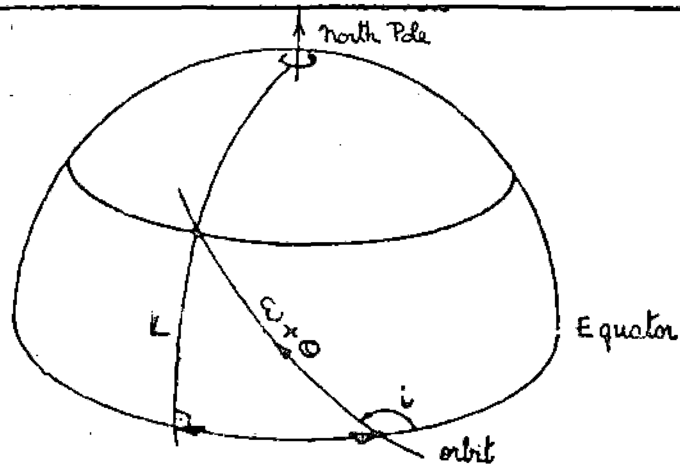

$$\sin(\omega + \theta) = \frac{\sin L}{\sin(180 - i)}$$

$$\sin(\omega_f + \theta_f) = \frac{\sin 5.205}{\sin 80.48}$$

$$= 5.28$$

Since $\omega_f = 0$, $\theta_f = 5.28$

Note that θ_f is measured from perigee of the final orbit to the rendezvous point.

An arbitrary altitude upon which to iterate is then selected for the waiting orbit. Launch vehicle data are used to obtain corresponding time of ascent and ground range. Ariane data are taken from figure 2-4:

h	(km)	400	600	850
t_{ascent}	(sec)	370	500	850
x	(km)	600	1100	2800

For the initial iteration $a_w = 600 + 6378 = 6978$ km is selected. The waiting orbit parameters are then:

$a_w = 6978$ km
$\tau_w = 5801$ sec
$i_w = 99.52^\circ = i_f$
$e_w = 0$

3.3 Predict the Transfer Orbit Parameters

As the transfer is between circular orbits and interception is to occur at tangency, the transfer orbit is Hohmann.
The radius of perigee of the transfer orbit will be equal to the semi-major axis of the circular waiting orbit and the radius of apogee will be equal to the semi-major axis of the circular target orbit. Since the transfer is between circular orbits and the point of rendezvous is at tangency of the transfer and final orbits, then $\theta_t = 180^\circ$ and the time for the transfer will simply be half the transfer orbit period. (For other orbits these parameters would be calculated.)