INTERCONTINENTAL BALLISTIC MISSILE SILOS

MICHAEL FIRMIN and J. DAVID ROGERS
Figure 1. Layout of the missile launch complex.

Plan View of a Typical Titan II ICBM Complex
Oblique photo of a Titan II Complex, as viewed at the ground surface
Control Center

Access Portal &

Blast Lock Area

Silo

Cutaway view of a typical underground Titan II missile complex
Giant springs which served to attenuate harmonic dynamic motions created by missile launching, as seen inside the Titan II Missile Museum in Tucson, AZ
TITAN II ICBM system

- Deactivated in Mid-1980’s

- Capabilities
  - Range: 6000 miles
  - Velocity: 17,000 mph
  - Length: 103 Feet
  - Time to Target: 35 min

- Green Valley, AZ (museum open to public)

- Vandenberg AFB, CA (active test site, not open to public)
Titan I Launch Sequence photographed at Vandenberg AFB, CA in 1961
Launch Control Capsule module under construction at Malstrom AFB, MT in Nov. 1961
Launch Control Capsule module under construction at Ellsworth AFB, SD in July 1962. Note cut-and-cover method being employed.
Close up of Launch Control Capsule under construction at Ellsworth AFB, SD in Sept. 1962
Cut away model of a Minuteman missile launch complex
Construction of Minuteman Launch Silo B-11 at Whiteman AFB, MO on June 18, 1962
Crafting housing for Minuteman launch silo B-11, after the steel casing has been lowered into the neat excavation. At Whiteman AFB, MO in June 1962
Blast Door to Delta I Launch Control Capsule Ellsworth Air Force Base, SD
Minuteman II Missile being loaded into underground silo at Ellsworth Air Force Base, SD
MINUTEMAN III
The Last of its Kind

- Range: 8080 Miles
- Velocity: 15,000 mph
- Length: 60 Feet
- Ceiling: 700 miles
PEACEMAKER

- Range: 6000 miles
- Velocity: 15,000 mph
- Length: 71 Feet
- Warheads: 10 Avco MK21 re-entry vehicles
STRATEGIC ARMS REDUCTION TREATY  
(START I)  

- Signed by US and Soviet Union on 31 JUL 1991  
- Belarus, Kazakhstan, Ukraine and Russia signed on 23 MAY 1992  
- Ratified on 5 DEC 1994  
- Joint reduction to 6000 Deployed warheads reached on 05 DEC 2001
STRATEGIC ARMS REDUCTION TREATY
(START II)

- Signed by US and Russia on 3 JAN 1993
- Ratified on 14 APR 2000
- Interim limitations must be completed by 31 Dec 2004
- All limitations and reductions must be completed by 31 Dec 2007
## START

<table>
<thead>
<tr>
<th>Phase One (Completion Date: 31 December 2004)</th>
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<tr>
<td>• 3,800-4,250 actual Strategic Warheads</td>
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<tr>
<td>• 1,200 MIRVs with ICBMs</td>
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<tr>
<td>• 2,160 Submarine-Launched Ballistic Missiles (SLBMs)</td>
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<td>• 1,600 Strategic Nuclear Delivery Vehicles (SNDVs)</td>
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<th>Phase Two (Completion Date: December 31, 2007)</th>
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<tr>
<td>• 3,000-3,500 actual Strategic Warheads</td>
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<tr>
<td>• Zero MIRVs with ICBMs</td>
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<tr>
<td>• 1,700-1,750 Submarine-Launched Ballistic Missiles (SLBMs)</td>
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Concrete Barriers on exhibit at the Titan II Missile Museum near Tucson, AZ
Disarmed Warhead on inert Titan II Missile at the museum near Tucson, AZ
REFERENCES


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