PROJECT	**UNIVERSAL POLAR STEREOGRAPHIC TRANSFORMATIONS**
	For use of this form, see FM 3-34.331; the proponent agency is TRADOC.

LOCATION	ORGANIZATION

ZONE	UNIT	FALSE NORTHING (FN)	FALSE EASTING (FE)
	Meter	2,000,000 Meters	2,000,000 Meters

STATION		STATION	
Ø		Ø	
λ		λ	
sin λ		cos λ		sin λ		cos λ	
tan λ		cot λ		tan λ		cot λ	
R		R	
N'		E'		N'		E'	
N		E		N		E	

STATION		STATION	
Ø		Ø	
λ		λ	
sin λ		cos λ		sin λ		cos λ	
tan λ		cot λ		tan λ		cot λ	
R		R	
N'		E'		N'		E'	
N		E		N		E	

GEOGRAPHIC COORDINATES TO UPS GRID COORDINATES

NORTH ZONE	SOUTH ZONE
λ less than 90° subtract N' from FN λ greater than 90° add N' to FN λ east, E' plus λ west, E' minus	λ less than 90° add N' to FN λ greater than 90° subtract N' from FN λ east, E' plus λ west, E' minus

$N = FN + N'$ $N' = R \cos \lambda$ $E = FE + E'$ $E' = R \sin \lambda$

UPS GRID COORDINATES TO GEOGRAPHIC COORDINATES

BOTH ZONES

$N' = N - 2{,}000{,}000$ If N' greater than E' use $\tan \lambda = \frac{E'}{N'}$

$E' = E - 2{,}000{,}000$ If E' greater than N' use $\cot \lambda = \frac{N'}{E'}$

NORTH ZONE	SOUTH ZONE
If N less than FN use λ as solved If N greater than FN subtract λ from 180° If E less than FE λ is west	If N less than FN subtract λ from 180° If N greater than FN use λ as solved If E less than FE λ is west

$R = \dfrac{E'}{\sin \lambda}$ Ø by inverse interpolation of R

COMPUTED BY	DATE *(YYYYMMDD)*	CHECKED BY	DATE *(YYYYMMDD)*

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