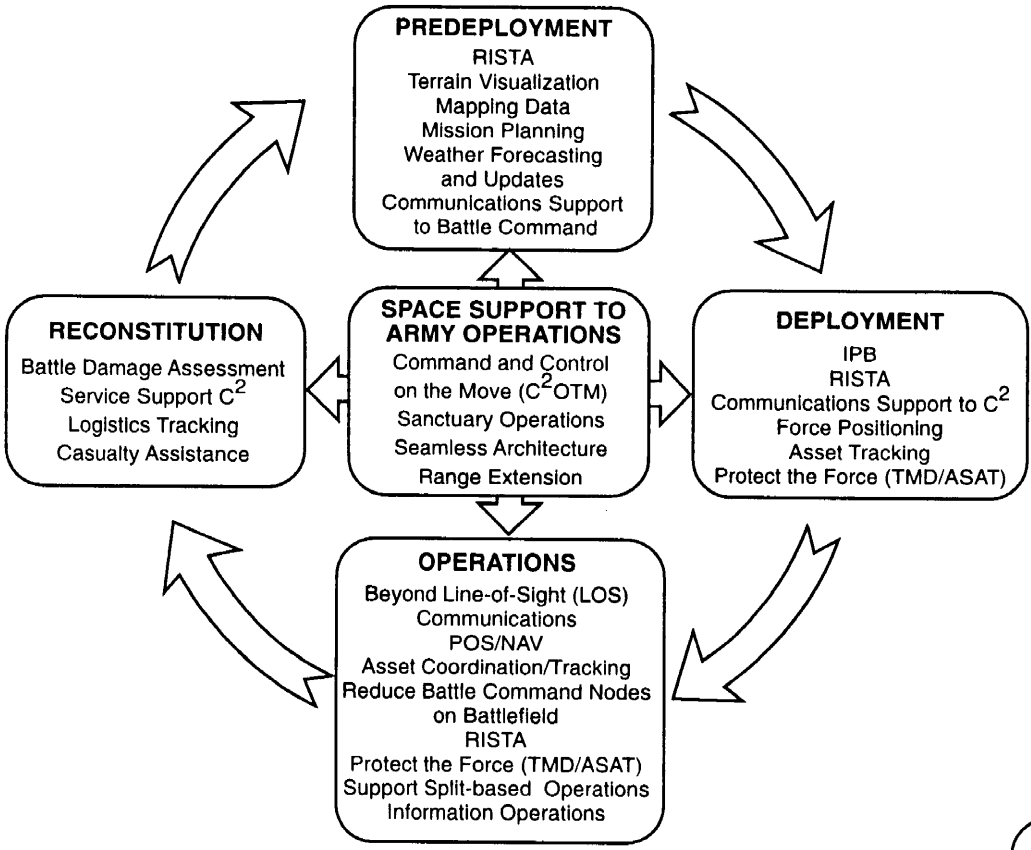

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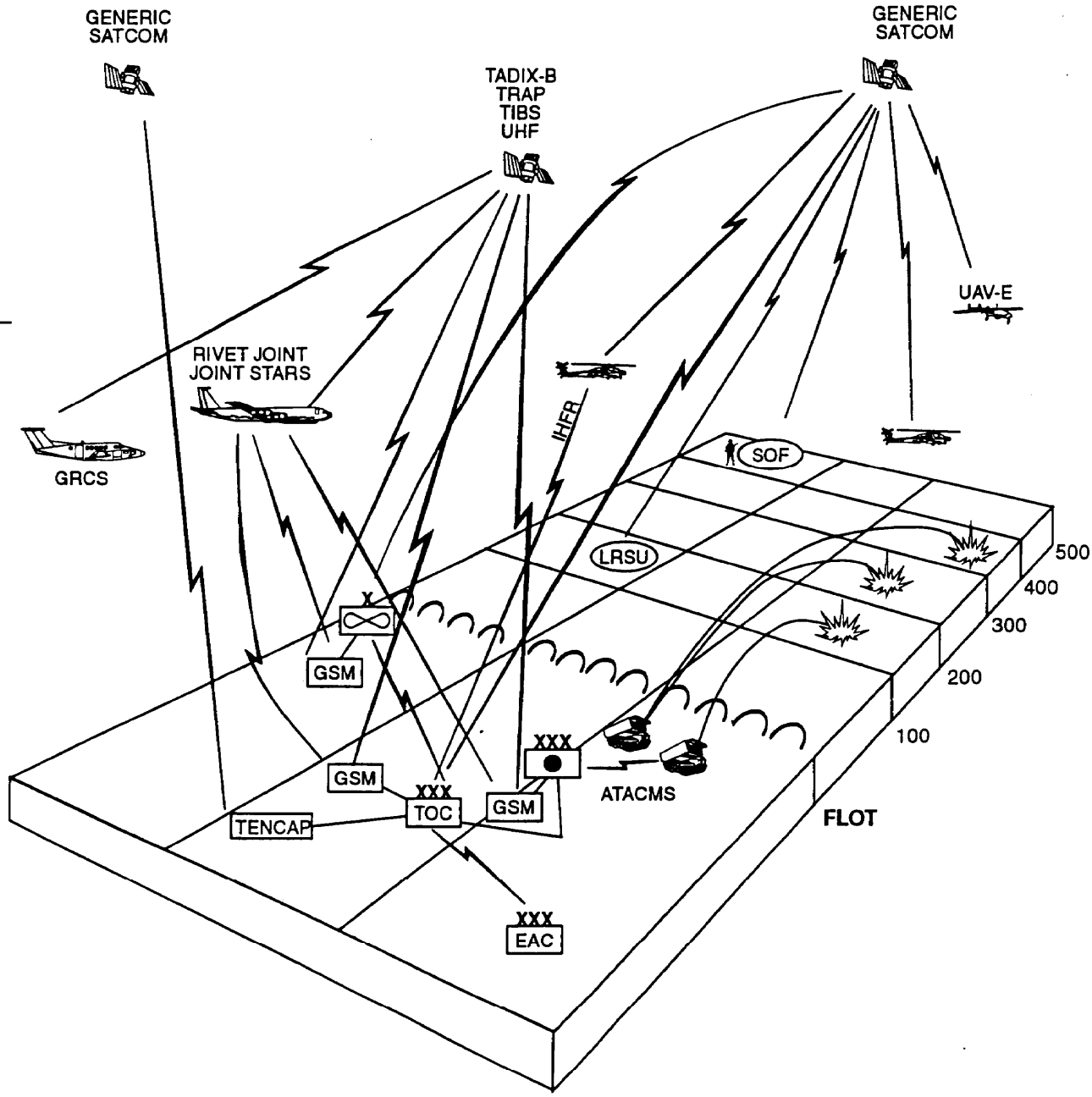

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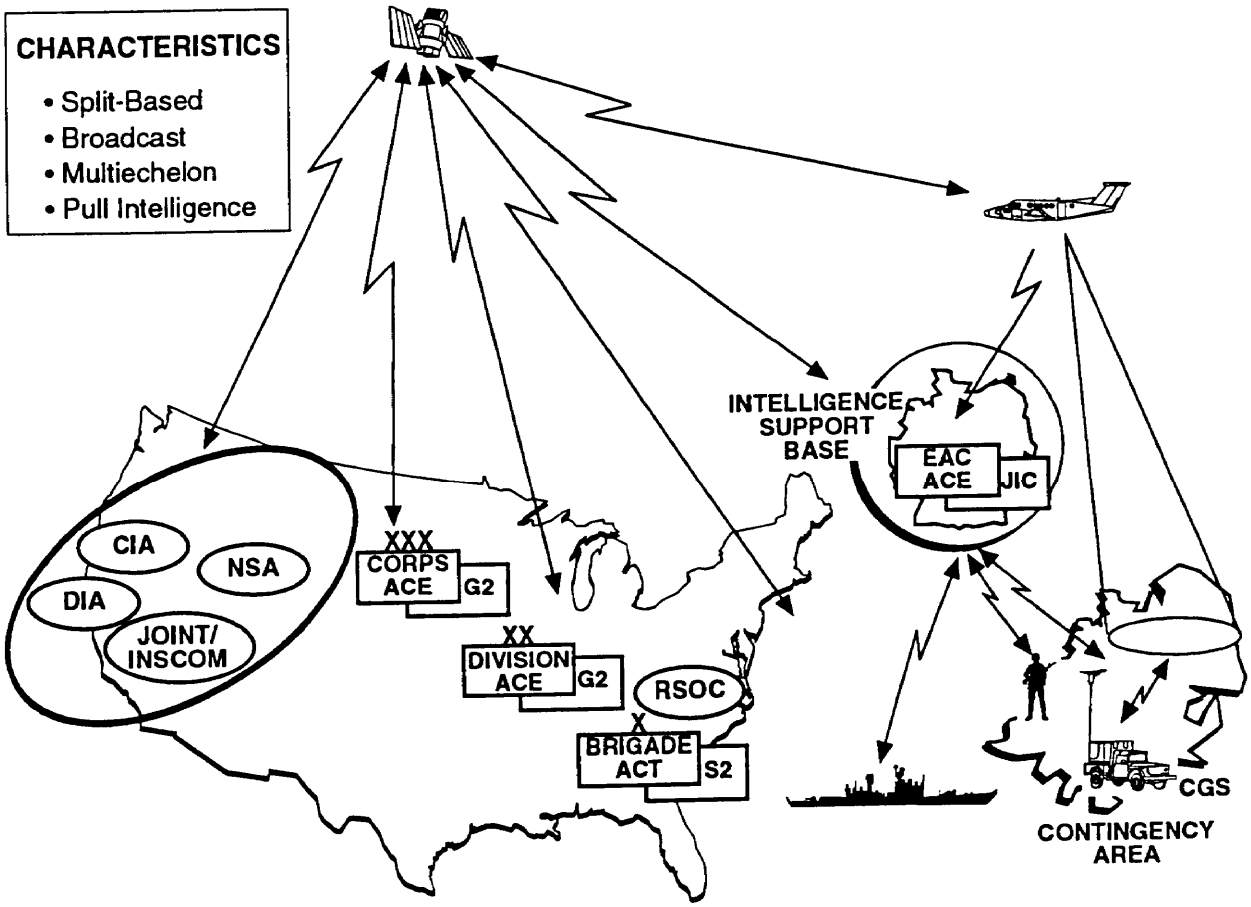

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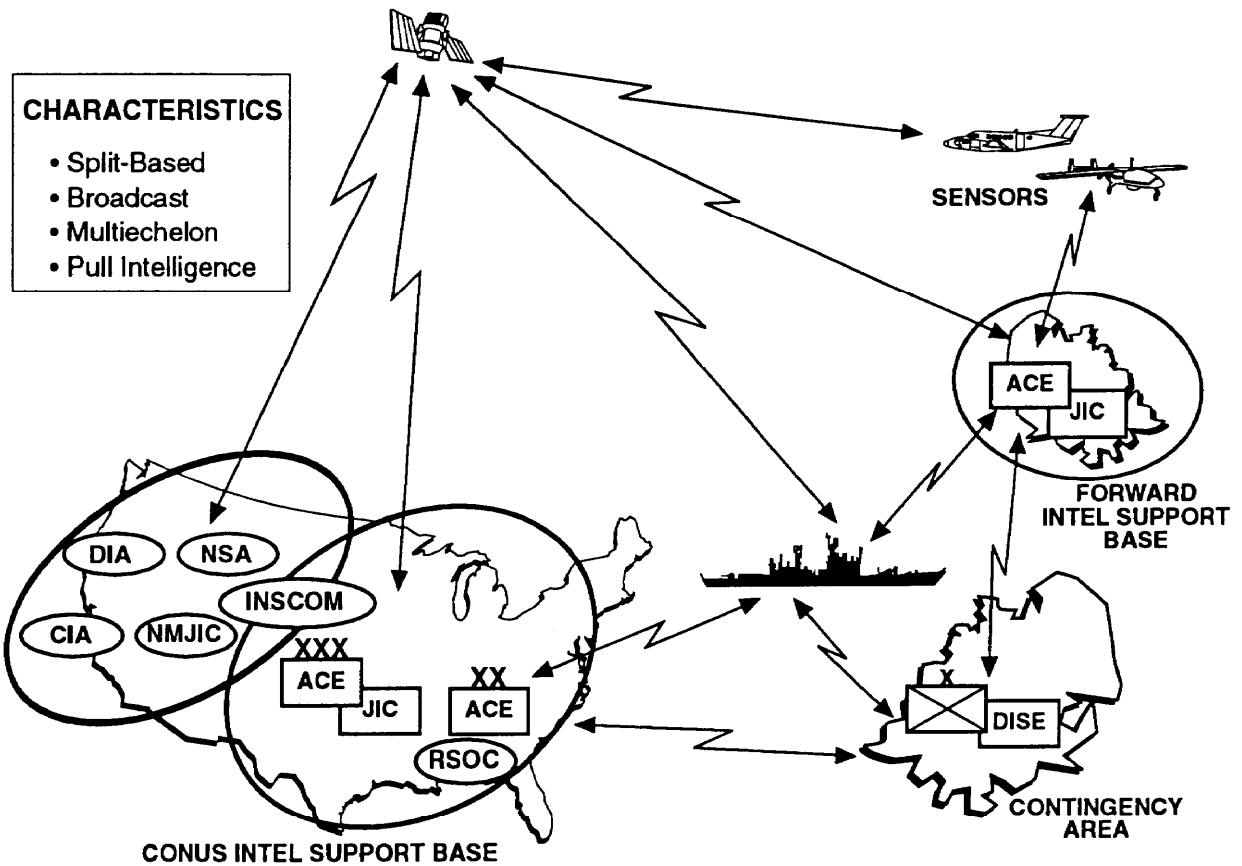

Direct access to
national technical means
and data bases

DISE– Communications +
Automated Intelligence Fusion +
Broadcast Downlink
Seamless through joint/national level

fig 3-4
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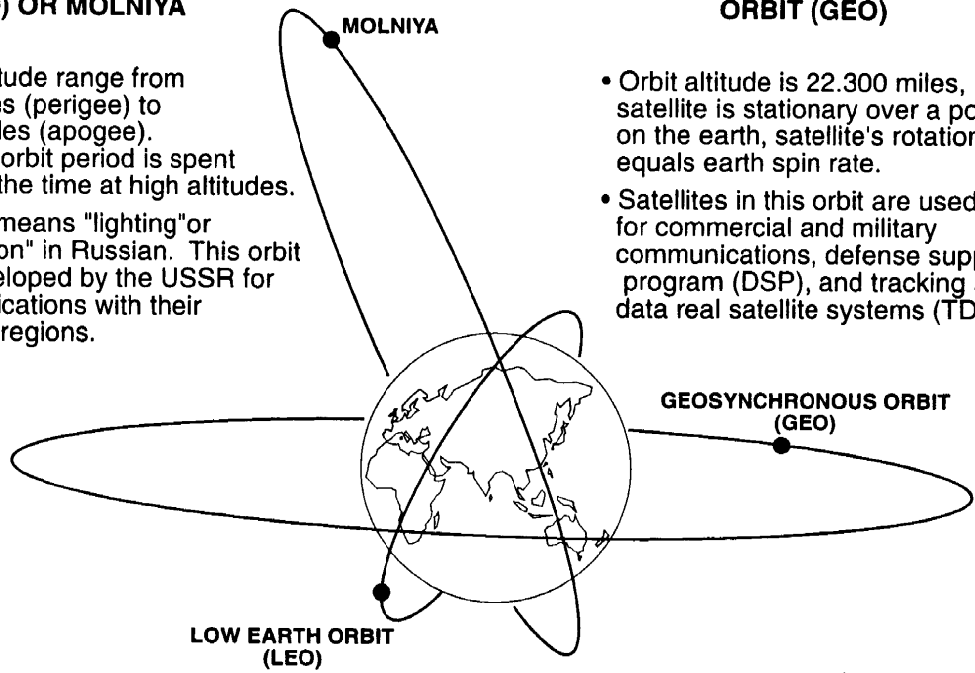
HIGHLY ELLIPTICAL ORBIT (HEO) OR MOLNIYA

- Orbit altitude range from 300 miles (perigee) to 2500 miles (apogee). 12-hour orbit period is spent most of the time at high altitudes.
- Molniya means "lighting"or "first edition" in Russian. This orbit was developed by the USSR for communications with their northern regions.

GEOSYNCHRONOUS EQUATORIAL ORBIT (GEO)

- Orbit altitude is 22.300 miles, satellite is stationary over a point on the earth, satellite's rotation equals earth spin rate.
- Satellites in this orbit are used for commercial and military communications, defense support program (DSP), and tracking and data real satellite systems (TDRSS).



LOW EARTH ORBIT (LEO)

- Orbit altitude is approximately 90-500 miles. The satellite orbit period is approximately 90 minutes and the satellite traces a different path over earth with each orbit.
- Satellites in this orbit are weather, earth resources, space shuttle, space station, space telescope, and gamma-ray observatory.

TYPES OF ORBITS

Circular vs elliptical low-, medium-, or high-altitude inclined, equatorial, polar, geostationary

ISSUES WITH ALTITUDE

- **Coverage, Outage, Revisit Times**
- **Operational Complexity – Acquisition, Pointing**
- **Number of Satellites Required**
- **Path Loss, Antenna Patterns**
- **Sensor Satellites – Resolution**

fig 4-5
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