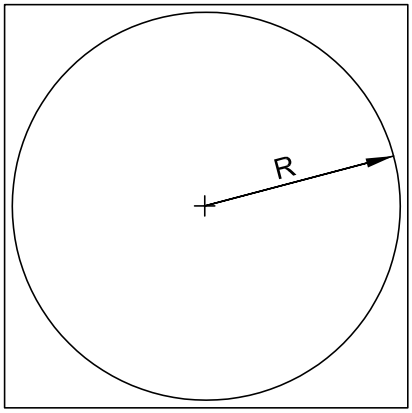
STANDARD ELECTRIC/WATER DRIVE

FORMULAS FOR CALCULATING ACREAGES IN FIELDS AND SEGMENTS ARE SHOWN BELOW:



FULL CIRCLE WITHOUT END GUN

$$\text{Acres} = \frac{R^2 \times {}^{**}\pi}{{}^{*}43{,}560\ \text{ft}^2}$$

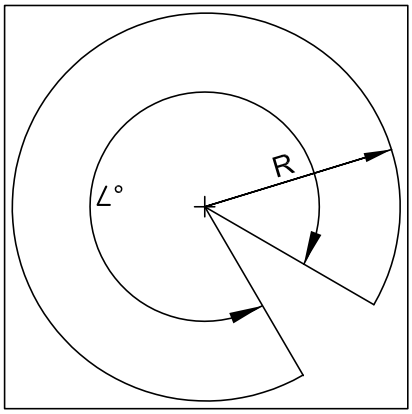
*One (1) Acre = 43,560 ft² **π = 3.1416

$$\text{Acres} = \frac{1{,}294 \times 1{,}294 \times 3.1416}{43{,}560}$$

Acres = 120.8

CLEAR FIELDS

R = Acres = 0.0



PART CIRCLE WITHOUT END GUN

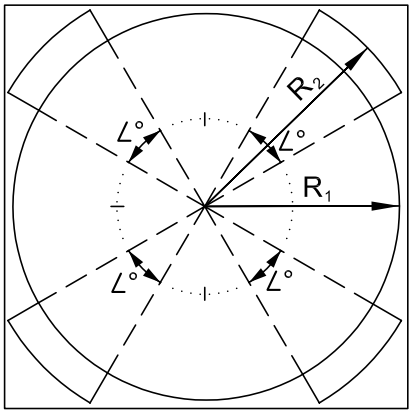
$$\text{Acres} = \left(\frac{R^2 \times \pi}{43{,}560}\right) \times \left(\frac{\angle°}{360°}\right)$$

$$\text{Acres} = \left(\frac{1{,}294 \times 1{,}294 \times 3.1416}{43{,}560}\right) \times \left(\frac{330}{360}\right)$$

Acres = 110.7

CLEAR FIELDS

R = ∠° = Acres = 0.0



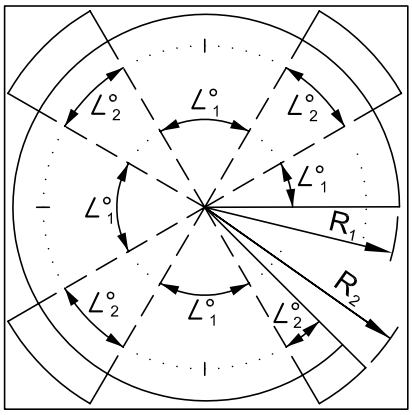
FULL CIRCLE WITH END GUN

$$\text{Acres} = \left[\left(\frac{R_1^2 \times \pi}{43{,}560}\right) \times \left(\frac{360° - \Sigma\angle°}{360°}\right)\right] + \left[\left(\frac{R_2^2 \times \pi}{43{,}560}\right) \times \left(\frac{\Sigma\angle°}{360°}\right)\right]$$

$$\text{Acres} = \left[\left(\frac{1{,}294 \times 1{,}294 \times 3.1416}{43{,}560}\right) \times \left(\frac{240}{360}\right)\right] + \left[\left(\frac{1{,}364 \times 1{,}364 \times 3.1416}{43{,}560}\right) \times \left(\frac{120}{360}\right)\right] = 125.2 \text{ Acres}$$

CLEAR FIELDS

R_1 = R_2 = $\Sigma\angle°$ = Acres = 0.0



PART CIRCLE WITH END GUN

$$\text{Acres} = \left[\left(\frac{R_1^2 \times \pi}{43{,}560}\right) \times \left(\frac{\Sigma\angle°_1}{360°}\right)\right] + \left[\left(\frac{R_2^2 \times \pi}{43{,}560}\right) \times \left(\frac{\Sigma\angle°_2}{360°}\right)\right]$$

$$\text{Acres} = \left[\left(\frac{1{,}294 \times 1{,}294 \times 3.1416}{43{,}560}\right) \times \left(\frac{225}{360}\right)\right] + \left[\left(\frac{1{,}364 \times 1{,}364 \times 3.1416}{43{,}560}\right) \times \left(\frac{110}{360}\right)\right] = 116.5 \text{ Acres}$$

CLEAR FIELDS

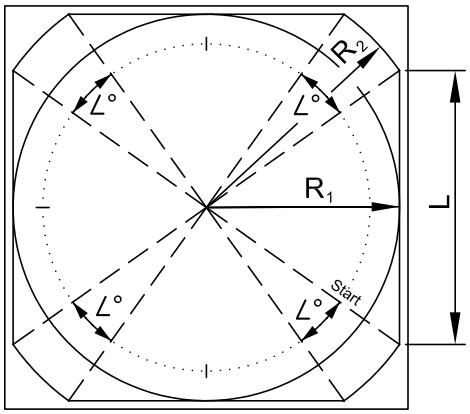
R_1 = R_2 =

$\Sigma\angle°_1$ = $\Sigma\angle°_2$ = Acres = 0.0

CORNER SYSTEMS

FORMULAS FOR CALCULATING ACREAGES IN FIELDS AND SEGMENTS ARE SHOWN BELOW:

FULL CIRCLE - FOUR CORNERS



$$\text{Acres} = \left[\frac{4\left(\frac{R_1 \times L}{2}\right)}{43{,}560}\right] + \left[\left(\frac{R_2^2 \times \pi}{43{,}560}\right) \times \left(\frac{\Sigma\angle^\circ}{360^\circ}\right)\right]$$

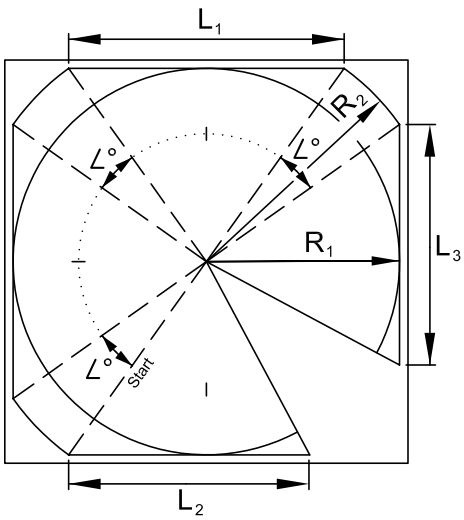
$$\text{Acres} = \left[\frac{4\left(\frac{1{,}268 \times 2{,}100}{2}\right)}{43{,}560}\right] + \left[\left(\frac{1{,}581 \times 1{,}581 \times 3.1416}{43{,}560}\right) \times \left(\frac{56}{360}\right)\right]$$

= 150.3 Acres

CLEAR FIELDS

R_1 = R_2 = L = $\Sigma\angle^\circ$ = Acres = 0.0

PART CIRCLE



$$\text{Acres} = \left[\frac{2\left(\frac{R_1 \times L_1}{2}\right) + \left(\frac{R_1 \times L_2}{2}\right) + \left(\frac{R_1 \times L_3}{2}\right)}{43{,}560}\right] + \left[\left(\frac{R_2^2 \times \pi}{43{,}560}\right) \times \left(\frac{\Sigma\angle^\circ}{360^\circ}\right)\right]$$

$$\text{Acres} = \left[\frac{2\left(\frac{1{,}268 \times 2{,}100}{2}\right) + \left(\frac{1{,}268 \times 1{,}800}{2}\right) + \left(\frac{1{,}268 \times 1{,}900}{2}\right)}{43{,}560}\right] +$$

$$\left[\left(\frac{1{,}581 \times 1{,}581 \times 3.1416}{43{,}560}\right) \times \left(\frac{48}{360}\right)\right] = 139.0 \text{ Acres}$$

R_1 = L_1 = L_2 = L_3 = R_2 = $\Sigma\angle^\circ$ =

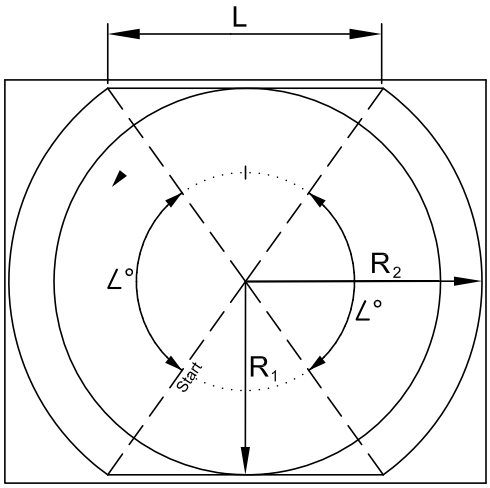
CLEAR FIELDS

Acres = 0.0

CORNER SYSTEMS (cont.)

FORMULAS FOR CALCULATING ACREAGES IN FIELDS AND SEGMENTS ARE SHOWN BELOW:

RECTANGULAR FIELD



$$\text{Acres} = \left[\frac{2\left(\frac{R_1 \times L}{2}\right)}{43{,}560}\right] + \left[\left(\frac{R_2^2 \times \pi}{43{,}560}\right) \times \left(\frac{\Sigma\angle°}{360°}\right)\right]$$

$$\text{Acres} = \left[\frac{2\left(\frac{1{,}268 \times 2{,}050}{2}\right)}{43{,}560}\right] + \left[\left(\frac{1{,}581 \times 1{,}581 \times 3.1416}{43{,}560}\right) \times \left(\frac{220}{360}\right)\right]$$

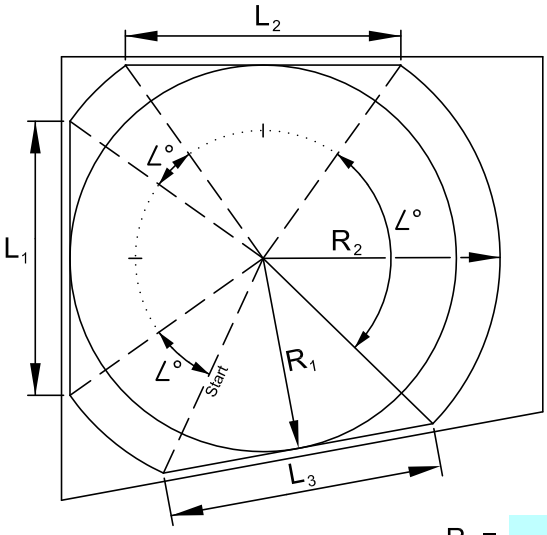
= 146.6 Acres

CLEAR FIELDS

R_1 = R_2 =

L = $\Sigma\angle°$ = Acres = 0.0

ODD SHAPE FIELD



$$\text{Acres} = \left[\frac{\frac{R_1}{2} \times \left(\overset{\text{Add "L" lengths as needed}}{\Sigma\, L_1, L_2, L_3,}\right)}{43{,}560}\right] + \left[\left(\frac{R_2^2 \times \pi}{43{,}560}\right) \times \left(\frac{\Sigma\angle°}{360°}\right)\right]$$

$$\text{Acres} = \left[\frac{\frac{1268}{2} \times (1650 + 1700 + 1600)}{43{,}560}\right] + \left[\left(\frac{1581 \times 1581 \times 3.1416}{43{,}560}\right) \times \left(\frac{133}{360}\right)\right] = 138.6 \text{ Acres}$$

CLEAR FIELDS

R_1 = R_2 =

Σ L = $\Sigma\angle°$ = Acres = 22.6

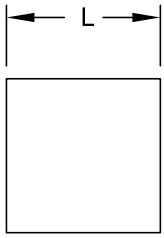
DETERMINING AREA & IRRIGATED ACREAGE

FORMULAS FOR CALCULATING ACREAGES IN FIELDS AND SEGMENTS ARE SHOWN BELOW:

1. Area of a square = L^2
   "L" is the length in feet of one side of the square.

If L = 2640'
L^2 = 2640 x 2640

$$\text{Area} = \frac{6{,}969{,}600\ ft^2}{*43{,}560\ ft^2} = 160 \text{ acres}$$



*One (1) Acre = 43,560 ft^2

$$\text{Acres} = \frac{ft^2}{43{,}560\ ft^2}$$

CLEAR FIELDS

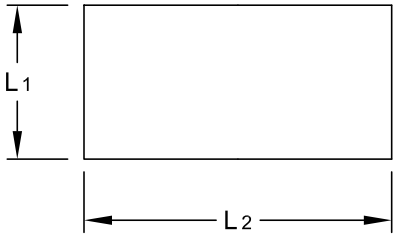
L =

Area (acres)= 0.0

2. Area of a rectangular field. (A)

Area = L_1 x L_2
Area = 2640' x 5280'
= 13,939,200 ft^2

$$\text{Acres} = \frac{13{,}939{,}200\ ft^2}{43{,}560\ ft^2} = 320 \text{ acres}$$

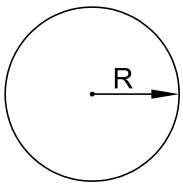


CLEAR FIELDS

L_1 = L_2 =

Area (acres) = 0.0

3. Area of circle



Area = R^2 x π
If R = 1300
A = 1300^2 x 3.14
= 5,309,291 ft^2

$$\text{Acres} = \frac{5{,}309{,}291\ ft^2}{43{,}560\ ft^2} = 121.88 \text{ acres}$$

(π = 3.1416)

CLEAR FIELDS

R =

Area (acres) = 0.0

4. Area of a part circle

$$\text{Area} = (R^2 \times \pi) \times \left(\frac{\angle°}{(360°)}\right)$$

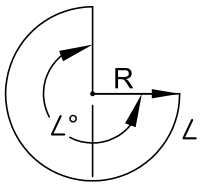
If R = 1300 & ($\angle$=270°)

$$\text{Area} = (1300^2 \times 3.14) \times \left(\frac{270°}{360°}\right)$$

= 3,981,969 ft^2

$$\text{Acres} = \frac{3{,}981{,}969\ ft^2}{43{,}560\ ft^2} = 91.41 \text{ acres}$$

CLEAR FIELDS



R = $\angle$° =

Area (acres) = 0.0

$\angle$° = Number of degrees, measured with a protractor

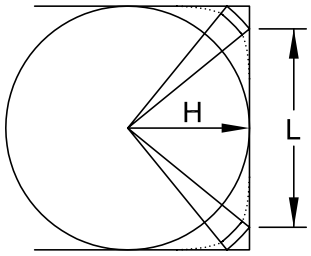
5. Area of triangle

$$\text{Area} = \frac{H \times L}{2}$$

If H = 1300 ft.
& L = 1900 ft.

$$\text{Area} = \frac{(1300)\ (1900)}{2} = 1{,}235{,}000\ ft^2$$

$$\text{Acres} = \frac{1{,}235{,}000\ ft^2}{43{,}560\ ft^2} = 28.4 \text{ acres}$$

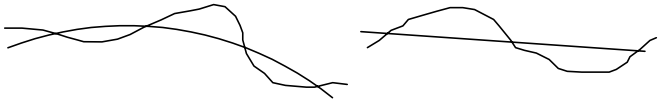


"H" is the same as system length and is equal to the "radius".

"L" is length of the base in the triangle.

CLEAR FIELDS

H = L =

Area (acres) = 0.0

NOTE:
To calculate (estimate) the acreage included in a very irregulary shaped area irrigated by a corner system, draw a straight line or a circular arc that will most nearly provide an "average" boundary.