APPENDIX A
STUDY AREA AND TERRAIN VARIABILITY SUPPORTING DOCUMENTATION

Introduction

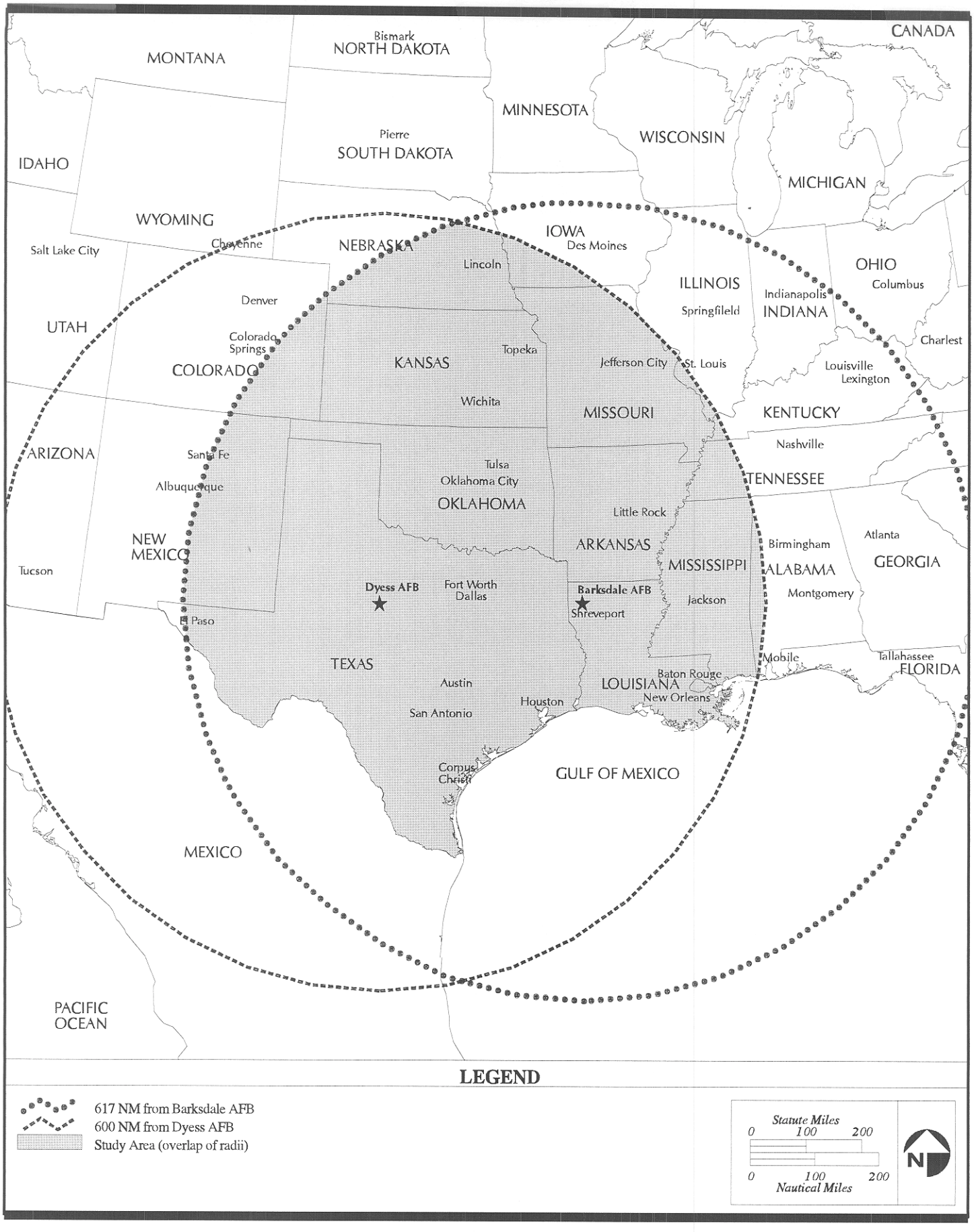
The RBTI study area was defined by creating a circle around Barksdale AFB and a circle around Dyess AFB; each circle has a radius of approximately 600 nautical miles (nm) from Barksdale and Dyess AFBs (Figure A-1). Terrain variability was then identified meeting the criteria defined as necessary for simulating realistic combat conditions. The discussion below explains how the 600 nm radius was derived and the process followed for determining terrain variability.

600 Nautical Mile Determination

The times and airspeeds for outbound and return distances for mission flight events were used to determine the distance from the bases to training assets to meet optimum average sortie duration (ASD) goals. The ASD is calculated using a unit's total number of flying hours divided by the number of sorties that must be flown (see Section 1.3.3 in RBTI EIS for further discussion). Tables A-1 and A-2 show the maximum distance for a B-52 and B-1 flying from the base and returning within the optimum ASD. These distances do not include flight time along a Military Training Route (MTR) since any given route does not necessarily provide either outbound or inbound distance. Nor do these distances include flight time that occurs around the base airfield for take-offs and landings.

Table A-1.
B-52 Maximum Distance - Based on Optimum ASD from Barksdale AFB

Flight Event	*Time (minutes)*	*Airspeed (nm/minute)*	*Distance (nm)*
Departure	15	4	60
En route to IR	45	7	315
Air Refueling	60	6	360
En route to MTR	20	7	140
En route to MOA	20	7	140
MOA	20	7	140
En route to Base	20	4	80
TOTAL	200	NA	1,235
Maximum Outbound or Inbound Distance			617.5



Average Sortie Duration Radii from Barksdale and Dyess AFBs

Figure A-1

Table A-2 **B-1 Maximum Distance–Based on Optimum ASD from Dyess AFB**			
Flight Event	*Time (minutes)*	*Airspeed (nm/minute)*	*Distance (nm)*
Departure	15	4	60
En route to IR	30	7	210
Air Refueling	60	6	360
En route to MTR	20	7	140
En route to MOA	20	7	140
MOA	30	7	210
En route to Base	20	4	80
TOTAL	200	NA	1,200
Maximum Outbound or Inbound Distance			600

Because an aircraft must return to base, training assets should not be located farther than one-half the distance of the aircraft's maximum allotted flight time (i.e., one-half of 1,200 nm equals 600 nm) from a base. Each half of the maximum distance represents the length for the outbound or inbound segment of a sortie. For B-52s, the longest outbound or inbound distance is about 617.5 nm from Barksdale AFB. For B-1s from Dyess AFB, the halfway point of a sortie lies within approximately 600 nm of the base. The overlapping section of the distances from each base accounts for approximately 65 percent of the total area. Since most of the two areas coincide, development of interrelated training assets within the overlapping section would enhance efficiency for the units at both bases. These overlapping areas were used to define the RBTI study area and the area in which the search for alternatives was conducted. Figure A-1 illustrates the area encompassed relative to each base and shows their degree of overlap.

Terrain Variability

Under RBTI, varied terrain differences results in better training opportunities for simulating realistic combat conditions. As mentioned in Section 2.1.1 of the RBTI EIS, the optimal MTR should overlie a minimum of 240 nm of contiguous terrain and offer high to moderate variability. Terrain variability is a combination of both slope and elevation. To identify those areas with terrain variability, a Geographic Information Systems (GIS) modeling program was employed. This GIS model compared the elevation and slope differences for each square mile under a candidate MTR to the elevations of all surrounding square miles.

Classes of elevation differences were assigned to each square mile, on a scale of 1 to 8, with 1 reflecting "low" elevation differences and 8 indicating "high" elevation differences. An identical process was applied to slope differences, where 1 represented the lowest slope differences and 8 showed the highest slope differences. Since elevation and slope both factor into terrain variability, both factors were added together to assign a single measure of terrain variability for each square mile. For example, the lowest measure of terrain variability an area could receive might be 2 (1 for elevation plus 1 for slope); the highest could be 16 (8 for elevation plus 8 for slope).

For purposes of this proposal, lands with a combined total score of 4 or less (elevation and slope differences) represented low terrain variability. Lands under MTRs offering a combined value of greater than 4 but less than 10 comprised moderately variable terrain, and values greater than 10 indicated high terrain variability. Using the GIS model, a search was conducted on all MTRs within the study area to determine the classes of terrain variability. The degree of variability found within

an MTR was then used to assist in alternative MTR selection. All MTRs within the study area with low terrain variability were eliminated from further consideration as potential alternatives. All those exhibiting moderate and/or high variability were further evaluated in the alternative identification process (see EIS, Section 2.1.1).