

CHAPTER 10 - CONCLUSION: ASSETS AND ATTITUDES

For nearly two generations, Army weather support was relegated to second-class status by AWS and by the Air Staff. Many of the problems with supporting the Army were, as two former and very experienced commanders of Army support weather squadrons put it in 1972, directly attributable to the AWS command ethos, which they described as parochial, discriminatory, lethargic, and afflicted with tunnel vision that focused AWS efforts on Army airfields--a microcosm of the total Army mission.¹ According to Colonel Wood, and two of his successors as commander of the 1st Weather Group in Vietnam, it resulted in inadequate support to the Army in combat because Army commanders could not get the type of support they wanted, and did not know how to apply the support AWS was prepared to tender.² By the mid-1970s, amidst a time of peace when the military's avowed goal was readiness for war, it resulted in unsatisfactory weather support, if one believed the Army, "marginally satisfactory" support if one believed what the AWS commander told his boss in 1977.

The hurdles to furnishing satisfactory support to the Army in 1978 were, by and large, the same ones that blocked the path for over thirty years. Problems with over-sophisticated field equipment, tactical communications, logistical support, etc., were anything but novelties. Coincidentally, neither were the weather "enclaves" General Rowe referred to within the Army which, while protecting special interests, were stumbling blocks to unified Army policy; or were Army field commanders with too little consciousness of how to convert weather support into a "force multiplier." Neither were Air Staff agencies that mistrusted Army and AWS motives. Neither were ill-trained AWS officers, indifferent about Army support assignments (with apologies here to a very dedicated minority), aware of careers that had so suffocated, and knowing that no one who became "brushed with brown" by wearing khaki and eating C-rations in the trenches with the troops had ever occupied desks in the aerie of the Headquarters AWS command section. Some officers questioned AWS authorities about promotion passovers only to discover that, while the jump wings they wore were impressive, tours at the crossroads of AWS on Offutt or Scott AFBs were more beneficial than tours at Fort Bragg or Fort Campbell.

Generally, they were the same weathermen who helped make the system work in the field, in spite of itself, thereby forming a dichotomy of attitudes in AWS. Scores of post-mortem reports before, and scores of reports from exercises afterward (as well as Vietnam), echoed the words from the Swift Strike III maneuver of 1963 that it was the weathermen's "dogged determination" that held the weather support structure together. They hauled their own teletypes and facsimile machines to the field when the Army would not, or could not, furnish them; and when AFCS would not, or could not, do it for them, they tore Kleinschmidts apart by the light from kerosene lanterns in tents at night in order to get them back in working order for the

next morning's operation. Young AWS unit commanders--the lieutenants, the captains, the majors--and their talented enlisted men, jury-rigged a system in the foxholes and made it work year after year, despite doctrinal disagreements at high-level echelons, because of a basic trait in the psychological composition of educated and energetic AWS weathermen: there was a job to do, a boss to serve, and be it a SAC wing or a battalion commander, the AWS unit commander would do it with or without sufficient assets. The grades on his report card depended to a great degree on whether or not he satisfied the tactical commander in the field. That was the motivation for such ambition. And it was human nature that he would do his best in that regard, whether or not he had enough equipment or men. That attitude confronted General Best when AWS was undergoing serious manpower cuts in the early 1970s, and he cautioned his superiors that AWS' customers would complain about degraded service. To make it stick, because he knew what attitude most of his detachment commanders would assume, Best told them he did not want to see them or their men in the weather station between 2200 and 0600 hours if local tactical operations were shut down for those hours. And Best instructed his inspector general, who happened to be Rowe at the time, to look specifically for indications of customer dissatisfaction. But, by and large, with each inspection trip to the field, Rowe came back with reports that the customers were not complaining. Rowe found nothing because AWS detachment commanders tightened their belts to satisfy the customers. Local Army commanders in particular profited by that attitude because, even though they were not fully supporting their weathermen, even though there were not enough weathermen, the weather unit commander somehow managed to shore up the shaky system enough to please them. Rowe alluded to the fact that the gung ho attitude among his young detachment commanders would be his "biggest problem" in making stick his ukase that there would be no weathermen forward of the corps on the battlefield.

People in Army weather support came and went, but bedrock attitudes lingered. So did the problems, because the attitudes went a long way toward explaining them. And if such psychobiology explained the perpetuity of problems, it also presaged their continued long life because human nature would not vary, and underlying attitudes had not changed much through 1978--notwithstanding discernible ripples on the surface when a tsunami was needed. The problems were concrete, the attitudes abstractions; but until the abstractions were successfully dealt with--and mere papal writs would not absolve them--the problems would go unresolved.

If attitudes went far toward explaining why the same basic problems in Army weather support went unresolved year after year, the "bottom line," to borrow from contemporary idiom, was assets--money, materiel, and men. The assistant deputy chief of staff for operations at Headquarters AWS expressed it best when he concluded in 1976 that progress and cooperation between the Army and Air Force (AWS) in solving those problems "stops when resources are needed." After the heat from combat dissipated, after the dust rose and fell from each year's maneuvers, and after kernels of wisdom were culled from countless studies through the years, it all boiled down to a question of coming up with the wherewithal. Admonitions to be more specific as to requirements were a stratagem AWS and the Air Staff used to screen their inability or unwillingness to fulfill the Army's needs--the evidence being penurious measures each time the Army responded.

Brigadier General Rowe's "sleeping giant" reawoke, not awoke; and it was not in 1975 or 1977, but with the gunfire of Vietnam. As the 1970s dawned, the giant's appetite grew, even amid cries for "peace dividends" by solons bent on rearranging America's social priorities. Rowe helped enact the loopholes through which AWS teased the giant's tastebuds at a time when the Air Staff and MAC were tightening their grip on AWS. Brigadier General Best warned the Air Staff "bean counters," as he referred to them, that trimming AWS would result in customers being unable to digest the degraded service that would result from fewer beans. Rowe, himself, while with AF/PRW in 1971, helped the "bean counters" set the quota for the largest single-year, Air Staff-imposed cut in AWS since post-World War II.³ By 1977 the carousel had swung full circle and Rowe was the one confronting Best's prophecy come true: the giant was unsatisfied. He wanted more.

By 1977 Brigadier General Rowe felt compelled to react. After seven years of effort, the Army had a comprehensive study, TESS, which concluded that weather support was unsatisfactory and contained a compilation of its specific requirements. It also had a plan, MAP/SAMSR, for overcoming the shortcomings and satisfying its requirements. And it also had a compromise rewrite ready for publication that would bring the bible on Army weather support doctrine up to date. The ball was in Rowe's court. He elected to spurn TESS, spike MAP/SAMSR, and scrap the rewrite in favor of sweeping his men from the battlefield and relying on AWDS at corps.

A major drawback with relying on AWDS in 1977 was that it was a *concept* for the future, as the 5th Weather Wing pointed out, and not something one could apply in the contemporary world to the root causes of unsatisfactory support--attitudes and assets. Granted, the Air Staff approved the concept in November 1977. But it had taken years to reach that plateau (the Air Staff had sent back the basic document for reaccomplishment a couple of times on technicalities), and it was lukewarm to any weather program with a \$64 million price tag. So, while the Air Staff had bestowed conceptual approval, it had not earmarked any money for AWDS.

AWDS faced continued tough sledding on the Air Staff. For one thing, AF/PRW believed AWS was diminishing its combat capabilities by going too far too fast with automation and centralization--an ambivalent stance because, at the same time, it was withholding from AWS the extra manpower it would take to meet the Army's growing requirements without resorting to automation and centralization. AWDS was also sophisticated gear, and history suggested it would be a handicap in supporting tactical Army forces.

Then too, AWS was a long way from proving that AFGWC had a role in tactical Army support. Experience with Reforger 76, 77, and 78 demonstrated that use of AFGWC-generated probability forecasts were hardly the "turning point" in AWS history of centralized support to tactical Army operations as they were characterized by Brigadier General Rowe. High speed communication links to high-capacity computers at AFGWC, in the bowels of the North American continent, made for a peacetime weather service rivaling the National Weather Service in stature. But AF/PRW's root concern was whether AFGWC's products would be available or of much help to airmen and soldiers on battlefields across the oceans. Like AF/PRW, and many senior officers in AWS, the Army wanted to know what happened when the umbilical cord to AFGWC was severed? Could the "advanced weathermen" manning the corps AWDS go it alone?

Were there any solutions to the problems of assets and attitudes? With regard to the former, probably not. Short of war, and with inflation, defense budgets would always be tight. As part of the Air Force's "tail," AWS would be given barely enough to subsist. The "teeth," the first team tactical and strategic forces, would obviously be seen to first. Caught in logic's crossfire between the immovable wall (the Air Staff's refusal to either allocate more assets or abrogate the mission) and the irresistible object (expanding Army requirements), AWS had no choice but to walk a tight-rope between what it wanted to do, by way of supporting the Army, and what it could do with the assets at hand.

Neither could AWS solve the attitude problem with the Army. It could, however, redress its own. It would seem that it could foster a hard core of officers and enlisted weathermen who would spend most of their careers in Army weather support.

Admittedly, many details would have to be worked out that are beyond the purview of this work. The infrastructure exists. But a course should be charted in the Army weather support specialty for young officers, portraying normal career progression that is competitive with their peers supporting Air Force units to the point where it could conceivably culminate as the O-7 commander of AWS. Only then would bedrock attitudes in AWS change for the better, top to bottom.

There appears to be no overriding reason for not so doing. Experts in Army weather support need no longer feel or be treated like step-children in the AWS "family." Morale would improve because attitudes would change. And weather support to the Army would no longer be characterized as second class, or unsatisfactory, or "marginally satisfactory."

Footnotes

CHAPTER 1 - PRE VIETNAM

¹"History of the Air Weather Service," Jan-Jun52 (S), pp. 273-83. Info used (U).

²*Ibid.*

³AWS Historical Study #4, *History of Weather Support to the United States Army*, Dec58, included as Chap X to "History of the Air Weather Service," Jul-Dec58 (S). Info used (U).

⁴See: Section IV, "Agreements on Organization, Mobilization and Training Functions," p. 13, of "Army - Air Force Agreements as to the Initial Implementation of the National Security Act of 1947," 15Sep47; and memo and atch--memorandum of agreements, Maj Gen Earle E. Partridge (Asst Ch of Air Staff-3) and Lt Gen C. P. Hall (Director of Org and Training, Dept of Army), "Agreement on Air and Army Positions for Separation of Air Force and Army," 16Sep47--Lt Gen J. Lawton Collins, Dep Ch of Staff, War Dept, to Directors of War Dept General Staff Divs, *et al.*, "Separation of the Air Force from the U.S. Army," 16Sep47--included as Sup Doc #1 in Vol II, "Supporting Documents," of this study.

⁵AWS Historical Study #4, *History of Weather Support to the United States Army*, Dec58.

⁶See AFM 105-6, *Weather Service for Military Agencies*, 20Dec56, included as Sup Doc F in "History of the Air Weather Service," Jan-Jun57, (S). Info used (U).

The doctrine of AFM 105-6 formed the basis for a manual published by the 2d Weather Group in August 1957, entitled *Weather Support to Tactical Forces*, a copy of which is on file in the AWS historical archives.

⁷AWSR 55-56, "Operations: Weather Service for Army Units," 15Oct57, included as Sup Doc #26 in Vol II, "Documents," of "History of Air Weather Service," Jul-Dec58 (S). Info used (U). The Oct57 version of AWSR 55-56 was superseded by updated version of 16Oct59 which is on file in the AWS historical archives.

⁸AWS Historical Study #4, *History of Weather Support to the United States Army* Dec58, pp. 280-82.

⁹*Ibid.*, pp. 364, 385-89.

¹⁰*Ibid.*

¹¹See, for example, ltr Col T. J. Marnane, Adjutant General, USCONARC (ATINT 413.6/61), to All ZI Armies, *et al.*, "Meteorological Requirements of the US Army," 2Jun59, on file in AWS historical archives.

¹²AWS Historical Study #4, *History of Weather Support to the United States Army*, Dec58, pp. 363, 367-77.

¹³*Ibid.*, and "History of the Air Weather Service," Jan-Jun59 (S), pp. 3-9. Info used (U).

¹⁴See CONARC Reg 115-1, "Hydrological and Meteorological Services: Air Weather Service Support for the Army Within CONUS," 1Mar61, on file in the AWS historical archives.

¹⁵AR 115-10/AFR 105-3, "Hydrological and Meteorological Services: Meteorological Support for the U.S. Army," 23Mar62, pp. 1-2, included as Sup Doc #2 in Vol II, "Supporting Documents," of this study.

¹⁶*Ibid.*, 11.

¹⁷*Ibid.*, 4-5.

¹⁸*Ibid.*, 5-6.

¹⁹*Ibid.*, 4-5

²⁰Change 1 to AR 115-10/AFR 105-3, 19May65, included as Sup Doc #3 in Vol II, "Supporting Documents," of this study.

²¹See AFM 2-31, *Aerospace Operational Doctrine: Aerospace Environmental Operations*, 17Dec65, pp. 11-12, included as Sup Doc #5 in Vol II, "Supporting Documents," of "History of Air Weather Service," 1Jul64-30Jun65 (S). Info used (U).

²²Lt Col Herbert J. Kay (Army Artillery), Chief Evaluator, "Report of Troops Test Evaluation of Air Weather Service Organization in Support of the Army at Corps and Division Level," Project No. USA CDCAVNA 64T1, 30Aug63, p. 5, available in the AWS historical archives.

²³*Ibid.*, 9-10.

CHAPTER 2 - THE TET OFFENSIVE - 1968

¹Fuller and Maj Allan B. Milloy, Vol I, *Narrative*, (S), pp. 40-42, 457, of *The Air Weather Service in Southeast Asia* (Scott AFB IL: HQ Air Weather Service, 15Nov68). Info used (U).

²*Ibid.*, 458-59.

³*Ibid.*

⁴*Ibid.*, 460.

⁵*Ibid.*, 411-12.

⁶*Ibid.*, 443-44.

⁷*Ibid.*, 389-94, 443-44.

⁸Ltr Fuller to MAC (XOZT), "Historical Spt for Analysis of AWS Wartime Reqmts," 18May77.

⁹Fuller and Milloy, Vol I, *Narrative*, (S), pp. 250-54, 259-60, of *The Air Weather Service in Southeast Asia*, 15Nov68. Info used (U).

¹⁰Ltr Col Arthur W. Anderson, AWS ch of stf, to MET-1, "US Army Requirement for Direct Weather Service," 26Mar68.

¹¹"History of the 30th Weather Squadron," Jan-Jun66, p. 14, included as Appendix 2 to "History of the 1st Weather Wing," Jan-Jun66.

¹²*Ibid.*, pp. 16-18. See also A/2C Henry C. Jackson, "Vietnam Detachment Gives Tactical Support to Airmobile Division," *Observer* (Jun66), p. 5; SSgt Steward Diamond, "Two-Man Detachment Backs Combat Pilots," *Observer* (Feb66), p. 3; and "Vietnam Service Earns Medals for Captain Hill," *Observer* (Jan67), p. 5.

- 13 Lt Gen Bernard William Rogers, U.S. Army, *Cedar Falls-Junction City: A Turning Point*, from *Vietnam Studies* (Wash DC: Dept of the Army, 1974), p. 83.
- 14 Fuller and Milloy, Vol I, *Narrative*, (S), pp. 468-69, of *The Air Weather Service in Southeast Asia*, 15Nov68. Info used (U). See also "History of the 1st Weather Group," Jul-Dec66, pp. 13-14, 40-43, included as Appendix 1 to "History of the 1st Weather Wing," Jul-Dec66.
- 15 U.S., Congress, House, Committee on Armed Services, *Hearings on Military Posture . . .*, 91st Cong, 1st Sess, Pt 2, 1969, pp. 3,857-58.
- 16 Lt Gen Willard Pearson, U.S. Army, *The War in the Northern Provinces: 1966-1968*, from *Vietnam Studies* (Wash, DC: Dept of the Army, 1975), pp. 37-39; Lt Gen John J. Tolson, U.S. Army, *Airmobility: 1961-1971*, from *Vietnam Studies* (Wash, DC: Dept of the Army, 1973), p. 158; Gen William C. Westmoreland, "Report on Operations in South Vietnam, January 1964-June 1968," in *Report on the War in Vietnam* (Wash, DC: US Govt Printing Office, 1969), pp. 157-58; and Gen William C. Westmoreland, *A Soldier Reports* (Garden City, NY: Doubleday & Co, 1976), pp. 377-99.
- 17 Pearson, *The War in the Northern Provinces: 1966-1968*, pp. 39-42; Tolson, *Airmobility: 1961-1971*, pp. 162-63; Westmoreland, "Report on Operations in South Vietnam, January 1964-June 1968," pp. 159-60; and Westmoreland, *A Soldier Reports*, p. 400-01.
- 18 *Ibid.*
- 19 Pearson, *The War in the Northern Provinces: 1966-1968*, p. 43.
- 20 Tolson, *Airmobility: 1961-1971*, p. 163.
- 21 Pearson, *The War in the Northern Provinces: 1966-1968*, pp. 47-48; Westmoreland, "Report on Operations in South Vietnam, January 1964-June 1968," p. 160; and Westmoreland, *A Soldier Reports*, p. 402.
- 22 Brig Gen Edwin H. Simmons, USMC Ret, "Marine Corps Operations in Vietnam, 1968," in *The Marines in Vietnam, 1954 - 1973: An Anthology and Annotated Bibliography* (Wash, DC: History and Museums Div, HQ U.S. Marine Corps, 1974), p. 101.
- 23 U.S., Congress, House, Subcommittee on Dept of Defense of the Committee on Appropriations, *Hearings, Department of Defense Appropriations for 1969*, 90th Cong, 2d Sess, Pt 1, 1968, p. 55. See also Westmoreland, *A Soldier Reports*, pp. 407-08.
- 24 Westmoreland, "Report on Operations in South Vietnam, January 1964-June 1968," pp. 162-63.
- 25 Westmoreland, *A Soldier Reports*, p. 410.
- 26 Maj Gen Burl W. McLaughlin, USAF, "Khe Sanh: Keeping an Outpost Alive," *Air University Review*, Vol XX, No 1 (Nov-Dec68), pp. 57-77.
- 27 U.S., Congress, House, Subcommittee on Dept of Defense of the Committee on Appropriations, *Hearings, Department of Defense Appropriations for 1969*, 90th Cong, 2d Sess, Pt 4, 1968, pp. 1,006-07.

²⁸ Capt Moyers S. Shore, II, USMC, *The Battle for Khe Sanh* (Wash DC: Historical Br, G-3 Div, HQ U.S. Marine Corps, 1969), pp. 72-74.

²⁹ *Ibid.*; Pearson, *The War in the Northern Provinces: 1966-1968*, p. 77.

³⁰ Shore, *The Battle for Khe Sanh*, pp. 72-74; U.S. Congress, House, Subcommittee on Dept of Defense of the Committee on Appropriations, *Hearings, Department of Defense Appropriations for 1969*, 90th Cong, 2d Sess, Pt 4, 1968, pp. 1,006-07.

The latter source indicated that during the 73-day siege at Khe Sanh, Air Force aircraft expended nearly 750,000 rounds of ammunition and dropped more than 72,000 tons of bombs--12,500 tons from tactical fighter-bomber aircraft and 59,500 tons from B-52s. Air Force tactical aircraft flew a total of 9,691 sorties and B-52s contributed 2,548 sorties. Coupled with 1,398 Air Force reconnaissance and 1,598 Air Force FAC (Forward Air Controller) sorties, total strike and strike supporting sorties amounted to 27,650, including 5,337 Navy and 7,078 Marine sorties.

For official unclassified Air Force accounts of that, the greatest sustained concentration of air power in Vietnam to that time, see: Bernard C. Nalty, *Air Power and the Fight for Khe Sanh* (Wash DC: Office of Air Force History, HQ USAF, 1973); Jack S. Ballard, et al., *The United States Air Force in Southeast Asia, 1961-1973: An Illustrated Account*, ed. Carl Berger (Wash DC: Office of Air Force History, HQ USAF, 1977); and Gen William W. Momyer, USAF Ret, *Air Power in Three Wars* (Wash DC: Office of Air Force History, HQ USAF, 1978).

Aviation Week & Space Technology (Cecil Brownlow, "B-52s Prove Tactical Value During Siege of Khe Sanh," 13May68, pp. 26-30) noted that the combined ordnance dropped by Air Force, Navy, and Marine aircraft at Khe Sanh was approximately one-sixth of all that expended by the Air Force during three years of the Korean War. *Time* magazine ("How the Battle for Khe Sanh was Won," 19Apr68, pp. 30-32), noting that "U.S. airmen encased the besieged fortress in a virtual curtain of falling bombs," presumptuously labeled Khe Sanh as "a landmark in the use of airpower in warfare--the first time that aerial bombardment has denied an attacker the ability to assault his target."

³¹ Westmoreland, *A Soldier Reports*, p. 421.

³² Tolson, *Airmobility: 1961-1971*, p. 174.

³³ *Ibid.*, pp. 179-80.

³⁴ Nalty, *Air Power and the Fight for Khe Sanh*, pp. 100, 103; and Westmoreland, *A Soldier Reports*, p. 422.

³⁵ Westmoreland, *A Soldier Reports*, p. 423.

³⁶ *Ibid.*, p. 422; Tolson, *Airmobility: 1961-1971*, pp. 178, 182; Pearson, *The War in the Northern Provinces: 1961-1968*, p. 89; and Westmoreland, "Report on Operations in South Vietnam, January 1964 - June 1968," p. 165.

³⁷ Telephone interview by author on 2Aug79 with Lt Gen Tolson, U.S. Army, retired.

³⁸ Tolson, *Airmobility: 1961-1971*, pp. 183-85.

³⁹ *Ibid.*, p. 186.

⁴⁰ *Ibid.* pp. 186-87.

- ⁴¹*Ibid.*, p. 188.
- ⁴²*Ibid.*, pp. 19-91.
- ⁴³*Ibid.*; and Pearson, *The War in the Northern Provinces: 1961 - 1968*, p. 92.
- ⁴⁴Westmoreland, "Report on Operations in South Vietnam, January 1964 - June 1968," p. 288.
It was interesting that, while the accounts published by Generals Westmoreland, Pearson, and Tolson were liberally sprinkled with enemy casualty figures, they rarely contained statistics on American casualties.
- ⁴⁵Tolson, *Airmobility: 1961 - 1971*, p. 191. No helicopters were lost during operation Pegasus.
- ⁴⁶Interview by author on 6Jun74 with Lt Col (colonel-select) Peter N. Micale; telephone interview by author on 25Jun79 with Col Micale.
- ⁴⁷Tolson, *Airmobility: 1961 - 1971*, pp. 191-92.
- ⁴⁸Westmoreland, *A Soldier Reports*, p. 424.
- ⁴⁹Pearson, *The War in the Northern Provinces: 1961 - 1968*, p. 101.
- ⁵⁰Westmoreland, *A Soldier Reports*, p. 403.
- ⁵¹Westmoreland, "Report on Operations in South Vietnam, January 1964 - June 1968," pp. 161, 168, and 190-91.
- ⁵²Johnson, *The Vantage Point: Perspectives of the Presidency, 1963-1969* (New York: Holt, Rinehart and Winston, 1971), pp. 382-83.
- ⁵³Westmoreland, *A Soldier Reports*, p. 406.
- ⁵⁴Samuel Eliot Morison, Henry Steele Commager, and William E. Leuchtenburg, *A Concise History of the American Republic* (New York: Oxford University Press, 1977), pp. 734-38.
- ⁵⁵Johnson, *The Vantage Point*, pp. 365-424.
- ⁵⁶Memo Fuller to Mr. Charles W. Dickens, MAC historian, "'Tactical Airlift in SEA' Draft," 30Sep75; interview by author on 12May75 with Col Edwin E. Carmell, vice comdr, AWS (who was 1st Weather Group vice commander from 1Mar to 21Jul67, after which he commanded the group until 14Jan68); and telephone interview by author on 28Jun79 with Col Juri Nou, 1WS, MacDill AFB, FL (who was the 1st Weather Group's scientific services officer during the Tet offensive).
- ⁵⁷Vol II, "U.S. Ground Strategy and Force Deployments: 1965-1967," Bk 5 of 12 books of *United States - Vietnam Relations, 1945-1967: Study Prepared by the Department of Defense* (Wash DC: U.S. Government Printing Office, 1971), pp. 50-51 (these books were one version of the so-called *Pentagon Papers*); U.S., Congress, Senate, Subcommittee on Oceans and International Environment of the Committee on Foreign Relations, *Hearings: Weather Modification*, 93d Cong, 2d Sess, 1974, pp. 88-89. The latter document is hereinafter cited as *Senate Weather Modification Hearings, 1974*.

⁵⁸ Interview by author on 12May75 with Col Carmell; *Senate Weather Modification Hearings*, 1974, pp. 92-103.

⁵⁹ *Ibid.*

⁶⁰ Westmoreland, *A Soldier Reports*, p. 342. See also Ted Szulc, *The Illusion of Peace: Foreign Policy in the Nixon Years* (New York: The Viking Press, 1978), p. 39.

⁶¹ *Senate Weather Modification Hearings*, 1974, pp. 108-16.

⁶² Only four members of Congress knew: the chairmen of the House and Senate Armed Services and Appropriations committees.

⁶³ Interview by author on 12May75 with Carmell.

⁶⁴ Telephone interview by author on 2Aug79 with Tolson.

⁶⁵ Referred to through the years as the Southeast Asia Tactical Forecast Center, the Southeast Asia Forecast Center, and the Southeast Asia Weather Center.

⁶⁶ Ltr Lt Col Leroy P. Brunner, comdr, Det 14, 1WG, to 1WG (G1C), "Activities Report, January 1968," 10Feb68.

⁶⁷ Capt D. D. Cain, forecaster, Det 14, 1WG, "End of Tour Report," 13Mar69, pp. 1, 5, included as Tab 40 of Fuller, ed., "End of Tour Reports," 15Apr70.

⁶⁸ Msg 1WG (G1OC) to 1WW (OC) and Det 9, 30WS, info Det 14 1WG and 30WS, "Forecast for Khe Sanh in Bulletin KTVM VVSD," 121000ZFeb68.

⁶⁹ Msg 1WW (OC) to 1WG (G1OC), info AWS (AWOSYC), "Cancellation of Data Requirements," 310330ZJul68.

⁷⁰ "History of Detachment 14, 1st Weather Group," Jan-Jun68, included as Annex A to "History of the 1st Weather Group," Jan-Jun68, itself included in Vol II of "History of the 1st Weather Wing," Jan-Jun68.

⁷¹ Capt Wade V. Hilton, current ops officer, HQ 1WG, "SEA End of Tour Report," p. 5, included as Tab 42 of Fuller, ed., "End of Tour Reports," 15Apr70.

⁷² Ltr and atch Maj Tommy D. Guest, ops officer, 30WS, to 30WS comdr, "End of Tour Report," 17Oct68, included as Tab 25 of Fuller, ed., "End of Tour Reports," 15Apr70; telephone interview by author on 28Jun79 with Col Guest, vice commander, 3d Weather Wing, Offutt AFB, NE.

⁷³ Maj Micale, ops officer, 5WS, "SEA End of Tour Report," p. 5, included as Tab 33 of Fuller, ed., "End of Tour Reports," 15Apr70.

⁷⁴ Ltr Capt Taylor, comdr OL-2, Det 31, 5WS, to 1WG (G1OP), "End of Tour Reports," 20Nov68, p. 1, included as Tab 29 of Fuller, ed., "End of Tour Reports," 15Apr70.

⁷⁵ Telephone interview by author on 22Jun79 with Col (USAF ret) William H. Shivar.

⁷⁶ *Ibid.*

77 Telephone interview by author on 19Jun79 with Maj Thomas E. Taylor, Svcs Div (MAC/IGIS), Directorate of Inspection, MAC Inspector General, HQ MAC.

78 *Ibid.*

79 Telephone interview by author on 25Jun79 with Col Micale.

80 Ltr Capt Taylor to LWG (GLOP), "End of Tour Report," 20Nov68.

81 See ltr Col Wood, comdr, LWG, to Col Lowell A. Stiles, comdr, LWW, "Activity Report (No 3)," 31Jul68.

82 Ltr Capt Taylor to LWG (GLOP), "End of Tour Report," 20Nov68; telephone interview by author on 19Jun79 with Maj Taylor.

83 *Ibid.*

84 *Ibid.*

85 Telephone interview by author on 25Jun79 with Col Micale.

86 Telephone interview by author on 19Jun79 with Maj Taylor.

87 Fuller and Milloy, Vol I, *Narrative (S)*, pp. 200-01, 363-64, of *The Air Weather Service in Southeast Asia*, 15Nov68. Info used (U).

88 Telephone interview by author on 19Jun79 with Maj Taylor.

89 Interview by author on 12May75 with Col Carmell. Carmell subsequently rose to the position of vice commander in AWS, from which he retired in 1975.

90 Ltr Col Wood to Aerospace Studies Institute (ASD-1R), Air University, "Project Corona Harvest End-of-Tour Report," 12Jan69, included as Tab 37 of Fuller, ed., "End of Tour Reports," 15Apr70.

91 Interview by author on 12May75 with Col Carmell.

92 *Ibid.*

93 *Ibid.*

94 "History of Detachment 14, 1st Weather Group," Jan-Jun68, p. 7, included as Annex A to "History of the 1st Weather Group," Jan-Jun68--itself included in Vol II of "History of the 1st Weather Wing," Jan-Jun68.

95 LWW, *Weather Evaluation Southeast Asia Operations: February 1968*, p. 23; LWW, *Weather Evaluation Southeast Asia Operations: March 1968*, p. 26; and LWW, *Weather Evaluation Southeast Asia Operations: April 1968*, p. 23.

96 Interview by author on 12May75 with Col Carmell.

97 Ltr Col Ray L. Bowers, ch, Special Histories Branch, Office of Air Force History, HQ USAF, to Fuller, 4Feb76. Bowers, a C-130 navigator in South Vietnam in 1967-68, authored the Air Force's official history of tactical airlift in Southeast Asia--a well researched and definitive account yet in coordination at this writing. A condensation of his effort, "Tactical Airlift," can be found in Ballard, *et al.*, *The United States Air Force in Southeast Asia, 1961-1973: An Illustrated Account*, ed. Berger (Wash DC: Office of Air Force History, HQ USAF, 1977), pp. 169-85.

97 (Cont) For a good account of Air Force airlift operations into Khe Sanh in 1968, and weather effects thereupon, see McLaughlin, "Khe Sanh: Keeping an Outpost Alive," *Air University Review*, Vol XX, No 1 (Nov-Dec68), pp. 57-77. Maj Gen McLaughlin commanded the 834th Air Division in South Vietnam, and it was his C-123s and C-130s that flew into Khe Sanh.

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CHAPTER 3 - ARMY (AND AWS) ORGANIZATION, 1970s

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⁴¹Ltr Col Martin, ops off, 16WS, to 5WW (CC), "Unit Information Report: RCS 5WW/DO(M)7203," 30Apr76, and ltr Martin to 5WW (CC), "Unit Information Report, RCS: 5 WW/DO(M)7203," 31May76, both included within Sup Doc #11 to "History of 16th Weather Squadron," Jan-Jun76, itself included as Appendix 5, Vol 2, to "History of the 5th Weather Wing," Jan-Jun76.

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CHAPTER 4 - MANPOWER AND MANNING

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⁶Ltr Capt Dale D. Webster, Rqmts Validation Directorate (AWS/-DOQ), DCS Ops, HQ AWS, to AWS (CS--ch of staff), *et al.*, "Trip Report, 2WWg Units in Germany, 16-24 March 1972," 10Apr72, included as Tab 25 in Vol VII, "Supplements," to the "History of Air Weather Service," Jul71-Jun72 (S). Info used (U).

⁷Ltr Col Leonard E. Zapinski, DCS Ops, HQ AWS, to AWS Staff, *et al.*, "Report of AWS Commander's Trip to European Area," 25Sep72, included as Tab 29 in Vol X, "Supplements," of "History of Air Weather Service," 1Jul72-30Jun74 (S). Info used (U).

⁸Ltr Col James R. Blankenship, Dep Asst for Wx (AF/PRW), DCS for Programs and Resources, HQ USAF, to Dept of Army (DAMI-DSI-C), "Direct Weather Service Support," 12Jun73, included as Sup Doc #41 in Vol III of "History of the 5th Weather Wing," Jan-Jun73.

See also: ltr and atch AWS to Det 15, 1200 Spt Sq, "Direct Weather Service Support to Deployed Army Divisions in Europe," 6Mar73; ltr Col Leon R. Tucker, ch, ops div, 2WW, to AWS (DOQ), "SOR, USTAS-COMEUR," 12Mar73; ltr and atch Col Fred R. Mathews, Dep Dir of Manpower and Org, DCS Plans, HQ MAC, to HQ USAF (PRW), "Direct Weather Service Support to the Army," 3Apr73; and ltr Blankenship to MAC (XPMRT), "Direct Weather Service Support to the Army," 25May73--included together as Sup Doc #5 in Vol II, "Supporting Documents," of this study.

Additionally, see HQ AWS, "Staff Meeting Minutes," No. 25, 18-22Jun73, pp. 3-4.

⁹Ltr Aldrich to AWS Staff and 5WW (CC), "Report of AWS/CC Trip to 5WW and 16WS, 26-28 September 1973," 10Oct73, included as Tab 57 in Vol X, "Supplements," to "History of Air Weather Service," 1Jul72-30Jun74 (S). Info used (U).

- ¹⁰Ltr Aldrich to AWS staff, *et al.*, "Report of AWS/CC Trip to 2WW," 19Oct73, included as Tab 60 in Vol X, "Supplements," to "History of Air Weather Service," 1Jul72-30Jun74 (S). Info used (U).
- ¹¹Aldrich's remarks recorded by the author at the HQ AWS staff meeting of 15Oct73.
- ¹²Atch 1 to ltr Lt Col William C. Montgomery, OL-D, 16WS, to 5WW, *et al.*, "SWO Conference," 17Jan74, included as Sup Doc #4 to "History of 16th Weather Squadron," Jul-Dec73, itself included as Atch E to "History of the 5th Weather Wing," Jul-Dec73. See also "History of the 16th Weather Squadron," Jul-Dec74, pp. 12-14, included as Appendix 5, Vol 2, of "History of the 5th Weather Wing," Jul-Dec74.
- ¹³Ltr Maj Dell V. McDonald, staff weather officer to CACDA, to 16WS (CC), "CAC Staff Weather Officer Activities Report, April 1976," 10May76, included within Sup Doc #10 to "History of the 16th Weather Squadron," Jan-Jun76, itself included as Appendix 5 in Vol 2 of "History of the 5th Weather Wing," Jan-Jun76.
- ¹⁴Much of the spadework was attributable to Capt Frederick F. Haddad, at wing headquarters, who worked very closely with Lt Col Owens at USAICS and Maj McDonald at CACDA on the TOE and UTC revisions.
- ¹⁵"History of the 5th Weather Wing," Jan-Jun76, p. 20.
- ¹⁶The proposed UTCs are included as Sup Doc #77 in Vol 3 of "History of the 5th Weather Wing," Jan-Jun76.
- ¹⁷Ltr CACDA to AWS (comdr), "Army TOE Elements for AWS Weather Teams (WETMs)," 2Jul76, included within Sup Doc #78 in Vol 3 of "History of the 5th Weather Wing," Jan-Jun76.
- ¹⁸Ltr Brig Gen Aldrich, AWS comdr, to AWS staff and 5WW (CC), "Report of AWS/CC Trip to 5WW and 16WS, 26-28 September 1973," 1Oct73, included as Tab 57 in Vol X, "Supplements," of "History of Air Weather Service," 1Jul72-30Jun74.
- ¹⁹Dept of Army Form 2496, *Action Trip Report*, Maj Dell V. McDonald, OL-E 16 WS (staff wx officer Combined Arms Combat Developments Agency, Ft Leavenworth) to Dep Comdr, CACDA, "Army/Air Force Weather Conference (20Feb74)," 25Feb74, included as Sup Doc #7 to "History of 16th Weather Squadron," Jan-Jun74, itself included as Appendix 5 in Vol 2 of "History of the 5th Weather Wing," Jan-Jun74.
- ²⁰"Minutes of the 2d Joint Working Group Weather Support to the Army, Langley AFB, VA, 22-23Oct74," included within Appendix 6 to "History of 16th Weather Squadron," Jul-Dec74, itself included as Appendix 5 in Vol 2 of "History of the 5th Weather Wing," Jul-Dec74.
- ²¹"Post Exercise Critique: REFORGER 77," n.d., included as atch to "History of the 7th Weather Squadron," Jul-Dec77, itself included as Appendix 2 to "History of the 2d Weather Wing," Jul-Dec77.
- ²²Point paper, Col Norman F. Rauscher, asst DCS Ops, HQ AWS, "AWS Manpower/Manning (AWS/CC Testimony on H.R. 8763)," 22May78.

- ²³Tech Plans Div (AWS/DOQX), Directorate of Rqmts, DCS Ops, HQ AWS, "Semiannual Report of Activities," Jul-Dec78, p. 2, included within the "Supplements" volumes to *History of Air Weather Service*, 1978.
- ²⁴Ltr Swayne to Mr. Beck, Dept of the Army (DAMI-TST-I), "Army Weather Support," 22Dec77, included as Sup Doc #6 in Vol II, "Supporting Documents," of this study.
- ²⁵See: ltr Maj Jerry E. Albrecht, current ops officer, 7WS, to 2WW (DOOQ), "Additional Manning for OL-A and OL-B," 27Jul78; and ltr Col John J. Elliff, 7WS comdr, to 2WW (DO), "OWT Configuration (AWS/DOQP Ltr, 18 August 1978)," 21Sep78--included, respectively, as Sup Docs # 59 and 60 to "History of the 7th Weather Squadron," Jul-Dec78, itself included as Appendix 3 to "History of the 2d Weather Wing," Jul-Dec78.
- ²⁶Ltr Lt Col Swayne, AWS/LN, to TRADOC (ATFE), "Liaison Activities (RCS ATFE-2)," 1Mar79.
- ²⁷All supporting documentation for this additional manning is included within Sup Doc #2 to "History of the 1st Weather Wing," Jul-Dec77.
- ²⁸See: ltr Col Joe K. Ando, Dep Dir of Manpower and Org (MAC/-XPMRZ), DCS Plans, HQ MAC, to Eighth Army comdr, "Statement of Requirements for Direct Weather Support, Eighth US Army, Korea (AR 115-12)," 24Aug78; and ltr Col Charles F. Donohue, MAC/XPMRZ, to Eighth Army comdr, "Statement of Requirements for Direct Weather Support, Eighth US Army, Korea (Your Ltr, 11Oct78)," 27Oct78--included, respectively, as Atchs 1 and 2 to ltr Capt William A. Anderson, 30WS historian, to 1WW (DOO), "Historical Report (1Jul-31Dec78)," 12Jan79, itself included as Sup Doc #12 to "History of the 1st Weather Wing," Jul-Dec78.
- ²⁹Ltr Lt Col John H. Taylor, MAC IG team ch, to Det 18 (CC) 30WS, "Report of Inspection," 18Nov78, pp. 2, 9-10.
- ³⁰Ltr and atch ("EUSA [Eighth U.S. Army] Support Study") Lt Col Joseph W. Martin, Jr, ch, ops br, 30WS, to 1WW (DO), "Reorganization of Support to EUSA," 7Dec78, included as Atch 5 to ltr Capt Anderson, 30WS historian, to 1WW (DOO), "Historical Report (1Jul-31Dec78)," 12Jan79, itself included as Sup Doc #12 to "History of the 1st Weather Wing," Jul-Dec78.
- ³¹Vol I, "Narrative," pp. 456-58, of "History of Air Weather Service," 1Jul72-30Jun74 (S). Info used (U).
- ³²See Vol I, *Narrative*, pp. 241-42, 248, of *History of Air Weather Service*, 1976 (S). Info used (U).
- ³³AWS Reg 55-2, "Operations: AWS Tactical Weather Support," 31Aug77, p. 6-1.
- ³⁴Ltr Col Hyko Gayikian, DCS Ops, HQ AWS, to 1WW (DO), *et al.*, "Assignment of WAF to Organic Weather Teams (OWTs)," 18Feb75, and msg Dept of Army (DAMO-FDU) to ALARACT, "Women in Category I Units," 041453ZFeb75, included, respectively, as Sup Docs #35 and 36 to "His-

³⁴(Cont) tory of 16th Weather Squadron," Jan-Jun75, itself included as Appendix 7 to "History of the 5th Weather Wing," Jan-Jun75.

³⁵Vol I, "Narrative," pp. 60-61, of "History of Air Weather Service," 1Jul72-30Jun74 (S). Info used (U).

³⁶Carmell's remarks recorded by the author at the HQ AWS staff meeting of 27Dec72.

³⁷From remarks by Rowe recorded by the author at the HQ AWS staff meeting of 11Mar76.

³⁸Vol I, *Narrative*, pp. 65-66, of *History of Air Weather Service*, 1976 (S). Info used (U).

CHAPTER 5 - EQUIPMENT AND MAINTENANCE

¹5WW, *Activities Report on US Army Weather Support*, 15Apr71, p. 1, included as Sup Doc #4 to "History of the 5th Weather Wing," Jan-Mar71.

²Including the AN/TMQ-14, AN/TMQ-15, and AN/TMQ-20 components, air conditioning, and ancillary equipment. (Telephone conversation by author on 28Sep78 with Mr. Max M. James, Ground Systems Engineering (AWS/LGLG), Directorate of Met Systems Engineering, DCS Logistics, HQ AWS.)

³Vol IV, *Support: Weather Services* (S), 2Nov70, pp. 10, 17-18, 23 of PACAF's Project Corona Harvest input for period 1Apr68-31Dec69, with the overall title of *In-Country and Out-Country Strike Operations in Southeast Asia*. Info used (U).

⁴Fuller and Maj William T. French, Jr, "Text of Interview with Colonel Ralph G. Suggs (Vice Commander, Air Weather Service, Aug 1967 - Feb 1970)," 1Jul70, pp. 9-11, included as Sup Doc #37 in Vol II, "Supporting Documents," of "History of Air Weather Service," 1Jul69-30Jun70 (S). Info used (U).

⁵Telephone conversation by author on 29Sep78 with Mr. Max M. James, Ground Systems Engineering (AWS/LGLG), Directorate of Met Systems Engineering, DCS Logistics, HQ AWS.

⁶See Vol I, "Narrative," pp. 28-29, of "History of Air Weather Service," 1Jul67-30Jun69 (S). Info used (U).

⁷Fuller, "The AN/TMQ-25 Tactical Ceilometer: (SEAOR 95)," Dec76, on file in AWS historical archives.

⁸*Ibid.*

⁹Msg 1WW (LGC) to AWS (LG) and LWG (LG), "TMQ-25 Problems," 150230ZMar72.

¹⁰Fuller, "The AN/TMQ-25 Tactical Ceilometer: (SEAOR 95)," Dec76.

- ¹¹*Ibid.*
- ¹²Ltr Col Joseph W. Martin, Jr, ops officer, 16WS, to 5WW (DOXX and DOXY), "TWECEB/TMQ-25," 17May76, included as Sup Doc #7 to "History of 16th Weather Squadron," Jan-Jun76, itself included as Appendix 5 in Vol 2 of "History of the 5th Weather Wing," Jan-Jun76.
- ¹³"History of 16th Weather Squadron," Jul-Dec73, p. 6f, included as Atch E to "History of the 5th Weather Wing," Jul-Dec73.
- ¹⁴Ltr Col David L. Roberts, ch, ops div, 5WW, to USCINCREC (RCJ3-TX), *et al.*, "Minutes of 5WW Tactical Weather Equipment Control Board (TWECEB) Meeting, 12 Dec 75," 29Dec75, included as Sup Doc #61 in Vol 3 of "History of the 5th Weather Wing," Jul-Dec75.
- ¹⁵Ltr Col Frank D. Reeder, ch, ops div, 2WW, to AWS (DO), "AN/TMQ-25 Tactical Cloud Height Set Requirements," 26Jan76, included as Atch 4 to ltr and 5 atch Capt Nelson Arzola, 5WW (DOXX), to 7WW, *et al.*, "Minutes of the Tactical Weather Equipment Control Board (TWECEB) 2 April 1976," 3May76, included as Sup Doc #80 in Vol 3 of "History of the 5th Weather Wing," Jan-Jun76.
- ¹⁶Directorate of Environmental Services (AWS/DOS), DCS Ops, HQ AWS, "Semiannual Historical Report," Jan-Jun77, p. 4, included within the "Supplements" volumes of *History of Air Weather Service*, 1977.
- ¹⁷Ltr and atch ("US Forestry Service Contributes to Southeast Asian War Effort") Col Arthur W. Anderson, ch of staff, AWS, to MAC (MAXPD), "Weekly Report for the President," 4Nov66.
- ¹⁸Ltr and atch Lt Col John W. Reames, ch, ops and trng br, wx ops div, HQ TAC (WEO), to HQ USAF (PRW), *et al.*, "Concept of Operations for the Tactical Meteorological Measuring Set (AN/TMQ-22)," 2Aug74, included as Sup Doc #56 in Vol IV of "History of the 5th Weather Wing," Jul-Dec74.
- ¹⁹Announcement by Col Douglas C. Purdy, DCS Ops, HQ AWS, recorded by the author at the morning weather reconnaissance briefing at HQ AWS on 27Mar70, and from remarks by Col Edwin E. Carmell, asst DCS Ops, HQ AWS on 2Sep70. See also: ltr and atch Lt Col Mortimer F. Bennet, HQ AWS Tactical Weather Support Panel, "Report of HQ AWS Tactical Weather Support Capabilities Panel 70-6," 22Jul70, p. 4; and HQ TAC, *Activities Report on Tactical Weather Systems/Equipment* (FOUO), 15Jul70, pp. 1-2, included as Sup Doc #1 to "History of the 5th Weather Wing," Apr-Jun70.
- ²⁰HQ TAC, *Activities Report on Tactical Weather Systems/Equipment* (FOUO), 15Oct70, p. 1, included as Sup Doc #1 to "History of the 5th Weather Wing," Jul-Sep70.
- ²¹The remarks of Best and Carmell were recorded by the author at the morning weather reconnaissance briefing at HQ AWS on 2Sep70.
- ²²Ltr Col Arthur W. Anderson, ch of staff, AWS, to AWS (SY, *et al.*), "Staff Meeting Actions - 24 September 1970," 24Sep70.
- ²³Best's remarks recorded by the author at the morning weather reconnaissance briefing at HQ AWS on 16Sep70.

- ²⁴ Best's remarks recorded by the author at the morning weather reconnaissance briefing at HQ AWS on 24Sep70.
- ²⁵ 5WW, *Activities Report on US Army Weather Support* (FOUO) 15Apr71, p. 4, included as Sup Doc #4 in "History of the 5th Weather Wing," Jan-Mar71, and HQ TAC, *Activities Report on Tactical Weather Systems/Equipment* (FOUO), 15Jul72, p. 4, included as Sup Doc #61 in Vol III of "History of the 5th Weather Wing," Jan-Jun72.
- ²⁶ Msg ESD to OCAMA, info AWS (DME and DMS) and Comd Gen USAECOM, "MIPR [Military Interdepartmental Purchase Request] 2835-70-00028 for AN/TMQ-22 Equipment," 211825ZApr71.
- ²⁷ See: TAC, *Activities Report on Tactical Weather Systems/Equipment* (FOUO), 1Apr73, p. 2, included as Sup Doc #47 in Vol III of "History of the 5th Weather Wing," Jan-Jun73; HQ TAC, *Activities Report on Tactical Weather Systems/Equipment* (FOUO), 15Jul73, p. 2, included as Sup Doc #48 in Vol III of "History of the 5th Weather Wing," Jan-Jun73; HQ TAC, *Activities Report on Tactical Weather Systems/Equipment* (FOUO), 15Oct73, p. 3, included as Sup Doc #55 in Vol II of "History of the 5th Weather Wing," Jul-Dec73; HQ TAC, *Activities Report on Tactical Weather Systems/Equipment* (FOUO), 15Apr74, p. 3, included as Sup Doc #44 in Vol IV of "History of the 5th Weather Wing," Jan-Jun74; HQ TAC, *Activities Report on Tactical Weather Systems/Equipment* (FOUO), 15Jan75, p. 3, included as Sup Doc #61 in Vol IV of "History of the 5th Weather Wing," Jul-Dec74; HQ TAC, *Activities Report on Tactical Weather Systems/Equipment* (FOUO), 15Jul75, p. 2, included as Sup Doc #59 in Vol IV of "History of the 5th Weather Wing," Jan-Jun75; HQ TAC, *Activities Report on Tactical Weather Systems/Equipment* (FOUO), 15Oct75, p. 3; and HQ TAC, *Activities Report on Tactical Weather Systems/Equipment* (FOUO), 15Jan76, p. 2, included as Sup Docs #71 and 72, respectively, in "History of the 5th Weather Wing," Jul-Dec75.
- ²⁸ From announcement by Col Hyko Gayikian, DCS Ops, HQ AWS, recorded by the author at the HQ AWS staff meeting of 16Jan75.
- ²⁹ Ltr and 5 atch Capt Nelson Arzola, 5WW (DOXX), to 7WW, *et al.*, "Minutes of the Tactical Weather Equipment Control Board (TWECEB), 2 April 1976," 3May76, included as Sup Doc #80 in Vol III of "History of the 5th Weather Wing," Jan-Jun76.
- ³⁰ Vol I, *Narrative*, pp. 58-59, of *History of Air Weather Service*, 1976 (S). Info used (U).
- ³¹ DCS Logistics, HQ AWS, "Historical Report," Jan-Jun77, pp.5-6, included within the "Supplements" volumes to *History of Air Weather Service*, 1977.
- ³² Ltr Col John R. Moulton, MAC IG, to 2WW (CC), "Report of Management Effectiveness Inspection, 16-20 May 1977," 20May77, pp. 10-11, included within the "Supplements" volumes to *History of Air Weather Service*, 1977.
- ³³ Readiness Div (AWS/DOQP), Directorate of Rqmts, DCS Ops, HQ AWS, "Semiannual Report of Activities," Jul-Dec77, p. 3, included within the "Supplements," volumes to *History of Air Weather Service*, 1977.
- ³⁴ AWSR 55-2, "Operations: AWS Tactical Weather Support," 31Aug77.

- 35 HQ AWS, "Staff Meeting Minutes," No. 31, 5-12Oct78, p. 1; DCS Logistics, HQ AWS, "Historical Report," Jul-Dec78, p. 6, included within the "Supplements" volumes to *History of Air Weather Service*, 1978.
- 36 HQ AWS, "Staff Meeting Minutes," No. 22, 22Jun78, p. 1.
- 37 Lt Col William J. Haugen, DCS Logistics, HQ AWS, "Significant Events - LG," 22Sep78.
- 38 HQ AWS, "Staff Meeting Minutes," No. 1, 4-11Jan79, p. 1.
- 39 AWS Recurring Pub 105-1, *Operations Digest*, No. 5 (May79), p. 11.
- 40 HQ TAC, *Activities Report on Tactical Weather Systems/Equipment*, 15Apr70, p. 2, included as Sup Doc #2 in "History of the 5th Weather Wing," Oct-Dec70; HQ TAC, *Activities Report on Tactical Weather Systems/Equipment*, 15Jul71, p. 5, included as Sup Doc #6 in "History of the 5th Weather Wing," Apr-Jun71; and HQ TAC, *Activities Report on Tactical Weather Systems/Equipment*, 15Oct71, pp. 2-3, included as Sup Doc # 17 in "History of the 5th Weather Wing," Jul-Dec71.
- 41 TAC Concept Review, *A Tactical Weather Subsystem to Interface with USAF Global Weather System During 1970-1975* (Langley AFB, VA: HQ TAC, 15Oct69), p. 1.
- 42 Ltr and 5 atch Lt Col William E. Cummins, II, Rqmts Validation and Fcsting Spt Div, DCS Ops, HQ AWS, to 1WW, *et al.*, "Army Weather Support Conference," 18May70.
- 43 HQ TAC, *Activities Report on Tactical Weather Systems/Equipment*, 15Jan72, p. 3, included as Sup Doc #19 in "History of the 5th Weather Wing," Jul-Dec71.
- 44 Directorate of Fcstg Svcs, DCS Ops, HQ AWS, "Semi-Annual Report of Activities," Jul-Dec71, pp. 4-5, included within Tab 6 in Vol VI, "Supplements," of "History of Air Weather Service," 1Jul71-30Jun72 (S). Info used (U).
- 45 Ltr and 5 atch Lt Col Raymond B. MacQueen, Directorate of Rqmts Validation, DCS Ops, HQ AWS, to USACDC, *et al.*, "USACDC Visit to Hq AWS," 1Feb72.
- 46 HQ TAC, *Activities Report on Tactical Weather Systems/Equipment*, 15Jul72, p. 3, included as Sup Doc #61 in Vol III of "History of the 5th Weather Wing," Jan-Jun72.
- 47 HQ TAC, *Activities Report on Tactical Weather Sensors/Equipment*, 15Oct72, p. 2, included as Sup Doc #36 in Vol II of "History of the 5th Weather Wing," Jul-Dec72.
- 48 HQ TAC, *Activities Report on Tactical Weather Systems/Equipment*, 1Apr73, p. 5, included as Sup Doc #48 in Vol III of "History of the 5th Weather Wing," Jan-Jun73.
- 49 Text of briefing by Lt Col Peter N. Micale, HQ AWS (AWS/DOO), "Ground Equipment Acquisition," presented at the AWS commanders conference of 30-31Jul73, included as pp. 14-2 through 14-26 in Sup

- ⁴⁹ (Cont) Doc #125, Vol IV, "Supporting Documents," of "History of Air Weather Service," 1Jul72-30Jun74 (S). Info used (U).
- ⁵⁰ HQ TAC, *Activities Report on Tactical Weather Systems/Equipment*, 15Jan74, pp. 1-2, included as Sup Doc #56 in Vol III of "History of the 5th Weather Wing." Jul-Dec73.
- ⁵¹ HQ TAC, *Activities Report on Tactical Weather Sensors/Equipment*, 15Oct73, p. 3, included as Sup Doc #55 in *ibid*.
- ⁵² 6WW Recurring Pub 105-1, *Technical Activities Summary*, No. 2 (Feb74), p. 9.
- ⁵³ HQ TAC, *Activities Report on Tactical Weather Sensors/Equipment*, 15Apr74, p. 3, included as Sup Doc #44 in Vol 4 of "History of the 5th Weather Wing," Jan-Jun74.
- ⁵⁴ 6WW, *Technical Activities Summary* (Jul74), pp. 5-6, HQ TAC, *Activities Report on Tactical Weather Sensors/Equipment*, 15Jul74, p. 3, included as Sup Doc #45 in Vol 4 of *ibid*.
- ⁵⁵ Directorate of Obs Svcs and Equip, DCS Ops, HQ AWS, "Semi-annual Historical Report," Jan-Jun74, included within Tab 4 in Vol IX, "Supplements," of "History of Air Weather Service," 1Jul72-30Jun74.
- ⁵⁶ HQ TAC, *Activities Report on Tactical Weather Sensors/Equipment*, 15Oct74, p. 2, included as Sup Doc #60 in Vol 4 of "History of the 5th Weather Wing," Jul-Dec74; 6WW, *Technical Activities Summary*, Jul74, p. 5, Aug74, p. 25, Oct74, p. 8, and Nov74, p. 7.
- ⁵⁷ Ltr and atch Lt Col John W. Reames, ch, wea ops and trng br, wea ops div, HQ 5WW, to HQ USAF (PRW), *et al.*, "Concept of Operations for Tactical Weather Radar (TWR)," 2Aug74, included as Sup Doc #57 in Vol 4 of "History of the 5th Weather Wing," Jul-Dec74.
- ⁵⁸ 2WS, *Technical Activities Summary*, Aug75, p. 12.
- ⁵⁹ *Ibid.*, May76, p. 20.
- ⁶⁰ *Ibid.*, Sep77, p. 10; Directorate of Environmental Sensors (AWS/DOS), DCS Ops, HQ AWS, "Semiannual Historical Report," Jul-Dec77, p. 2; and DCS Logistics, HQ AWS, "Historical Report," Jul-Dec77, p. 11--the latter two documents included within the "Supplements" volumes to *History of Air Weather Service*, 1977.
- ⁶¹ 2WS, *Technical Activities Summary*, Apr78, p. 12, and May78, p. 15; DCS Logistics, HQ AWS, "Historical Report," Jan-Jun78, p. 6; Directorate of Environmental Sensors (AWS/DOS), DCS Ops, HQ AWS, "Semiannual Historical Report," Jan-Jun78, p. 2; and AWS/DOS, "Semi-annual Historical Report," Jul-Dec78, pp. 2-3--the latter three reports included within the "Supplements" volumes to *History of Air Weather Service*, 1978.
- ⁶² *Ibid.*
- ⁶³ According to AWSP 105-53, *Weather: Air Weather Service Meteorological Sensors and Related Equipment*, of 30Sep78 (pp. 1-47 through 1-54), the unit cost for the AN/FPS-103 was \$26,787, while the cost for six AN/TPS-68s was \$4.15 million. The unit cost of the

⁶³(Cont) two other radars in the AWS inventory in 1978, the AN/CPS-9 (an X-band radar, the first of which was installed in 1954) and the AN/FPS-77 (a C-band radar, the first of which was installed for Category II and III testing in 1964) was \$124,945 and \$54,112, respectively.

⁶⁴Position paper, Col Salvatore R. LeMole, DCS Ops, HQ AWS, "AWS Position on Acquiring Tactical Weather Radars for Support to Army in the Field Environment," 26Jun78, included as one of eight attach to ltr LeMole to lww (DO), *et al.*, "AWS Army Support Position Papers," 26Jun78--itself included as Sup Doc #65 in Vol 4 of "History of the 5th Weather Wing," Jan-Jun78.

⁶⁵Fuller, ed., AWS Historical Study No. 5, *Air Weather Service and Meteorological Satellites: 1950 - 1960*, Dec73, pp. 25-29.

⁶⁶Vol I, *Narrative*, p. 189, of *History of Air Weather Service*, 1976 (S). Info used (U).

⁶⁷Fuller, *Weather and War*, Dec74, p. 16; Momyer, *Air Power in Three Wars*, pp. 228-31; and ltr Gen Momyer, comdr TAC, to HQ USAF (AFRDC), "Transportable Weather Satellite Facility," 10Jan70.

⁶⁸Vol I, *Narrative*, p. 189, of *History of Air Weather Service*, 1976 (S). Info used (U).

⁶⁹*Ibid.*, 219.

⁷⁰Telephone interview by author on 6Oct78 with Col William E. Cummins, II, commander, OL-C, 5WW, at Fort Monroe, VA. Cummins commanded the 5th Weather Squadron from mid-1968 to mid-1969.

⁷¹Conversation by author on 28Sep78 with Lt Col John H. Haneklau, Env Svcs Div (MAX/XPPE), Directorate of Programming and Policy, DCS Plans, HQ MAC. In 1965-66 Haneklau commanded Det 31, 5WS, at Nha Trang in support of I Field Force.

⁷²Telephone interview by author on 2Aug79 with Lt Gen (U.S. Army ret) Tolson.

⁷³Reasons why DMSP was operated in such secrecy, which remained classified in 1977, can be found in Vol I, *Narrative*, p. 189, of *History of Air Weather Service*, 1976 (S). Info used (U).

⁷⁴It took a personal message from a three-star general on the Air Staff to the Seventh Air Force commander before Col Leonard E. Zapinski would release DMSP data to the Son Tay raiders. Afterward, the AWS commander at the time came to refer to the raid as the classic case of applying DMSP data to a tactical combat operation. (From remarks by Brig Gen William H. Best, Jr, AWS commander, recorded by the author at the HQ AWS staff meeting of 26May72.) See Vol I, "Narrative," pp. 456-95, of "History of Air Weather Service," 1Jul70-30Jun71 (S) Info used (U); Fuller, draft, *Keith R. Grimes, Special Operations Weatherman: An Oral Autobiography*, Mar78, pp. 163-64; and Benjamin F. Schemmer, *The Raid* (New York: Harper & Row, 1976), pp. 183-86.

⁷⁵Vol I, *Narrative*, p. 191, of *History of Air Weather Service*, 1976 (S). Info used (U).

76 Ltr Aldrich to AWS Staff, *et al.*, "Report of AWS/CC Trip to 2WW," 19Oct73, included as Tab 60 in Vol X, "Supplements," of "History of Air Weather Service," 1Jul72-30Jun74.

77 Ltr Lt Col James C. Owens, staff weather officer to USAICS, to 16WS (CC), "Unit Activity Letter February 1976," 4Mar76, included within Sup Doc #9 to "History of 16th Weather Squadron," Jan-Jun76, itself included as Appendix 5 in Vol 2 of "History of the 5th Weather Wing," Jan-Jun76.

78 Vol I, *Narrative*, pp. 197, 201, of *History of Air Weather Service*, 1976 (S). Info used (U).

79 *Ibid.*, pp. 190-91.

80 See: ltr Lt Col Owen Y. Macy, OL-A, 5WW, to OL-C 5WW, "Unit Information Report (RCS: 5WW DO(M) 7203)," 4Oct77; ltr Lt Col Darrell T. Holland, OL-E, 5WW, to OL-C 5WW, "Unit Information Report - August 1977," 2Sep77; ltr Holland to OL-C 5WW, "Unit Information Report - September 1977," 3Oct77; and ltr Holland to OL-C 5WW, "Unit Information Report - December 1977," 5Jan78--all included, respectively, within Sup Docs 9 and 11 of "History of OL-A, C, and E, 5th Weather Wing," Jul-Dec77, itself included as Appendix 2 in Vol 1 of "History of the 5th Weather Wing," Jul-Dec77.

81 *Ibid.*

82 Col Salvatore R. LeMole (DCS Ops, HQ AWS), Chairman, Program Review Committee, HQ AWS, "Report of HQ AWS Council Meeting [to approve SIDS ROC]," 1Sep76, and 3 atch, included within Sup Doc #39 in Vol II, "Supporting Documents," of *History of Air Weather Service*, 1976 (S). Info used (U).

83 The SIDS GOR is included as Atch 3 to the Jan-Jun78 historical report of the Aerospace Rqmts Div (AWS/DNTR), Directorate of Aerospace Svcs, DCS Aerospace Sciences, HQ AWS--itself included within the "Supplements" volumes to *History of Air Weather Service*, 1978.

84 "History of the 1st Weather Wing," Jul-Dec78, p. 19.

85 Directorate of Env Sensors (AWS/DOS), DCS Ops, HQ AWS, "Semi-annual Historical Report," Jul-Dec77, p. 5, included within the "Supplements" volumes to *History of Air Weather Service*, 1977.

86 The Army's only DMSP readout van was located on Kwajalein, in support of the Kwajalein Missile Range, and the Army contracted for the operation and maintenance.

87 Position paper, Col Salvatore R. LeMole, DCS Ops, HQ AWS, "AWS Position Concerning the Need for and Capability to Receive High Resolution Satellite Imagery to Support Army Tactical Operations," 26Jun78, included as Atch 7 to ltr LeMole to 1WW (DO), *et al.*, "AWS Army Support Position Papers," 26Jun78--itself included as Sup Doc #65 in Vol 4 of "History of the 5th Weather Wing," Jan-Jun78.

88 Ltr Lt Col Charles J. Swayne, Army liaison officer to AWS, to TRADOC (ATFE), "Liaison Activities (RCS ATFE-2)," 15Feb79.

- ⁸⁹"History of the 5th Weather Wing," Jul-Dec78, p. 17.
- ⁹⁰Vol I, "Narrative," pp. 273-91, of "History of Air Weather Service," 1Jul69-30Jun70 (S). Info used (U).
- ⁹¹*Ibid.*, 291-96. ⁹²*Ibid.*, 296-308.
- ⁹³U.S., Congress, Senate, Subcommittee of the Committee on Appropriations, *Hearings, Department of Defense Appropriations for Fiscal Year 1970*, 91st Cong, 1st Sess, Pt. 4, 1969, p. 918; and U.S. Congress, House, Subcommittee on Department of Defense of the Committee on Appropriations, *Hearings, Department of Defense Appropriations for 1972*, 92d Cong, 1st Sess, Pt. 6, 1971, p. 182.
- ⁹⁴Vol I, "Narrative," pp. 308-11, of "History of Air Weather Service," 1Jul69-30Jun70.
- ⁹⁵"New Weather Station Will Aid Forecasters," *Observer*, Vol 18, No. 11 (Nov71), p. 6.
- ⁹⁶Msg CSAF (RDQPS) to TAC (DR and DOQS) and MAC (DR and DOQS), info AWS, AFSC, and AFCRL, "Reaffirmation of Requirement For the Expendable Remote Operating Weather Station (EROWS)," 101953ZFeb72.
- ⁹⁷HQ TAC, *Activities Report on Tactical Weather System/Equipment*, 15Jul72, p. 4, included as Sup Doc #61 in Vol III of "History of the 5th Weather Wing," Jan-Jun72.
- ⁹⁸Fuller, "Text of Interview With Brigadier General William H. Best, Jr, (Commander of Air Weather Service)," 19-20Jun73, p. 26, included as Sup Doc #1 in Vol II, "Supporting Documents," of "History of Air Weather Service," 1Jul72-30Jun74.
- ⁹⁹Msg CSAF (RDP) to AFSC (DL and AC), info AFCRL (LY), *et al.*, "Expendable Remote Operating Weather Station (EROWS)," 242252ZMar72.
- ¹⁰⁰HQ TAC, *Activities Report on Tactical Weather System/Equipment*, 15Apr75, p. 3, included as Sup Doc #58 in Vol 4 of "History of the 5th Weather Wing," Jan-Jun75.
- ¹⁰¹Background paper Col Robert M. Gottuso, DCS Aerospace Sciences, HQ AWS, "Tactical Area Weather Sensors (TAWS)," 20Jan77.
- ¹⁰²Point paper, Col Gottuso, "Remote Automatic Weather Station (RAWS)," 19Sep77.
- ¹⁰³See the Jul-Dec77 historical report (p. 2) of the Aerospace Rqmts Div (AWS/DNTR), Directorate of Aerospace Svcs, DCS Aerospace Sciences, HQ AWS, included within the "Supplements" volumes to *History of Air Weather Service*, 1977.
- ¹⁰⁴The draft PRESSURS GOR of 1May78 is included as Atch 5 to the Jan-Jun78 historical report of the Aerospace Rqmts Div (AWS/DNTR)-- itself included within the "Supplements" volumes to *History of Air Weather Service*, 1978.
- ¹⁰⁵Telephone conversation by author on 19Jul79 with Mr. Edwin B. Dickson, Science & Tech Div, Directorate of Aerospace Development

105 (Cont) (AWS/DND), DCS Aerospace Sciences, HQ AWS. Mr. Dickson was HQ AWS' GOR monitor.

106 Ltr Maj Charles A. Diaz, OL-C 5WW (asst staff weather officer to TRADOC), to 5WW (CC), "Unit Information Report - August 1978," 11Sep78, included as Sup Doc #2-1 to "History of OL-A, C, and E, 5th Weather Wing," Jul-Dec78--itself included as Appendix 2 in Vol 1 of "History of the 5th Weather Wing," Jul-Dec78.

107 Rowe Interview: Army Weather Support, Jun78, pp. 45-47.

108 AR 115-10/AFR 105-3, "Environmental Services: Meteorological Support for the U.S. Army," 9Jun70, p. 2-1.

109 See, for example, AWSM 55-2, *Operations: Weather Support for Joint Force Operations*, 30Mar73, p. A6-1.

110 Ltr Col David L. Roberts, ch, ops div, 5WW, to AWS (DO), "Tactical Weather Support Concepts - A Status Report," 8Jul75, included as Sup Doc #57 in Vol 4 of "History of the 5th Weather Wing," Jan-Jun75.

111 Msg 5WW (DOX) to Comdr USAICS (ATSI-CTD-MS-SWO), *et al.*, info Det 1, 16WS, *et al.*, "Recommended TOE Changes for Army Weather Support," 061800ZDec74, included as Sup Doc #52 in Vol 4 of "History of the 5th Weather Wing," Jan-Jun75.

112 "AWS Weather Service (AWS) Position on Army Weather Communications," n.d. (*circa* 1975), included within Sup Doc #40 to "History of 16th Weather Squadron," Jan-Jun75, itself included as Appendix 7 to "History of the 5th Weather Wing," Jan-Jun75.

113 Ltr Lt Col Joseph W. Martin, Jr, ops officer, 16WS, to 5WW (DOXX), "Tactical Facsimile," 28Jan76, included as Sup Doc #4 to "History of 16th Weather Squadron," itself included as Appendix 5 in Vol 2 of "History of the 5th Weather Wing," Jan-Jun76.

114 "History of OL-A, C, and E, 5th Weather Wing," Jul-Dec77, p. 3, included as Appendix 2 in Vol 1 of "History of the 5th Weather Wing," Jul-Dec77.

115 Ltr Lt Col John F. Pohle, ch, ops and trng br (5WW/DOOT), ops div, HQ 5WW, to 5WS (DO), "FGC-25/25X Maintenance Problems," 27Oct77, included as Sup Doc #24 in Vol 3 of "History of the 5th Weather Wing," Jul-Dec77.

116 "Summary of REFORGER 76," and "Reforger 76 MSI Test Report," included as atchs to "History of 7th Weather Squadron," Jul-Dec76, itself included as Appendix II to "History of the 2d Weather Wing," Jul-Dec76.

117 Memo Capt Thomas D. Accola, current ops off, 5WS, "Post REFORGER 76 Briefing of 101st ABD SWO," 27Oct76, included as Sup Doc #18 to "History of 5th Weather Squadron," Jul-Dec76, itself included as Appendix 4 in Vol 2 of "History of the 5th Weather Wing," Jul-Dec76.

118. Ltr Lt Col Wilbert G. Maunz, ops officer, 7WS, to 2WW (DO), "Summary of WINTEX 77," 6May77, included as Atch 3 to "History of 7th Weather Squadron," Jan-Jun77, itself included as Appendix 2 to "History of the 2d Weather Wing," Jan-Jun77.
119. "Post Exercise Critique: REFORGER 77," n.d., included as atch to "History of the 7th Weather Squadron," Jul-Dec77, itself included as Appendix 2 to "History of the 2d Weather Wing," Jul-Dec77.
120. Vol I, *Narrative*, pp. 181-82, of *History of Air Weather Service*, 1976.
121. Ltr Lt Col Dale C. Barnum, staff weather officer, 8th Army, to UNC/USFK/EUSA (CJ-TE-E), "Team Spirit 77 Post Exercise Report," 26Apr77, included within Sup Doc #52 of "History of the 1st Weather Wing," Jan-Jun77.
122. "History of the 1st Weather Wing," Jul-Dec77, pp. 12-17; Jan-Jun78, pp. 11-12; and Jul-Dec78, pp. 17-18.
123. Vol I, *Narrative*, pp. 232-33, of *History of Air Weather Service*, 1976.
124. Msg 2WW (DOK) to AWS (SYCF), info 7WS (DO) and USCINCEUR (ECJ3-WE), "Army Weather Support (Facsimile)," 170916ZJan77.
125. "History of the 2d Weather Wing," Jul-Dec77, pp. 5-6.
126. TAC Concept Review, *A Tactical Weather Subsystem to Interface with USAF Global Weather System During 1970-1975* (Langley AFB VA: HQ TAC, 15Oct69), p. 1.
127. "Summary of REFORGER 76," and "Reforger 76 MSI Test Report," included as atchs to "History of 7th Weather Squadron," Jul-Dec76, itself included as Appendix II to "History of the 2d Weather Wing," Jul-Dec76.
128. Msg 2WW (DO) to AWS (SYCF), info 3LWS (DOX), 7WS (DOX), and USEUCOM (ECJ3-WE), "Army Weather Support," 170917ZJan77, and msg 2WW (DO) to AWS (SYCF), info 7WS (DO) and 3LWS (DO), "Army Weather Support Requirements," 111402ZMay77.
129. Msg AWS (CS) to 2WW (DO), info 7WS (DO) and 3LWS (DO), "Army Weather Support Requirements," 261830ZJul77, included as Sup Doc #7 in Vol II, "Supporting Documents," of this study.
130. See: msg HQ USAF (KRC and PRW) to AWS (CS) and AFCS (CS, DO, and EP), "MSQ-10 Weather Intercept Van Requirements," 071200ZJun77; and msg HQ USAF (KRC and PRW) to AWS (CS) and AFCS (CS, DO, and EP), "Army Weather Support Requirements," 071230ZJun77--included together as Sup Doc #8 in Vol II, "Supporting Documents," of this study.
131. Memo Lt Col Swayne, Army liaison officer to AWS, to Fuller, 4Apr79; telephone conversation by author on 20Jul79 with Maj Glenn W. McBride, assigned within DCS Ops Plans, HQ MAC. McBride gave the referenced briefing on 4Jun77 while assigned to HQ AWS.
132. Vice the field army, in recognition of the Army's EAD decision of 1973 whereby the EAD corps would be the highest tactical element within any given theater of operations.

¹³³Ltr and atch (AWS draft of AR 115-10/AFR 105-3, 13Dec77) Col Ramon C. Wilkins, ch of staff, AWS, to MAC (XPP), "AR 115-10/AFR 105-3, Weather Support to the US Army," 15Dec77; and ltr and atch (AWS draft of AR 115-10/AFR 105-3, 13Dec77) Col John D. Sims, Dir, Programming and Policy (MAC/XPP), DCS Plans, HQ MAC, to HQ USAF (PRW), "AR 115-10/AFR 105-3, Weather Support to the US Army," 17Jan78--both of which are included as supporting documents to this history.

¹³⁴Ltr Lt Col Swayne, Army liaison officer to AWS, to TRADOC (ATFE), "Liaison Activities (RCS AFTE-2)," 7Apr78.

¹³⁵Ltr Lt Col Swayne to TRADOC (ATFE), "Liaison Activities (RCS AFTE-2)," 5Jul78. See also ltr and 10 atch Capt Charles M. Russell, Exercise Purple Bare project officer, to 5WW (CC), "After Action Report, Exercise PURPLE BARE, 27-30 June 1978," 14Jul78, included as Sup Doc #68 in Vol 4 of "History of the 5th Weather Wing," Jan-Jun78.

¹³⁶Memo Lt Col Swayne to Fuller, 4Apr79. ¹³⁷*Ibid.*

¹³⁸Ltr and 2 atch Lt Col Swayne to TRADOC (ATFE), "Liaison Activities (RCS AFTE-2)," 10Oct78.

¹³⁹Ltr 2WW (DOX) to AWS (DO), "Tactical Weather Analysis Center (TWAC) Requirement," 13Sep78; ltr 2WW (DOK) to AWS (SY), "Tactical Weather Communications Support to US Army," 13Sep78; msg 2WW (DOX) to AWS (DOQ), info 1WW (DOX), 5WW (DOX), and AWS (SY), "Tactical Weather System," 141530ZSep78. See also ltr and atch (position paper Lt Col Glen A. Ryan, asst DCS Ops, HQ AWS, "Tactical Weather System," 31Oct78) Lt Col Wilbert G. Maunz, ch, Readiness Div (AWS/DOQP), Directorate of Rqmts, DCS Ops, HQ AWS, to 2WW (DOOT), "TWAC Training," 17Nov78, included as Sup Doc #4 to "History of the 2d Weather Wing," Jul-Dec78.

¹⁴⁰For a good overview on how AWS envisioned using AWDS to support USAREUR see ltr and atch ("Concept of Operations in Support of USAREUR"), Col Hyko Gayikian, ch of staff, AWS, to 2WW (CC), "USAREUR Support for the Automated Weather Distribution System," 17May77, included as Sup Doc #9 in Vol II, "Supporting Documents," of this study.

¹⁴¹Vol I, *Narrative*, pp. 55-58, of *History of Air Weather Service*, 1976, and background paper, Col Salvatore R. LeMole, DCS Ops, AWS, "Maintenance Support Requirements," 31May77.

CHAPTER 6 - TOEs: SIGNAL OR INTEL "PROPONENCY"?

¹See: 5WW, *Activities Report on US Army Weather Support, 1 April - 30 June 1970*, (FOUO) 15Jul70, p. 2, included as Sup Doc #2 to "History of the 5th Weather Wing," Apr-Jun70; and 5WW, *Activities Report on US Army Weather Support, 1 April - 30 June 1972*, (FOUO) 15Jul72, p. 4, included as Sup Doc #63 in Vol III of "History of the 5th Weather Wing," Jan-Jun72.

²Ltr and 2 atch Brig Gen William H. Best, Jr, comdr, AWS, to MAC (CC), "Recommendation for Award of the Air Force Outstanding Unit Award," n.d. (circa Mar72), pp. 4-5, included as Sup Doc #13 in

- ² (Cont) Vol II of "History of the 5th Weather Wing," Jan-Jun72.
- ³ 5WS Reg 55-4, "Operations: Tactical Army Equipment and Training," 21Nov75, included as Appendix 8 to "History of the 5th Weather Squadron," Jul-Dec75, itself included as Appendix 4 in Vol I of "History of the 5th Weather Wing," Jul-Dec75.
- ⁴ "Minutes of the 2d Joint Working Group Weather Support to the Army, Langley AFB, 22-23 Oct 74," included within Appendix 6 to "History of the 16th Weather Squadron," Jul-Dec74, itself included as Appendix 5 in Vol 2 of "History of the 5th Weather Wing," Jul-Dec74.
- ⁵ "History of the 5th Weather Wing," Jan-Jun75, p. 16.
- ⁶ *Ibid.*, p. 18.
- ⁷ Ltr McDonald to 16WS (CC), "CACDA Staff Weather Officer Activities Report, November 1974," 11Dec74, included within Appendix 11 to "History of the 16th Weather Squadron," Jul-Dec74, itself included as Appendix 5 in Vol 2 of "History of the 5th Weather Wing," Jul-Dec74.
- ⁸ Memo Col Walter R. Brett, comdr, 16WS, to TRADOC (ATCD-SC-I), "Review for Combat Intelligence-EAD," 7Jul75, included as Sup Doc #2 in "History of the 16th Weather Squadron," Jul-Dec75, itself included as Appendix 7 in Vol 2 of "History of the 5th Weather Wing," Jul-Dec75.
- ⁹ Ltr and atch Lt Col Joseph W. Martin, ops off, 16WS, to 5WW (DO), "Tactical Reconnaissance and Surveillance (TARS-75), Divisional Military Intelligence Company," 20Nov74, included as Sup Doc #52 in Vol 4 of "History of the 5th Weather Wing," Jul-Dec74.
- ¹⁰ Ltr Col David L. Roberts, ch, ops div, 5WW, to 16WS (DO), "Tactical Reconnaissance and Surveillance (TARS-75), Divisional Intelligence Company," 12Dec74, included as Sup Doc #53, in Vol 4 of "History of the 5th Weather Wing," Jul-Dec74.
- ¹¹ Ltr Col Roberts to AWS (DO), "TARS-75 (AWS/DOQ Ltr, 27 Nov 74)," 20Dec74, included within Appendix 10 to "History of the 16th Weather Squadron," Jul-Dec74, itself included as Appendix 5 in Vol 2 of "History of the 5th Weather Wing," Jul-Dec74.
- ¹² See: disposition form and atchs Maj Jimmie D. Auten, ch, ops br, 5WS, to DCSI (AFIN-RD) FORSCOM, "Evaluation of TARS-75 MI Organization," 23Oct75, included as Appendix 24 to "History of the 5th Weather Squadron," Jul-Dec75, itself included as Appendix 4 in Vol 1 of "History of the 5th Weather Wing," Jul-Dec75; memo and atchs Maj Frederick, "Combat Intelligence Company Evaluation Report," 11Sep-75, included as Sup Doc #69 in Vol 3 of "History of the 5th Weather Wing," Jul-Dec75.
- ¹³ Ltr and 2 atch Col Cooke W. Leutwyler, Dir of Rqmts (AWS/DOQ), DCS Ops, AWS, to 1WW (DO), *et al.*, "Tactical Weather Support Concept Conference, 15-17 Sep 75," 24Oct75, included as Sup Doc #68 in Vol 3 of "History of the 5th Weather Wing," Jul-Dec75.
- ¹⁴ Ltr Maj McDonald, staff weather officer to CACDA, to 16WS (CC), "CAC Staff Weather Officer Activities Report, December 1975,"

¹⁴(Cont) 6Jan76, included within Sup Doc #39 to "History of the 16th Weather Squadron," Jul-Dec75, itself included as Appendix 7 in Vol 2 of "History of the 5th Weather Wing," Jul-Dec75.

¹⁵See ltr Capt R. E. Decker, ACG admin of, USACACDA, to TRADOC (ATCD-SIE), "Proponency for Meteorology Support Requirements," 17Feb76, atch to ltr Lt Col James C. Owens, staff weather officer to USAICS, to 16WS (CC), "Unit Activity Letter, (February 1976)," 4Mar76, included within Sup Doc #9 to "History of the 16th Weather Squadron," Jan-Jun76, itself included as Appendix 5 in Vol 2 of "History of the 5th Weather Wing," Jan-Jun76; ltr Maj Dell V. McDonald, staff weather officer to USCACDA, to 16WS (CC), "CAC Staff Weather Officer Activities Report, January 1976," 5Feb76, included within Sup Doc #10 to "History of the 16th Weather Squadron," Jan-Jun76.

¹⁶Ltr Lt Col Owens to 16WS (CC), "Unit Activity Letter (March 1976)," 6Apr76, included within Sup Doc #9 to "History of the 16th Weather Squadron," Jan-Jun76, itself included as Appendix 5 in Vol 2 of "History of the 5th Weather Wing," Jan-Jun76.

¹⁷Ltr Lt Col Owen Y. Macy, staff weather officer to USAICS, to 16WS (CC), "Unit Report - August," 10Sep76, included within Sup Doc #14 of "History of the 16th Weather Squadron," Jul-Sep76, itself included as Appendix 5 in Vol 2 of "History of the 5th Weather Wing," Jul-Dec76.

¹⁸Ltr Lt Col Macy to OL-C 5WW, "Unit Information Report," 7Mar77, included within Sup Doc #10 to "History of OL-A, C, and E, 5th Weather Wing," Jan-Jun77, itself included as Appendix 1 in Vol 1 of "History of the 5th Weather Wing," Jan-Jun77.

¹⁹Ltr Lt Col Macy to OL-C 5WW, "Unit Information Report," 2Nov77, included within Sup Doc #9 to "History of OL-A, C, and E, 5th Weather Wing," Jul-Dec77, itself included as Appendix 2 in Vol 1 of "History of the 5th Weather Wing," Jul-Dec77.

²⁰"History of the 5th Weather Squadron," Jul-Dec76, pp. 13-14, included as Appendix 4 in Vol 2 of "History of the 5th Weather Wing," Jul-Dec76; and "History of the 5th Weather Squadron," Jul-Dec77, p. 7, included as Appendix 7 in Vol 2 of "History of the 5th Weather Wing," Jul-Dec77.

CHAPTER 7 - DIVISION SUPPORT: DIRECT OR INDIRECT?

¹Background paper Col Robert M. Chamberlain, DCS Ops, HQ AWS, "Army Weather Support Concepts," 30Oct75, included within Sup Doc #47 in Vol II, "Supporting Documents," of *History of Air Weather Service*, 1Jul74-31Dec75 (S). Info used (U).

²See: ltr Maj McDonald to 16WS (CC), "CACDA Staff Weather Officer Activities Report, August 1974," 6Sep74, included within Appendix 11 to "History of the 16th Weather Squadron," Jul-Dec74, itself included as Appendix 5 in Vol 2 of "History of the 5th Weather Wing," Jul-Dec74; Ltr Maj McDonald to 16WS (CC), "CACDA Staff Weather Officer Activities Report, November 1974," 11Dec74, included within Appendix 11 to "History of the 16th Weather Squadron," Jul-Dec74.

³Ltr Lt Col Joseph W. Martin, Jr, ops off, 16WS, to 5WW (DOX), "MASSTER Test FM 286," 18Feb75, included as Sup Doc #7 to "History of the 16th Weather Squadron," Jan-Jun75, itself included as Appendix 7 in Vol 2 of "History of the 5th Weather Wing," Jan-Jun75.

⁴Ltr Maj McDonald to 16WS (CC), "End-of-Test Report on Weather Support Concept for MASSTER Test, FM 286, Division Command Post Test," 31Jan75, included as Sup Doc #53 in Vol 4 of "History of the 5th Weather Wing," Jan-Jun75.

⁵Ltr Maj McDonald to 16WS (CC), "CACDA Staff Weather Officer Activities Report, February 1975," 4Mar75, included within Sup Doc #40 to "History of the 16th Weather Squadron," Jan-Jun75, itself included as Appendix 7 in Vol 2 of "History of the 5th Weather Wing," Jan-Jun75.

⁶Ltr Maj McDonald to 16WS (CC), "CACDA Staff Weather Officer Activities Report, March 1975," 4Apr75, included within Sup Doc #40 of "History of the 16th Weather Squadron," Jan-Jun75.

⁷Ltr Maj McDonald to 16WS (CC), "CACDA Staff Weather Officer Activities Report, April 1975," 6May75, included within Sup Doc #40 of "History of the 16th Weather Squadron," Jan-Jun75, itself included as Appendix 7 in Vol 2 of "History of the 5th Weather Wing," Jan-Jun75.

⁸Ltr Maj McDonald to 16WS (CC), "CACDA Staff Weather Officer Activities Report, June 1975," 8Jul75, included within Sup Doc #40 of "History of the 16th Weather Squadron," Jan-Jun75.

⁹See: ltr and atch ("FM 286 Background Paper") Col Wesley E. Robb, ch, ops, div, 5WW, to AWS (DO), "Weather Support to DTOC Under the FM 286 Concepts," 28Aug75, included as Sup Doc #66 in Vol 3 of "History of the 5th Weather Wing," Jul-Dec75; ltr Maj McDonald to 16WS (CC), "CACDA Staff Weather Officer Activities Report, August 1975," 3Sep75, included within Sup Doc #39 of "History of the 16th Weather Squadron," Jul-Dec75, itself included as Appendix 7 in Vol 2 of "History of the 5th Weather Wing," Jul-Dec75.

¹⁰Ltr and 2 atch Col Cooke W. Leutwyler, Dir of Rqmts (AWS/DOQ), DCS Ops, HQ AWS, to 1WW (DO), *et al.*, "Tactical Weather Support Concept Conference, 15-17 Sep 75," 24Oct75, included as Sup Doc #68 in Vol 3 of "History of the 5th Weather Wing," Jul-Dec75.

¹¹Ltr Lt Col Joseph W. Martin, ops of, 16WS, to 5WW (CV and DO), "IAG Representative Information," 24Sep75, included as Sup Doc #32 in "History of the 16th Weather Squadron," Jul-Dec75, itself included as Appendix 7 in Vol 2 of "History of the 5th Weather Wing," Jul-Dec75.

¹²Ltr Lt Col James C. Owens, staff weather officer to USAICS, to 16WS (CC), "Unit Activity Letter (September 1975)," 15Oct75, included within Sup Doc #38 to "History of the 16th Weather Squadron," Jul-Dec75.

¹³Ltr Capt Frederick F. Haddad, Jr, asst plans off, 5WW, to 5WW (DO, CV, and CC), "5WW/AWS IAG Trip Report," 11Nov75, included as Sup Doc #67 in Vol 3 of "History of the 5th Weather Wing," Jul-Dec75.

¹⁴*Ibid.*

¹⁵*Ibid.*

¹⁶*Ibid.*

¹⁷*Ibid.*

¹⁸Ltr Lt Col Joseph W. Martin, Jr, ops off, 16WS, to 5WW (CC), "Unit Activity Report/Atch 1," 20Oct75, included within Sup Doc #37 to "History of the 16th Weather Squadron," Jul-Dec75, itself included as Appendix 7 in Vol 2 of "History of the 5th Weather Wing," Jul-Dec75.

¹⁹Ltr Lt Col Martin to 5WW (DO), "Division OWT Location," 31Oct75, included as Sup Doc #91 to "History of the 16th Weather Squadron," Jul-Dec75.

²⁰Ltr Col Wesley E. Robb, ch, ops div, 5WW, to 16WS (DO), "OWT Location (Your Ltr, 31 Oct 75)," 19Dec75, included as Sup Doc #42 to "History of the 16th Weather Squadron," Jul-Dec75. See also Col Walter R. Brett, comdr, 16WS, "Fact Sheet," 2Jan76, included as Sup Doc #2 to "History of the 16th Weather Squadron," Jan-Jun76, itself included as Appendix 5 in Vol 2 of "History of the 5th Weather Wing," Jan-Jun76.

²¹Ltr McDonald to 16WS (CC), "CAC Staff Weather Officer Activities Report, October 1975," 6Nov75, included within Sup Doc #39 of "History of the 16th Weather Squadron," Jul-Dec75, itself included as Appendix 7 in Vol 2 of "History of the 5th Weather Wing," Jul-Dec75.

²²See: point paper, Col Anthony P. Simkus (acting dir, C&C Directorate, CACDA) to CACDA (dep comdr), "Trip Report: Third JWG Weather . . .," 28Jan76, atch to ltr McDonald to 16WS (CC), "CAC Staff Weather Officer Activities Report, January 1976," 5Feb76, included within Sup Doc #10 to "History of the 16th Weather Squadron," Jan-Jun76, itself included as Appendix 5 in Vol 2 of "History of the 5th Weather Wing," Jan-Jun76; and "Minutes of the Third Joint Working Group (JWG) for Weather Support to the US Army, Fort Huachuca, AZ 20-21 Jan 76," included as Sup Doc #75 in Vol 3 of "History of the 5th Weather Wing," Jan-Jun76.

²³Ltr Col Walter R. Brett, comdr, 16WS, to TRADOC (DCSCD), "Division Weather Support," 2Jan76, included as Sup Doc #1 to "History of the 16th Weather Squadron," Jan-Jun76.

²⁴Ltr and atch "(Division Weather Support)" Lt Col Joseph W. Martin, Jr, ops off, 16WS, to 5WW (DO), "COMAC Information Papers," 8Dec75, included as Sup Doc #24 to "History of the 16th Weather Squadron," Jul-Dec75.

²⁵See p. 19 herein.

²⁶"History of the 16th Weather Squadron," Jan-Jun76, pp. 3-4.

²⁷See: ltr Lt Col James C. Owens, staff weather officer to USAICS, to 16WS (CC), "Unit Activity Letter (January 1976)," 10Feb76, included within Sup Doc #8 of "History of the 16th Weather Squadron," Jan-Jun76, itself included as Appendix 5 in Vol 2 of "History of the 5th Weather Wing," Jan-Jun76; ltr Lt Col Joseph W. Martin, Jr, ops off, 16WS, to 5WW (CC), "Unit Information Report, RCS: 5WW/DO(M)7203," 12Mar76, included within Sup Doc #11 of "History of the 16th Weather Squadron," Jan-Jun76.

²⁸See: ltr Lt Col Macy, OL-A 5WW, to OL-C 5WW, "Unit Information Report (RCS: 5WW-DO (M) 7203)," 7Mar77; ltr Macy to OL-C 5WW, "Unit Information Report (RCS: 5WW-DO (M) 7203)," 6Apr77; and ltr Macy to OL-C 5WW, "Unit Information Report (RCS: 5WW-DO (M) 7203)," 30Jun77, all included within Sup Doc #10 to "History of OL-A, C, and E, 5th Weather Wing," Jan-Jun77, itself included as Appendix 2 in Vol 1 of "History of the 5th Weather Wing," Jan-Jun77; and ltr Lt Col Darrell T. Holland, OL-E 5WW, to OL-C 5WW, "Unit Information Report - July 1977," 4Aug77, included within Sup Doc #11 to "History of OL-A, C, and E, 5th Weather Wing," Jul-Dec77, itself included as Appendix 2 in Vol 1 of "History of the 5th Weather Wing," Jul-Dec77.

²⁹Ltr Col Norman S. Wells, Directorate of Intelligence Systems (DAMI-TST), Dept of the Army, to HQ USAF (XOOTF), "Direct Weather Service Support to Army Units Below Division," 26Jan79, included as Sup Doc #10 in Vol II, "Supporting Documents," of this study.

CHAPTER 8 - ARMY REQUIREMENTS

¹Army Regulation 115-12, "US Army Requirements for Weather Service Support," 12Feb70. The scope of that regulation was expanded in a 1Dec77 revision to include the submission of SORs by Army National Guard and Reserve units.

²Ltr and 2 atch Col Cooke W. Leutwyler, Dir of Rqmts (AWS/DOQ), DCS Ops, AWS, to 1WW (DO), *et al.*, "Tactical Weather Support Concept Conference, 15-17 Sep 75," 24Oct75, included as Sup Doc #68 in Vol 3 of "History of the 5th Weather Wing," Jul-Dec75.

³See: "History of the Assistant for Weather, DCS Programs & Resources, Headquarters, USAF," Jan-Jun76, p. 19; "History of the 16th Weather Squadron," Jul-Sep76, p. 5, included as Appendix 5 in Vol 2 of "History of the 5th Weather Wing," Jul-Dec76; and background paper, Maj Gen John W. Collens, DCS Plans, HQ MAC, "Processing of US Army Statement of Requirements (SOR) for Direct Weather Service Support," 18Jan77.

⁴Fuller, "Text of Interview With Brigadier General William H. Best, Jr, (Commander of Air Weather Service)," 19-20Jun73, pp. 34-39, included as Sup Doc #1 in Vol II, "Supporting Documents," of "History of Air Weather Service," 1Jul72-30Jun74 (S). Info used (U).

⁵In March 1975, the 16WS operations officer wrote that "Army weather requirements . . . [in] SORs . . . are still basically prepared by Air Force weather personnel." See ltr Lt Col Joseph W. Martin, Jr, ops off, 16WS, to 5WW (DO), "Reevaluation of Stating Army Weather Support Capabilities/Requirements," 4Mar75, included as Sup Doc #10 in "History of the 16th Weather Squadron," Jan-Jun75, itself included as Appendix 7 in Vol 2 of "History of the 5th Weather Wing," Jan-Jun75.

⁶Rowe Interview: *Army Weather Support*, pp. 5-10, included as Sup Doc #4 in Vol II, "Supporting Documents," of this history.

⁷See: background paper Maj John G. Cates, Dir of Programs & Long Range Planning (AWS/XPX), DCS Plans, HQ AWS, "Candidate Capability Problem," 23Oct70; DCS Ops, HQ AWS, "Semiannual Report of Activities,"

⁷(Cont) Jan-Jun70, included as Tab 9 in Vol IV, "Supplements," of "History of Air Weather Service," 1Jul69-30Jun70 (S). Info used (U); "History of the 5th Weather Wing," 1Apr-30Jun70, p. 14; "History of the 16th Weather Squadron," 1Apr-30Jun70, p. 6B; HQ 5WW, *Activities Report on US Army Weather Support, 1 Apr - 30 Jun 70*, (FOUO), 15Jul70, p. 1, included as Sup Doc #2 to "History of the 5th Weather Wing," 1Apr-30Jun70; and HQ 5WW, *Activities Report on US Army Weather Support, 1Jan-31Mar72* (FOUO), p. 1, included as Sup Doc #62 in Vol III of "History of the 5th Weather Wing," Jan-Jun72.

⁸See: fact sheet, "Tactical Environmental Support System (TESS) Study, ACN 18284," 16Nov73, included as Sup Doc #11 in "History of the 16th Weather Squadron," Jul-Dec73, itself included as Appendix E in Vol 1 of "History of the 5th Weather Wing," Jul-Dec73; and HQ 5WW, *Activities Report on US Army Weather Support, 10Oct-31Dec71* (FOUO), 14Jan72, p. 3, included as Sup Doc #20 to "History of the 5th Weather Wing," Jul-Dec71.

⁹HQ TAC *Activities Report on Tactical Weather Systems/Equipment, 1Apr-30Jun74* (FOUO), 15Jul74, p. 1, included as Sup Doc #45 in Vol 4 of "History of the 5th Weather Wing," Jan-Jun74.

¹⁰See coordination draft of Vol 1, *Executive Summary*, of USAICS, TRADOC, U.S. Army, *Tactical Environmental Support System (TESS) Study*, ACN 18284, Aug74, included as Appendix 4 to "History of the 16th Weather Squadron," Jul-Dec74, itself included as Appendix 5 in Vol 2 of "History of the 5th Weather Wing," Jul-Dec74.

¹¹Ltr Owens to Dep Commandant for Combat and Trng Development, USAICS, "Trip Report - LtC Owens and Maj Miller," 16Aug74, included within Appendix 10 to "History of the 16th Weather Squadron," Jul-Dec74.

¹²Ltr McDonald to 16WS (CC), "CACDA Staff Weather Officer Activities Report, September 1974," 10Oct74, included within Appendix 11 to "History of the 16th Weather Squadron," Jul-Dec74.

¹³Ltr McDonald to 16WS (CC), "CACDA Staff Weather Officer Activities Report, May 1975," 10Jun75, included within Sup Doc #40 to "History of the 16th Weather Squadron," Jan-Jun75, itself included as Appendix 7 in Vol 2 of "History of the 5th Weather Wing," Jan-Jun75.

¹⁴Ltr Lt Col Joseph W. Martin, Jr, ops off, 16WS, to 5WW (CC), "Unit Information Report, RCS: 5WW-DO(M) 7203," 12Sep75, included within Sup Doc #37 to "History of the 16th Weather Squadron," Jul-Dec75, itself included as Appendix 7 in Vol 2 of "History of the 5th Weather Wing," Jul-Dec75.

¹⁵"History of the 5th Weather Wing," Jul-Dec75, p. 20. See also: ltr Lt Col Joseph W. Martin, Jr, ops off, 16WS, to 5WW (DO), "Tactical Environmental Support System (TESS) Study Approved," 8Oct75, included as Sup Doc #16 to "History of the 16th Weather Squadron," Jul-Dec75; fact sheet, "Tactical Environmental Support System (TESS) Study, ACN 18284M," 11May76, included within Sup Doc #9 of "History of the 16th Weather Squadron," Jan-Jun76, itself included as Appendix 5 in Vol 2 of "History of the 5th Weather Wing," Jan-Jun76.

¹⁶Ltr Lt Col Martin to 5WW (CC), "Unit Information Report, RCS: 5WW-DO(M)7203," 28Nov75, included within Sup Doc #37 to "History of the 16th Weather Squadron," Jul-Dec75.

¹⁷Ltr Lt Col James C. Owens, staff weather officer to USAICS, to 16WS (CC), "Unit Activity Letter (March 1976)," 6Apr76, included within Sup Doc #9 to "History of the 16th Weather Squadron," Jan-Jun76; ltr Maj McDonald, staff weather officer to CACDA, to 16WS (CC), "CAC Staff Weather Officer Activities Report, March 1976," 5Apr76, included within Sup Doc #10 to "History of the 16th Weather Squadron," Jan-Jun76.

¹⁸Ltr Lt Col Martin to 5WW (DOX), "MAP/SAMSR," 8Apr76, included as Sup Doc #6 to "History of the 16th Weather Squadron," Jan-Jun76.

¹⁹Ltr McDonald to 16WS (CC) "CAC Staff Weather Officer Activities Report, June 1976," 6Jul76, included within Sup Doc #10 of "History of the 16th Weather Squadron," Jan-Jun76.

²⁰See Vol 1, *Executive Summary*, Mar76, and Vol 2, *Main Report* (C), Feb76, of USAICS, TRADOC, Dept of the Army, *Tactical Environmental Support System (TESS) Study*, ACN 18284. Info used (U). The *Executive Summary* is included as Sup Doc #11 in Vol II, "Supporting Documents," of this history.

²¹Ltr and atch (TRADOC's draft MAP/SAMSR) Lt Col J. M. Larkins, asst adjutant gen, TRADOC, to HQ Dept of the Army (DAMO-RQ, *et al.*), *et al.*, "Joint Army/Air Force Master Plan for the Satisfaction of Army Meteorological Support Requirements (MAP/SAMSR), USATRADOC ACN 24546," 30Aug77, included as Sup Doc #12 in Vol II, "Supporting Documents," of this history.

²²Ltr and 2 atch (AWS' proposed rewrite of MAP/SAMSR, and "Additional Proposals,") Col Salvatore R. LeMole, DCS Ops, HQ AWS, to MAC/XPPE, "Joint Army/Air Force Master Plan for the Satisfaction of Army Meteorological Support Requirements (MAP/SAMSR), USATRADOC ACN 24546," 15Nov77, included as Atch 2 to Readiness Div (AWS/DOQP), Directorate of Rqmts, DCS Ops, HQ AWS, "Semiannual Report of Activities," Jul-Dec77, itself included within the "Supplements" volumes to the *History of Air Weather Service*, 1977.

²³Ltr Col John D. Sims, Director, Programming and Policy (MAC/-XPP), DCS Plans, HQ MAC, to HQ USATRADOC (ATCD-SE), "Joint Army/Air Force Master Plan for Satisfaction of Army Meteorological Support Requirements (MAP/SAMSR), USATRADOC ACN 24546," 20Jan78, included as Sup Doc #11 to "History of OL-A, C, and E, 5th Weather Wing," Jan-Jun78, itself included as Appendix 2 in Vol 1 of "History of the 5th Weather Wing," Jan-Jun78.

²⁴Ltr Lt Col J. M. Larkins, asst adjutant general (ATCD-IE-R), TRADOC, to Dept of the Army (DAMI-RO), "Master Plan for the Satisfaction of Army Meteorological Support Requirements (MAP/SAMSR), USATRADOC ACN 24546)," 23Jan78, included as Sup Doc #12 to "History of OL-A, C, and E, 5th Weather Wing," Jan-Jun78.

²⁵Ltr Lt Col Darrell T. Holland, staff weather officer to CACDA, to 16WS (CC), "Critique of Allied Officer Preparatory Course," 24Aug76, included as Sup Doc #6 to "History of the 16th Weather Squadron," Jul-Sep76, itself included as Appendix 5 in Vol 2 of "History of the 5th Weather Wing," Jul-Dec76.

- ²⁶Msg CAC (ATCA-CFC (B)) to TRADOC (ATCD-SIE), *et al.*, info AFGL and ESD, "Army Tactical Commander's Weather Requirements Conference," 020144ZAug77.
- ²⁷Ltr and 10 atch Capt Roger A. Schjeldahl, asst adjutant gen, CAC, to Dept of the Army (DAMI-TST-I), *et al.* "Army Tactical Commander's Weather Requirements Conference," 20Sep77, included as Sup Doc #28 in Vol 3 of "History of the 5th Weather Wing," Jul-Dec77.
- ²⁸*Ibid.*
- ²⁹*Ibid.*
- ³⁰Ltr Capt Schjeldahl to CINCUSAREUR, *et al.*, "Tactical Requirements for Weather Support," 25Nov77, included as Sup Doc #10 to "History of OL-A, C, and E, 5th Weather Wing," Jan-Jun78, itself included as Appendix 2 in Vol 1 of "History of the 5th Weather Wing," Jan-Jun78.
- ³¹Ltr Holland to OL-C 5WW, "Unit Information Report - August 1977," 2Sep77, and ltr Holland to OL-C 5WW, "Unit Information Report - November 1977," 7Dec77, both included within Sup Doc #11 to "History of OL-A, C, and E, 5th Weather Wing," Jul-Dec77, itself included as Appendix 2 in Vol 1 of "History of the 5th Weather Wing," Jul-Dec77.
- ³²Ltr Lt Col Holland to OL-C 5WW, "Unit Information Report - February 1978," 6Mar78, and ltr Holland to OL-C 5WW, "Unit Information Report - May 1978," 6Jun78--included as Sup Docs #19-2 and 19-9, respectively, to "History of OL-A, C, and E, 5th Weather Wing," Jan-Jun78, itself included as Appendix 2 in Vol 1 of "History of the 5th Weather Wing," Jan-Jun78; ltr Holland to OL-C 5WW, "Unit Information Report - August 1978," 1Sep78, ltr Holland to OL-C 5WW, "Unit Information Report - October 1978," 6Nov78, and ltr Holland to OL-C 5WW, "Unit Information Report - December 1978," 8Jan79--included as Sup Docs 3-1, 3-3, and 3-5, respectively, in "History of OL-A, C, and E, 5th Weather Wing," Jul-Dec78, itself included as Appendix 2 in Vol 1 of "History of the 5th Weather Wing," Jul-Dec78.
- ³³Ltr Swayne to Mr. Beck, Dept of the Army (DAMI-TST-I), "Army Weather Support," 22Dec77, included as Sup Doc #6 in Vol II, "Supporting Documents," of this study.
- ³⁴"AWS Support Evaluation of USAREUR Weather Requirements," n.d. (*circa* May78), included as Atch 4 to Readiness Div (AWS/DOQX), Directorate of Rqmts, DCS Ops, HQ AWS, "Semiannual Report of Activities," Jul-Dec78, itself included within the "Supplements" volumes to *History of Air Weather Service*, 1978.
- ³⁵Ltr and 2 atch Swayne to TRADOC (AFTE-2), "Liaison Activities (RCS AFTE-2)," 10Oct78.
- ³⁶Ltr Swayne to TRADOC (AFTE), "Liaison Activities (RCS AFTE-2)," 1Mar79.
- ³⁷Msg Dept of the Army (DAPE-GO) to AIG 7405, *et al.*, "General Officer Announcements," 161600ZApr79.
- ³⁸Vol I, p. 6, of "History of the 5th Weather Wing," Jan-Jun75.

- ³⁹ Ltr Col Cooke H. Leutwyler, Dir of Rqmts (AWS/DOQ), DCS Ops, HQ AWS, to MAC (XPMRZ), "US Army Requirements for Direct Weather Service Support (Fort Knox KY and Fort Indiantown Gap PA)," 5Jan76.
- ⁴⁰ Ltr Col William E. Harris, dep dir, Programming & Policy (MAC/XPP), DCS Plans, HQ MAC, to HQ USAF (PRW), "AWS Support to Army Reserve (ARes) and Army National Guard (NG) - Army Reserve Components," 16Jan76.
- ⁴¹ Vol I, *Narrative*, pp. 1-16, of *History of Air Weather Service*, 1976 (S). Info used (U).
- ⁴² Ltr Col Cummins, AF/PRW, to Dept of the Army (DAMI-TSI), "Direct Weather Support Requirements (Muir AAF, PA)," 9Apr76.
- ⁴³ Memo Carlton to Rowe, 21May76.
- ⁴⁴ Vol I, *Narrative*, pp. 72-73, of *History of Air Weather Service*, 1976 (S). Info used (U).
- ⁴⁵ *Ibid.*, 73-74.
- ⁴⁶ Ltr Col James S. Kennedy, asst DCS Ops, HQ AWS, to MAC (XPPE), "TIG Functional Management Inspection of Weather Support for Reserve Units, 14Jul75-30Apr76, PN 76-603," 22Nov76.
- ⁴⁷ Memo for record, Maj John J. Kelly, Environmental Svcs Div (MAC/XPPE), Directorate of Programming and Policy, DCS Plans, HQ MAC, "Visit to HQ USAF/PRW," 15Feb77.
- ⁴⁸ Ltr and atch (position paper, "AWS Army Reserve Component--ARC--Support Policy," with 1 atch, "AWS Position") Col Norman F. Rauscher, asst DCS Ops, HQ AWS, to LWW (DO), *et al.*, "AWS Army Reserve Component (ARC) Support Policy," 10Nov77, included as Sup Doc #13 in Vol II, "Supporting Documents," of this study.
- ⁴⁹ *Ibid.*
- ⁵⁰ Col Ramon C. Wilkins, chairman, AWS Council, report of 12 and 14Dec77 mtg, "Review and Document Policy on Army Reserve Component Weather Support," with 2 atch: "AWS Position on Army Reserve Component (ARC) Support," and "Estimated Cost of Implementing AWS Policy on ARC Support." This report, together with others addressing the AWS Council and Program Review Committee meetings of 1977, are included together as Sup Doc #4 in Vol II, "Supporting Documents," of *History of Air Weather Service*, 1977.
- ⁵¹ Ltr without atch (see *ibid.*) Col Salvatore R. LeMole, DCS Ops, HQ AWS, to MAC (XPP), "Weather Support to Army Reserve Component (ARC)," 5Jan78.
- ⁵² See: msg Hall to Collens, "Weather Services to Muir Army Airfield," 091400ZMay78; msg Collens to Hall, "Weather Services to Muir Army Airfield," 232330ZMay78; ltr Hall to Collens, 9Jun78; and ltr Brig Gen Rowe to MAC (XPPE), "Weather Service to Muir AAF," 14Jul78.
- ⁵³ At the same time MAC and AWS were processing the Muir SOR, they were also deliberating over an SOR for Fort Drum, New York--

⁵³ (Cont) which, while an active duty FORSCOM post, principally served Army reserve components. There too, active duty AWS personnel were assigned in 1978, and the additional manpower spaces were provided by the Air Staff. See: Vol 1, "History of the 3d Weather Wing," Jan-Jun77, pp. 22-23; Vol 1, "History of the 3d Weather Wing," Jul-Dec77, pp. 26-27; and Vol 1, "History of the 3d Weather Wing," Jan-Jun78, pp. 26-27.

⁵⁴ Ltr Col LeMole, vice comdr, AWS, to MAC (XPPE), "Weather Service to Muir AAF," 13Oct78.

⁵⁵ Directorate of Trng (AWS/DOT), DCS Ops, HQ AWS, "Report of Activities," Jul-Dec78, pp. 2-3; Readiness Div (AWS/DOQP), Directorate of Rqmts, DCS Ops, HQ AWS, "Semiannual Report of Activities," Jan-Jun78, pp. 4-5, and Jul-Dec78, pp. 2-3--each document included within the "Supplements" volumes to *History of Air Weather Service*, 1978.

⁵⁶ Directorate of Tng (AWS/DOT), DCS Ops, HQ AWS, "Report of Activities," Jan-Jun78, p. 3, included within the "Supplements" volumes to *History of Air Weather Service*, 1978.

⁵⁷ Ltr Col Walter R. Brett, staff weather officer to TRADOC, to 5WW (CC), "Unit Activity Report (RCS: 5WW/DOO (M) 7203)," 11Jan77, included within Sup Doc #9 to "History of the 16th Weather Squadron," Jul-Dec76.

⁵⁸ Ltr Maj Charles A. Diaz, asst staff weather officer to TRADOC, to 5WW (CC), "Unit Information Report - August," 14Sep77, included within Sup Doc #10 to "History of OL-A, C, and E, 5th Weather Wing," Jul-Dec77, itself included as Appendix 2 in Vol 1 of "History of the 5th Weather Wing," Jul-Dec77.

⁵⁹ Ltr Lt Col Holland, staff weather officer to CACDA, to OL-C 5WW, "Unit Information Report - August 1977," 2Sep77, included within Sup Doc #11 to "History of OL-A, C, and E, 5th Weather Wing," Jul-Dec77.

⁶⁰ Ltr Maj Diaz, asst staff weather officer to TRADOC, to 5WW (CC), "Unit Information Report - April 1978," 15May78, included as Sup Doc #18-6 to "History of OL-A, C, and E, 5th Weather Wing," Jan-Jun78, itself included as Appendix 2 in Vol 1 of "History of the 5th Weather Wing," Jan-Jun78. See also: ltr Lt Col Macy, staff weather officer to USAICS, to OL-C 5WW, "Unit Information Report (RCS: 5WW DO(M) 7203)," 1Sep78; ltr Macy to OL-C 5WW, "Unit Information Report (RCS: 5WW DO(M) 7203)," 6Dec78; and ltr Col Cummins, staff weather officer to TRADOC, to 5WW (CC), "Unit Information Report - October 1978," 17Nov78--included as Sup Docs #1-1, 1-4, and 2-3, respectively, to "History of OL-A, C, and E, 5th Weather Wing," Jul-Dec78, itself included as Appendix 2 in Vol 1 of "History of the 5th Weather Wing," Jul-Dec78.

⁶¹ Msg TRADOC (ATCH-SIE) to Heersamp (US Verbofez), Cologne, info Dept of Army (DAMI-FLA and DAMT-TSI), *et al.*, "Weather Service Interoperability," 031919ZJun76, included as Sup Doc #79 in Vol 3 of "History of the 5th Weather Wing," Jan-Jun76.

⁶² See "AWS NATO Policy Implementation," attached to rpt, Col Ramon C. Wilkins, chairman, AWS Council, "Report of HQ AWS Council

⁶²(Cont) Meeting," 12Jul78, included as Atch 2 to Readiness Div (AWS/DOQP), Directorate of Rqmts, DCS Ops, HQ AWS, "Semi-annual Report of Activities," Jul-Dec78, itself included within the "Supplements" volumes to *History of Air Weather Service*, 1978.

⁶³AR 115-10/AFR 105-3, "Environmental Services: Meteorological Support for the U.S. Army," 9Jun70, pp. 1-1 and 1-2.

⁶⁴Rowe Interview: *Army Weather Support*, pp. 1-21, included as Sup Doc #4 in Vol II, "Supporting Documents," of this history.

⁶⁵Ltr Maj Gen R. H. Groves, ch of staff, USAREUR, to HQ Dept of the Army (DAMI-TST-I), *et al.*, "Forward Area Limited Observing Program (FALOP)," 29Nov76, included as Sup Doc #14 in Vol II, "Support Documents," of this history.

⁶⁶Ltr Rowe to CINCUSAREUR, "Forward Area Limited Observing Program (USAREUR Reg 381-2)," 1Jul77.

⁶⁷Ltr Rowe to HQ USAF (PRW), "Forward Area Limited Observation Program (USAREUR Ltr, 29 Nov 76)," 20Jan77, included as Sup Doc #15 in Vol II, "Supporting Documents," of this study.

⁶⁸Ltr and atch (staff study rpt, Col Brett, "Army-Wide Forward Area Limited Observation Program--FALOP) Col Brett, staff weather officer to TRADOC, to 5WW (DO), "Army-Wide Forward Area Limited Observation Program (FALOP)," 12Jun78, included as Sup Doc #8 to "History of OL-A, C, and E, 5th Weather Wing," Jan-Jun78, itself included as Appendix 2 in Vol 1 of "History of 5th Weather Wing," Jan-Jun78.

⁶⁹Ltr Col Cummins, staff weather officer to TRADOC, to 5WW (CC), "Unit Information Report - September 1978," 15Oct78, included as Sup Doc #2-2 to "History of OL-A, C, and E, 5th Weather Wing," Jul-Dec78, itself included as Appendix 2 in Vol 1 of "History of the 5th Weather Wing," Jul-Dec78.

⁷⁰Msg 30WS (DON) to 1WW (DO), Det 15 30WS, and Det 10 30WS, info AWS (DO), *et al.*, "FALOP Implementation," 160709ZMay78.

⁷¹"Post Exercise Critique: REFORGER 77," n.d., included as atch to "History of the 7th Weather Squadron," Jul-Dec77, itself included as Appendix 2 to "History of the 2d Weather Wing," Jul-Dec77.

⁷²Msg 2WW (DO) to AWS (DO), "AWS Army Support Policy," 281425Z-Nov77; ltr Mr. Warren K. Mahoney, Dir, Comm Rqmts (AWS/SYC), DCS Systems, HQ AWS, to HQ AWS (DOU), "AWS Standardized FALOP Code," 31Oct78.

CHAPTER 9 - CONCEPTS, POLICY, AND DOCTRINE

¹Fuller, "Text of Interview With Brigadier General William H. Best, Jr (Commander of Air Weather Service," 19-20Jun73, p. 37, included as Sup Doc #1 in Vol II, "Supporting Documents," of "History of Air Weather Service," 1Jul72-30Jun74 (S). Info used (U).

- ²*Ibid.*
- ³Vol I, "Narrative," p.332, of "History of Air Weather Service," 1Jul70-30Jun71.
- ⁴Telephone interview by author with Cummins on 19-20Jun78, and personal discussion by author with Cummins on 22-23Jun78.
- ⁵*Rowe Interview: Army Weather Support*, pp. 32-34, included as Sup Doc #4 in Vol II, "Supporting Documents," of this study.
- ⁶Ltr Lt Col Thomas W. Fuller, Ch, Tac Intel Div (DAMI-TST), Dir of Tac/Strat Intel, Dept of the Army, to FORSCOM (AFIN-R), *et al.*, info HQ USAF (PRW), MAC (XPPE), and AWS (DO), "Review of Requirements for Direct Weather Service Support (AR 115-12)," 30Nov76.
- ⁷Ltr Lt Col Fuller, Dept of the Army (DAMI-TST), to HQ USAF (PRW), "US Army Requirements for Direct Weather Service Support," 18Feb77.
- ⁸Ltr Col Cummins, AF/PRW, to MAC (XPMRZ), "US Army Requirements for Direct Weather Service Support," 28Feb77.
- ⁹*Rowe Interview: Army Weather Support*, pp. 31-32.
- ¹⁰Vol I, "Narrative," p. iv, of "History of Air Weather Service," 1Jul72-30Jun74 (S). Info used (U).
- ¹¹*Ibid.*, pp. 252-73, and Vol I, *Narrative*, pp. 8-9, of *History of Air Weather Service*, Jul74-31Dec75 (S). Info used (U).
- ¹²Vol I, "Narrative," p. 226, of "History of Air Weather Service," 1Jul72-30Jun74 (S). Info used (U).
- ¹³Memo for record, Maj John J. Kelly, Environmental Svcs Div (MAC/XPPE), Directorate of Programming and Policy, DCS Plans, HQ MAC, "Visit to HQ USAF/PRW," 15Feb77. See also memo Lt Col Richard A. Rinaldi, MAC/XPPE, to MAC (XPP), "Visit to USAF/PRW, 7-9Feb77," 15Feb77.
- ¹⁴HQ 5WW, *Activities Report on US Army Weather Support, 1 Jan-31 Mar 1971* (FOUO), 15Apr71, p. 1, included as Sup Doc #4 to "History of the 5th Weather Wing," Jan-Mar71.
- ¹⁵Fuller, "Text of Interview With Brigadier General William H. Best, Jr (Commander of Air Weather Service," 19-20Jun73, p. 36, included as Sup Doc #1 in Vol II, "Supporting Documents," of "History of Air Weather Service," 1Jul72-30Jun74 (S). Info used (U).
- ¹⁶Vol I, "Narrative," pp. 127, 137, of "History of Air Weather Service," 1Jul72-30Jun74 (S). Info used (U).
- ¹⁷Conversation by author with Rowe on 26 and 28Jun78.
- ¹⁸Point paper Col Rauscher, asst DCS Ops, HQ AWS, "AWS Manpower/-Manning (AWS/CC Testimony on H.R. 8762)," 22May78.
- ¹⁹*Rowe Interview: Army Weather Support*, pp. 22-23.

- ²⁰*Ibid.*, 1-2
- ²¹*Ibid.*, 23-24.
- ²²Text of "5WW Briefing - Army Support Conference," pp. 1, 13, included as Sup Doc #6 in "History of the 5th Weather Wing," Jan-Mar71.
- ²³"History of the 16th Weather Squadron," Jul-Dec74, pp. 12-14, included as Appendix 5 in Vol 2 of "History of the 5th Weather Wing," Jul-Dec74.
- ²⁴Ltr and atch Zapinski to 16WS and OL-D 16WS, "U.S. Army Weather Support," 6Dec74, included as Sup Doc #51 in Vol 4 of "History of the 5th Weather Wing," Jul-Dec74.
- ²⁵Brochure, "5 Weather Wing Commander's Conference, 3-4 December 1974," included as Sup Doc #79 in *Ibid.*
- ²⁶Ltr and atch Col David L. Roberts, ch, ops div, 5WW, to 5WS (CC), *et al.*, "Army Weather Support - Where Are We 13Jun75," included as Sup Doc #56 in Vol 4 of "History of the 5th Weather Wing," Jan-Jun75.
- ²⁷Rowe Interview: *Army Weather Support*, pp. 34-35, included as Sup Doc #4 in Vol II, "Supporting Documents," of this study.
- ²⁸Ltr and 5 atch Col Roberts, ch, ops div, 5WW, to AWS (DO), "Tactical Weather Support Concept - A Status Report," 8Jul75, included as Sup Doc #57 in Vol 4 of "History of the 5th Weather Wing," Jan-Jun75.
- ²⁹Ltr and 2 atch Col Cooke W. Leutwyler, Dir of Rqmts (AWS/DOQ), DCS Ops, HQ AWS, to 1WW (DO), *et al.*, "Tactical Weather Support Concept Conference, 15-17 Sep 75," 24Oct75, included as Sup Doc #68 in Vol 3 of "History of the 5th Weather Wing," Jul-Dec75.
- ³⁰Text of briefing by Maj Carl H. Chesley, HQ AWS, "Tactical Weather Support," included as pages 97-102 within Sup Doc #47 in Vol II, "Supporting Documents," of *History of Air Weather Service*, 1Jul74-31Dec75, (S). Info used (U).
- ³¹Vol I, *Narrative*, pp. 322-23, of *History of Air Weather Service*, 1Jul74-31Dec75 (S). Info used (U).
- ³²See: AWSM 55-2, *Operations: Weather Support for Joint Force Operations*, 30Mar73; Change 1 to it dated 30Nov73; and Change 2, dated 28Jan74--included together as Sup Doc # 15 in Vol II, "Supporting Documents," of this study.
- ³³See: AWSR 55-2, "Operations: AWS Tactical Weather Support," 31Aug77; and Change 1 to it, dated 27Mar78--included together as Sup Doc #16 in Vol II, "Supporting Documents," of this study.
- ³⁴U.S., Congress, House, Subcommittee on Dept of Def of the Committee on Appropriations, *Hearings, Department of Defense Appropriations for 1972*, 92d Cong, 1st Sess, Pt 1, 1971, pp. 552-53.
- ³⁵Army Field Manual 100-5, *Operations*, 1Jul76.

36 Lawrence J. Kolb, *The Joint Chiefs of Staff: The First Twenty-five Years* (Bloomington, IN: Indiana University Press, 1976), pp. 47-49.

37 U.S., Congress, Senate, Subcommittee of the Committee on Appropriations, *Hearings, Department of Defense Appropriations for Fiscal 1979*, 95th Cong, 2d Sess, Pt 5, 1978, p. 540.

38 Army Field Manual 100-5, *Operations*, 1Jul76.

39 U.S., Congress, Senate, Subcommittee of the Committee on Appropriations, *Hearings, Department of Defense Appropriations for Fiscal 1979*, 95th Cong, 2d Sess, Pt 4, 1978, pp. 561, 565; and U.S., Congress, Senate, Subcommittee of the Committee on Appropriations, *Hearings, Department of Defense Appropriations for Fiscal 1978*, 95th Cong, 1st Sess, Pt 4, 1977, p. 55.

See also: Edgar Ulsamer, "The USSR's Military Shadow is Lengthening," *Air Force*, Vol 60, No 3 (Mar77), pp. 44-45; Ulsamer, "The Accelerating Momentum of Soviet Military Might," *Air Force*, Vol 61, No 3 (Mar78), pp. 34-41; "The United States and the Soviet Union," pp. 64-70, and "The Theater Balance Between NATO and the Warsaw Pact," pp. 111-16, in *Air Force*, Vol 61, No 12 (Dec78); Ulsamer, "World Hegemony Through Military Superiority," pp. 40-47, and William Schneider, Jr, "Trends in Soviet Frontal Aviation," pp. 76-81, in *Air Force*, Vol 62, No 3 (Mar79).

40 *Ibid*; U.S., Congress, Senate, Subcommittee of the Committee on Appropriations, *Hearings, Department of Defense Appropriations for Fiscal 1978* 95th Cong, 1st Sess, Pt 5, 1977, pp. 618-31, 663.

41 Ltr Col Walter R. Brett, OL-C 5WW, to 5WW (DN and DOXX), "The Importance of Smoke on the Modern Battlefield," 14Feb77.

42 Ltr Maj Dell V. McDonald, staff weather officer to CACDA, to 5WW comdr, "Recommended TOE Changes for Army Weather Support," 31Dec74, included within Sup Doc #11 to "History of the 16th Weather Squadron," Jul-Dec74, itself included as Appendix 5 in Vol 2 of "History of the 5th Weather Wing," Jul-Dec74.

43 "Minutes of the Third Joint Working Group (JWG) for Weather Support to the US Army, Fort Huachuca, AZ 20-21 Jan 76," included as Sup Doc #75 in Vol 3 of "History of the 5th Weather Wing," Jan-Jun76.

44 Ltr Lt Col Joseph W. Martin, Jr, ops off, 16WS, to OL-E 16WS, "Concept of Centralized Support for Tactical Army Forces," 14Jan76, included as Sup Doc #3 to "History of the 16th Weather Squadron," Jan-Jun76, itself included as Appendix 5 in Vol 2 of "History of the 5th Weather Wing," Jan-Jun76.

45 Army Field Manual 100-5, *Operations*, 1Jul76, on file in the AWS historical archives.

46 *Ibid.*, p. 7-4.

47 Dept of Army Form 2496, *Action Trip Report*, Maj Dell V. McDonald, staff weather officer to CACDA, to CACDA dep comdr, "Army/Air Force Weather Conference (20Feb74)," 25Feb74, included as Sup Doc #7 to "History of the 16th Weather Squadron," Jan-Jun74, itself included as Appendix 5 in Vol 2 of "History of the 5th Weather Wing," Jan-Jun74.

⁴⁸ Col Joseph D. Saccone, (Asst DCS Ops, HQ AWS) and Mr. John A. Lockerd (Technical Director, CACDA), "Minutes of the 1st Joint Working Group on Weather Support to the Army," n.d. (circa May74), included within Sup Doc #8 to "History of the 16th Weather Squadron," Jan-Jun74.

⁴⁹ "Minutes of the 2d Joint Working Group Weather Support to the Army, Langley AFB, VA 22-23Oct 74," included within Appendix 6 to "History of the 16th Weather Squadron," Jul-Dec74, itself included as Appendix 5 in Vol 2 of "History of the 5th Weather Wing," Jul-Dec74.

⁵⁰ See: Ltr and atch Maj McDonald, staff weather officer to CACDA, to 16WS (CC), "CACDA Staff Weather Officer Report, December 1974," 3Jan75, included within Sup Doc #40 to "History of the 16th Weather Squadron," Jan-Jun75, itself included as Appendix 7 in Vol 2 of "History of the 5th Weather Wing," Jan-Jun75; ltr Lt Col James C. Owens, staff weather officer to USAICS, to 16WS (CC), "Training Letters," 24Jun75, included as Sup Doc #31 to "History of the 16th Weather Squadron," Jan-Jun75.

⁵¹ Ltr Lt Col Joseph W. Martin, Jr, ops off, 16WS, to 5WW (CC), "Unit Information Report, RCS: 5 WW-DO(M)7203," 30Jan76, included within Sup Doc #11 to "History of the 16th Weather Squadron," Jan-Jun76, itself included as Appendix 5 in Vol 2 of "History of the 5th Weather Wing," Jan-Jun76.

⁵² See: "Minutes of the Third Joint Working Group (JWG) for Weather Support to the US Army, Fort Huachuca, AZ 20-21 Jan 76," included as Sup Doc #75 in Vol 3 of "History of the 5th Weather Wing," Jan-Jun76; point paper, Col Anthony P. Simkus (acting dir, C&C Directorate, CACDA) to CACDA (dep comdr), "Trip Report; Third JWG Weather . . .," 28Jan76, atch to ltr Maj McDonald to 16WS (CC), "CAC Staff Weather Officer Activities Report, January 1976," 5Feb76, included within Sup Doc #10 to "History of the 16th Weather Squadron," Jan-Jun76.

⁵³ A copy of AWSP 50-6, dated 11Aug76, is included as Sup Doc #89 in Vol III, "Supporting Documents," of *History of Air Weather Service*, 1976 (S). Info used (U).

⁵⁴ Vol I, *Narrative*, pp. 184-87 of *History of Air Weather Service*, 1976 (S). Info used (U).

⁵⁵ Directorate of Rqmts (AWS/DOQ), DCS Ops, HQ AWS, "Semiannual Report of Activities," Jul-Dec76, pp. 2, 7-8, included within Tab 2 in Vol IV of *ibid*.

⁵⁶ See: "Summary of REFORGER 76," and "Reforger 76 MSI Test Report," included as atchs to "History of the 7th Weather Squadron," Jul-Dec76, itself included as Appendix II to "History of the 2d Weather Wing," Jul-Dec76; Capt Thomas D. Accola, current ops off, 5WS, "Post REFORGER 76 Briefing of 101st ABD SWO," 20Oct76, included as Sup Doc #18 to "History of the 5th Weather Squadron," Jul-Dec76, itself included as Appendix 4 in Vol 2 of "History of the 5th Weather Wing," Jul-Dec76.

⁵⁷ "Post Exercise Critique: REFORGER 77," n.d., included as atch to "History of the 7th Weather Squadron," Jul-Dec77, itself included as Appendix 2 to "History of the 2d Weather Wing," Jul-Dec77.

⁵⁸Ltr Lt Col Peter J. Britos, ops officer, 7WS, to 2WW (DN), "REFORGER 78 Weather Impact Indicator (WII) Evaluation Program," 1Dec78, included as Sup Doc #6 to "History of the 7th Weather Squadron," Jul-Dec78, itself included as Appendix 2 to "History of the 2d Weather Wing," Jul-Dec78.

⁵⁹See: ltr Col Walter R. Brett, staff weather officer to TRADOC, to TRADOC (DCSORI and DCSCD), "Weather," 20Apr77, included as Sup Doc #8 to "History of OL-A, C, and E, 5th Weather Wing," Jan-Jun77, itself included as Appendix 2 in Vol I of "History of the 5th Weather Wing," Jan-Jun77; ltr Lt Col Owen Y. Macy, OL-A 5WW, to OL-C 5WW, "Unit Information Report (RCS: 5WW DO(M) 7203)," 6May77, included within Sup Doc #10 to "History of OL-A, C, and E, 5th Weather Wing," Jan-Jun77.

⁶⁰"History of the 16th Weather Squadron," 1Jul-30Sep76, p. 7, included as Appendix 5 in Vol 2 of "History of the 5th Weather Wing," Jul-Dec76.

⁶¹Capt Wilbur G. Hugli, one of the very few experts AWS had in 1978 on the subject of weather support to Special Forces in unconventional warfare, believed Rowe's policy reflected a basic lack of understanding of the capabilities, missions, and doctrine of Army and Air Force Special Forces. For his interesting and provocative assessment of the subject, see ltr Hugli to 7WS (DO), "Weather Support to Unconventional Warfare Forces," 18Jan78, included as Sup Doc #47 to "History of the 7th Weather Squadron," Jan-Jun78, itself included as Appendix 2 in "History of the 2d Weather Wing," Jan-Jun78.

⁶²Ltr and 2 atch Col John W. Reames, ch, ops div, 5WW, to HQ AWS (DO), "Concept for Unconventional Warfare/Special Operations Weather Support," 4Apr78, included as Sup Doc #72 in Vol 4 of "History of the 5th Weather Wing," Jan-Jun78.

⁶³Vol I, *Narrative*, pp. 325-26, of *History of Air Weather Service*, 1Jul74-31Dec75 (S) info used (U); Fuller, draft, *Keith R. Grimes, Special Operations Weatherman: An Oral Autobiography* (Scott AFB, IL: Office of MAC History, Mar78); "Special Weather Support," pp. 1-24 in Vol III of "History of the 1st Weather Wing," Jul-Dec72; "Special History for the Special Warfare Weather Team/Special Operations Weather Team, 10th Weather Squadron," and 52 related documents, included within Vol III of "History of the 1st Weather Wing," Jul-Dec73; and Fuller, *Air Weather Service, 1937-1977: An Illustrated Chronology* (Scott AFB, IL: Office of MAC History, Jul77), pp. 38-39.

⁶⁴Ltr Owens to 16WS (CC), "Unit Activity Letter (May 1976)," 2May76, included within Sup Doc #9 to "History of the 16th Weather Squadron," Jan-Jun76, itself included as Appendix 5 in Vol 2 of "History of the 5th Weather Wing," Jan-Jun76.

⁶⁵Background paper Col James S. Kennedy, asst DCS Ops, HQ AWS, "Meteorological Support for the US Army - AR 115-10/AFR 105-3," 29Jan76.

⁶⁶Msg 2WW (DOX) to AWS (DOQ), info 1WW (DO), *et al.*, "Tactical Weather Support Concepts," 091600ZSep75.

⁶⁷DoD, JCS Pub 2, *Unified Actions Armed Forces (UNAAF)*, (Wash DC: JCS, Oct74), (FOUO), pp. 108-09.

⁶⁸ DCS Ops, HQ AWS, "Semi-Annual Report of Activities," Jul-Dec71, included within Tab 6 in Vol VI, "Supplements," of "History of Air Weather Service," 1Jul71-30Jun72 (S). Info used (U).

⁶⁹ Ltr Col A. L. Galli, USAICS (ARSI-CTD-MS), to Dept of the Army (ACSI, *et al.*), "Prerevision Review of FM 31-3/AFM 105-4, Weather Support for Field Army Tactical Operations," 6Sep74.

⁷⁰ Ltr Col Mortimer F. Bennet, AF/PRW, to USAICS (ATSI-CTD-MS), "Prerevision of FM 31-3/AFM 105-4, Weather Support for Field Army Tactical Operations (Your Ltr, 6 Sep 1974)," 16Sep74.

⁷¹ Ltr Bennet to MAC (XPPE), "Prerevision of FM 31-3/AFM 105-4, Weather Support for Field Army Tactical Operations," 16Sep74.

⁷² See: ltr and atch (Comments on FM 31-3/AFM 105-4") Lt Col James W. Hall, Dir of Rqmts Validation (AWS/DOQ), DCS Ops, HQ AWS, to MAC (XPPE), "Prerevision of FM 31-3/AFM 105-4, Weather Support for Field Army Tactical Operations (Your Ltr, 19Sep74)," 13Nov74; ltr Col William E. Harris, Jr, Dep Dir of Programming and Policy (MAC/XPP), DCS Plans, HQ MAC, to HQ USAF (PRW), "Prerevision of FM 31-3/AFM 105-4, Weather Support for Field Army Tactical Operations (Your Ltr, 16Sep74)," 18Nov74; and ltr Col Bennet, AF/PRW, to USAICS (ATSI-CTD-MS), "Prerevision of FM 31-3/AFM 105-4, Weather Support for Field Army Tactical Operations (ATSI-CTD-MS Ltr, 6 Sep 1974)," 2Dec74--included together as Sup Doc #17 in Vol II, "Supporting Documents," of this study.

⁷³ Ltr Macy to OL-C 5WW, "Unit Information Report (RCS: 5WW-DO (M) 7203)," 7Mar77, and ltr Macy to OL-C 5WW, "Unit Information Report (RCS: 5WW-DO (M) 7203)," 30Jun77--both included within Sup Doc #10 to "History of OL-A, C, and E, 5th Weather Wing," Jan-Jun77, itself included as Appendix 2 in Vol I of "History of the 5th Weather Wing," Jan-Jun77.

⁷⁴ Ltr Lt Col Darrell T. Holland, OL-E, 5WW, to OL-C 5WW, "Unit Information Report - August 1977," 2Sep77, included within Sup Doc #11 to "History of OL-A, C, and E, 5th Weather Wing," Jul-Dec77, itself included as Appendix 2 in Vol I of "History of the 5th Weather Wing," Jul-Dec77.

⁷⁵ See: Army Field Manual 31-3/Air Force Manual 105-4, *Weather Support for Field Army Tactical Operations*, Dec69, and AWS Sup 1 to AFM 105-4, "Weather: Weather Support for Field Army Tactical Operations," 21Jul75--included together as Sup Doc #18 in Vol II, "Supporting Documents," of this study.

⁷⁶ See: AR 115-10/AFR 105-3, "Environmental Services: Meteorological Support for the U.S. Army," 9Jun70, and AWS Sup 1 to AFR 105-3, "Weather: Meteorological Support for the U.S. Army," 8Apr77--included together as Sup Doc #19 in Vol II of this study.

⁷⁷ Ltr and atch ("Background Information") Maj Gen William W. Berg, Asst Dep Ch of Staff for Programs and Resources (AF/PR), USAF, to Dir of Intel Spt (DAMI-DS), Dept of the Army, "U.S. Army Requirements for Direct Weather Service," 24Oct72, included as Sup Doc #20 in Vol II, "Supporting Documents," of this study.

- ⁷⁸Then serving as chief of the Env Svcs Div (MAC/XPPE), Directorate of Programming and Policy, DCS Plans, HQ MAC.
- ⁷⁹Rowe Interview: *Army Weather Support*, p. 48, included as Sup Doc #4 in Vol II, "Supporting Documents," of this study.
- ⁸⁰Ltr, Col Wilson J. Boaz, asst DCS Ops, HQ AWS, to AWS (DO and CS), "Trip Report - Pentagon, Washington DC 5-6Apr73," 13Apr73.
- ⁸¹Interview by author on 18Jan79 at HQ AWS with Col LeMole, AWS vice commander.
- ⁸²Ltr Col Boaz to AWS (DO and CS), "Trip Report - Pentagon, Washington DC 5-6Apr73," 13Apr73.
- ⁸³Telephone interview by author on 23Jan79 with Col (USAF ret) Bennet.
- ⁸⁴Interview by author on 18Jan79 at HQ AWS with Col LeMole, AWS vice commander.
- ⁸⁵Vol I, "Narrative," p. 226, of "History of Air Weather Service," 1Jul72-30Jun74 (S). Info used (U).
- ⁸⁶DoD Directive 4000.19, "Basic Policies and Principles for Interservice, Interdepartmental and Interagency Support," 27Mar72.
- ⁸⁷See: msg CSAF (LGXO) to ALMAJCOM (DCS Logistics), info DALO-OMD Wash DC, *et al.*, "DoDD 4000.19, 'Basic Policies and Principles for Interservice, Interdepartmental and Interagency Support,' Dated 27 March 72," 172115ZJan73; ltr Col Clarence B. Hand, ch, Log Planning Div (AF/LGXO), Asst for Log Planning, DCS Log, HQ USAF, to MAC (LGX), "USAF Weather Support to USA Units," 26Jan73; and ltr Col Earl A. Thompson, Dir of Log Plans (MAC/LGXP), DCS Log, HQ MAC, to AWS (LGS), "Defense Retail Interservice Support Program," 20Feb73--included together as Sup Doc #21 in Vol II, "Supporting Documents," of this study.
- ⁸⁸Vol I, "Narrative," p. 247, of "History of Air Weather Service," 1Jul72-30Jun74 (S). Info used (U).
- ⁸⁹See: ltr and atch (draft revision of AR 115-10/AFR 105-3) Bennet to MAC (XPPE), "Meteorological Support for the Army," 9Oct73; and ltr Col Theodore N. Mace, Dir of Programming and Policy (MAC/XPP), DCS Plans, HQ MAC, to HQ USAF (PRW), "Meteorological Support for the Army (Your Ltr, 9Oct73)," 27Nov73--included, respectively, as Atchs 5 and 6 to Rqmts Validation Directorate (AWS/DOQ), DCS Ops, HQ AWS, "Semiannual Report of Activities," Jul-Dec73, itself included within Tab 3 in Vol IX, "Supplements," of "History of Air Weather Service," 1Jul72-30Jun74 (S). Info used (U).
- ⁹⁰See: ltr Bennet to MAC (XPPE), "Meteorological Support for the Army (Your Ltr, 27 Nov 1973)," 14Jan74; and ltr Col William E. Harris, Jr, Dep Dir of Programming and Policy (MAC/XPP), DCS Plans, HQ MAC, to HQ USAF (PRW), "Meteorological Support for the Army (Your Ltr, 14Jan74)," 21Feb74--included together as Sup Doc #22 in Vol II, "Supporting Documents," of this study.

⁹¹Background paper, Col Joseph D. Saccone, asst DCS Ops, HQ AWS, "AR 115-10/AFR 105-3 Meteorological Support for the US Army," n.d. (circa Mar75), included as p. 59 of Sup Doc #46 in Vol II, "Supporting Documents," of *History of Air Weather Service*, 1Jul74-31Dec75 (S). Info used (U).

⁹²Ltr and atch (draft rewrite of AR 115-10/AFR 105-3), Lt Col Robert E. Julian, Dir Rqmts Validation (AWS/DOQ), DCS Ops, HQ AWS, to LWW (DO), *et al.*, "Update of AR 115-10/AFR 105-3, Meteorological Support to the US Army," 7May74, included as Sup Doc #23 in Vol II, "Supporting Documents," of this study.

⁹³Telephone interview by author on 19Jun78 with Col Cummins, AF/PRW.

⁹⁴Ltr Cummins to AWS (DO), "AFR 105-3/AR 115-10 (AWS/DOQ Ltr, 25 Aug 1975)," 29Aug75, included as Sup Doc #24 in Vol II, "Supporting Documents," of this study.

⁹⁵Telephone interview by author on 19Jun78 with Col Cummins, AF/PRW.

⁹⁶USAICS fact sheet, "Joint Working Group (JWG), US Army Weather Support, ACN 22555I," 17May76, included as Encl #3 to ltr Lt Col James C. Owens, staff weather officer to USAICS, to 16WS (CC), "Unit Activity Letter (May 1976)," 26May76, itself included within Sup Doc #9 to "History of the 16th Weather Squadron," Jan-Jun76, which, in turn, is included as Appendix 5 in Vol 2 of "History of the 5th Weather Wing," Jan-Jun76.

⁹⁷See: ltr Lt Col Seymour Levine, ch, Intel Spt Div (DAMI-TSI), Dept of the Army, to TRADOC (ATCD-SIE), "Proposed Revision of AR 115-10/AFR 105-3, Meteorological Support to the US Army," 13Jul76; and ltr Capt R. C. Tyler, asst Adj Gen (ATCD-SIE), TRADOC, to CACDA, *et al.*, "Proposed Revision of AR 115-10/AFR 105-3, Meteorological Support to the US Army," 2Aug76--included together as Sup Doc #25 in Vol II, "Supporting Documents," of this study.

⁹⁸Much of the pertinent correspondence is included as atchs to "History of OL-A, C, and E, 5th Weather Wing," Jul-Dec77, itself included as Appendix 2 in Vol 1 of "History of the 5th Weather Wing," Jul-Dec77.

⁹⁹Ltr Macy to OL-C 5WW, "Unit Information Report (RCS: 5WW DO (M) 7203)," 3Aug77, included as Sup Doc #9 to "History of OL-A, C, and E, 5th Weather Wing," Jul-Dec77, itself included as Appendix 2 in Vol 1 of "History of the 5th Weather Wing," Jul-Dec77.

¹⁰⁰Ltr and atch (proposed Army rewrite of jt reg) Col Cummins, AF/PRW, to MAC (XPP), "Revision of AR 115-10/AFR 105-3, Weather Support to the US Army" 12Oct77, included as Sup Doc #26 in Vol II, "Supporting Documents," of this study.

¹⁰¹Ltr and atch (proposed AWS rewrite of jt reg) Col Ramon C. Wilkins, ch of staff, AWS, to MAC (XPP), "AR 115-10/AFR 105-3, Weather Support to the US Army (Yr Ltr, 17 Oct 77)," 15Dec77, included as Sup Doc #27 in Vol II, "Supporting Documents," of this study.

- 102 Ltr and atch ("Comments on Issues and Actions Pertaining to Army Weather Support") Rowe to CINCMAC, "AWS/CC Monthly Activity Report," 7Dec77, included as Sup Doc # 28 in Vol II, "Supporting Documents," of this study.
- 103 Memo and atch CINCMAC to AWS (CC), info MAC (XP), "AWS/CC Monthly Activity Report," 12Dec77.
- 104 Ltr Col John D. Sims, Director, Programming and Policy (MAC/-XPP), DCS Plans, HQ MAC, to HQ USAF (PRW), "AR 115-10/AFR 105-3, Weather Support to the US Army," 17Jan78, included as Sup Doc #29 in Vol II of this study.
- 105 Telephone conversations by author on 13Apr78 with: Lt Col John H. Haneklau and Maj John J. Kelly from the Env Svcs Div (MAC/-XPPE), Dir of Programming and Policy, HQ MAC; Lt Col Dell V. McDonald, Dir of Concepts & Special & Tech Svc Plans (MAC/XOZ), DCS Ops Plans, HQ MAC; Maj Mervin G. Davis, Tech Plans Div (AWS/DOQX), Dir of Rqmts, DCS Ops, HQ AWS; and Maj Glenn W. McBride, Readiness Div (AWS/DOQP), Dir of Rqmts, DCS Ops, HQ AWS.
- 106 Msg 2WW (DO) to AWS (DO), "AWS Army Support Policy (Yr Ltr, 15 Nov 77)," 281425ZNov77.
- 107 Ltr Col John W. Reames, ch, ops div, 5WW, to AWS (DO), "Army Support," 25Nov77, included as Sup Doc #29 in Vol 3 of "History of the 5th Weather Wing," Jul-Dec77.
- 108 Ltr Col Sims, (MAC/XPP) to AWS (CS), "Memo of HQ USAF/PRW Discussions with MAC and AWS Staff, 10-11 Nov 77," 23Nov77, and DCS Ops (AWS/DO), HQ AWS, "One Liners for CC," Nov77.
- 109 Telephone interview by author on 19Jun78 with Col Cummins.
- 110 Ltr and atch ("Position Paper," with 3 atch) Lt Col Donald E. Smith, Director of Rqmts (AWS/DOQ), DCS Ops, HQ AWS, to AWS (DOS, *et al.*), "AWS Army Weather Support Policy," 28Sep77, included as Sup Doc #30 in Vol II of this study.
- 111 Memo for record, Rowe, "Army Weather Support," 8Aug77, included as Sup Doc #31 in Vol II of this study.
- 112 Ltr and atch Lt Col Smith, AWS/DOQ, to AWS (DOS, *et al.*), "AWS Army Weather Support Policy," 28Sep77.
- 113 See: ltr w/o atch (see *ibid.*) Col Norman F. Rauscher, asst DCS Ops, HQ AWS, to LWV (DO, *et al.*), "AWS Army Support Policy," 30Oct77; and ltr and atch ("Policy") Col Hyko Gayikian, ch of staff, AWS, to LWV (CC), *et al.*, "AWS Army Support Policy," 15Nov77--included together as Sup Doc #32 in Vol II of this study.
- 114 Ltr and 2 atch (position paper and atch, "AWS Army Support Policy," and position paper and atch, "AWS Army Reserve Component--ARC--Policy") Col Rauscher, asst DCS Ops, HQ AWS, to AWS (CS), "Presentation to HQ AWS Council," 5Dec77, included as Sup Doc #33 in Vol II, "Supporting Documents," of this study.
- 115 Rowe Interview: Army Weather Support, p. 17, included as Sup Doc #4 in Vol II of this study.

116 Vol I, *Narrative*, pp. 65-66, 71-74, of *History of Air Weather Service*, 1976 (S). Info used (U).

117 Ltr Lt Col Swayne, AWS/LN, to Mr. Beck, Dept of the Army (DAMI-TST-I), "Army Weather Support," 22Dec77, included as Sup Doc #6 in Vol II, "Supporting Documents," of this history.

118 Col Rowe's remarks recorded by the author at the HQ AWS staff meeting of 20Oct75.

119 Msg HQ Dept of the Army (DAMO-RQS) to comdr TRADOC, *et al.*, info comdr FORSCOM, *et al.*, "The Use of Realistic Battlefield Environmental Conditions throughout the Army," 222225ZNov77, included as Sup Doc #2 to "History of OL-A, C, and E, 5th Weather Wing," Jan-Jun78, itself included as Appendix 2 in Vol 1 of "History of the 5th Weather Wing," Jan-Jun78.

120 Memo Col Sims, MAC/XPP, to MAC (XP), "Army Weather Support," 17Jan78.

121 Ltr Gen William G. Moore, Jr, comdr in ch, MAC, to Gen David C. Jones, ch of staff, USAF, 4Jan78, p. 7.

122 See coverage in the first chapter herein, and Vol I, *Narrative*, pp. 16-20, of *History of Air Weather Service*, 1976 (S). Info used (U).

123 *Rowe Interview: Army Weather Support*, pp. 52-53, included as Sup Doc #4 in Vol II of this study.

124 *Ibid.*, 53.

125 *Ibid.*, 66-68.

126 *Ibid.*, 22-23

127 *Ibid.*, 18, 46.

128 *Ibid.*, 19, 47-49.

129 *Ibid.*, 55.

130 *Ibid.*, 11-12, 36.

131 *Ibid.*, 35-38.

132 *Ibid.*, 57-58.

133 *Ibid.*, 38-40.

134 *Ibid.*, 19, 26.

135 *Ibid.*, 27-28, 38, 40-41.

136 *Ibid.*, 25-26.

137 *Ibid.*, 28-30, 44-45.

138 *Ibid.*, 59-60.

139 *Ibid.*

140 See text of Rowe's presentation, "Army Weather Support," and accompanying slides, included as Sup Doc #34 in Vol II, "Supporting Documents," of this study.

141 Ltr Rowe to CINCMAC, "AWS/CC Monthly Activities Report," 4Aug78.

142 Ltr Rowe to CINCMAC, "AWS/CC Monthly Activities Report," 3Feb78.

143 Ltr Lt Col Swayne, Army liaison officer to AWS, to TRADOC (ATFE), "Liaison Activities (RCS ATFE-2)," 5Jul78.

144 Ltr Office of the Adjutant Gen, Dept of the Army, to Sec of the Army, *et al.*, "Special Meteorological Task Force," n.d. (*circa* 1Mar78); and ltr Col Fuller, ch, Imagery Intel Div, Asst Ch of Staff for Intel, Dept of the Army, to Sec of the Army, *et al.*; "Recommendations for Improvement of Army Meteorological Activities," 19May78--included as Sup Docs #13 and 14, respectively, to "History of OL-A, C, and E, 5th Weather Wing," Jan-Jun78, itself included as Appendix 2 in Vol 1 of "History of the 5th Weather Wing," Jan-Jun78.

145 Ltr Col Wilkins, ch of staff, AWS, to HQ USAF (PRW), "Recommendation for Improvement of Army Meteorological Activities," 22May78, included as Sup Doc #35 in Vol II, "Supporting Documents," of this study. See also point paper Col Saccone, DCS Ops, HQ AWS, "Army Weather Support - AWS Initiatives (Visit of General Robert F. Shoemaker, Acting Commander, United States Army Forces Command)," 8Aug78.

146 Ltr Rowe to CINCMAC, "End of Tour Report," 17Aug78.

147 Ltr Lt Gen Thomas M. Ryan, Jr, vice comdr in ch, MAC, to HQ USAF (XO), "Revision of AR 115-10/AFR 105-3, Meteorological Support for US Army," 4Dec78; and ltr Maj Gen Hoyt S. Vandenberg, acting Dep Ch of Staff for Plans and Ops, HQ USAF, to CINCMAC (CV), "Revision of AR 115-10/AFR 105-3, Meteorological Support for US Army," 19Dec78--included together as Sup Doc #36 in Vol II, "Supporting Documents," of this study.

148 On the grounds that such presence was not needed, Colonel Wilkins, the AWS chief of staff and ex officio AWS Council chairman, denied the author's request to sit in as an observer on the council meeting of 23 March 1979, at which AWS' Army weather support policy was deliberated by the AWS leadership. It was clear to the author that the Kaehn administration did not wish to be encumbered with facts about past machinations on Army weather support.

149 Ltr and atch (ltr and 2 atch ["AWS Policy on Army Weather Support," and "AWS Current Army Support"] Col Wilkins, "Report of HQ AWS Council Meeting," 17Apr79) Col Wilkins, ch of staff, AWS, to LWW (CC), *et al.*, "AWS Army Support Policy," 3May79, included as Sup Doc #37 in Vol II, "Supporting Documents," of this study.

150 CMSgt Horn's remarks recorded by the author at the HQ AWS staff meeting of 10May79.

CHAPTER 10 - CONCLUSION: ASSETS AND ATTITUDES

¹The remarks of Cols (USAF ret) Leonard V. Gillespie and Walton L. Hogan, Sr, former comdrs of the 7WS and 16WS, respectively, who spent much of their careers in Army weather support, are found in memo for record and 3 atch, Col William E. Cummins, II, asst DCS Ops, HQ AWS, "Army Support Forum," pp. 1-3, 21Apr72.

²Telephone interview by author on 25Jan79 with Col (USAF ret) Mortimer F. Bennet, LWG comdr in 1971; and ltr and atch Col Daniel B. Mitchell, LWG comdr, to LWW, "Project CORONA HARVEST End of Tour Report," n.d. (*circa* 7Jan70), included within Tab 104 of Fuller, ed., "End of Tour Reports," 15Apr70.

³Vol I, Narrative, pp. 7-8, of *History of Air Weather Service*, 1976 (S). Info used (U).

The opening chapter, entitled "The Vietnam War," briefly reviews the problems AWS endured supporting the Eighth Army during the Korean War. It looks at post-war directives addressing Army weather support doctrine and policy, including Air Force Manual 102-6, Section 1-10, for military operations, of December 1956; AWS Regulation 55-25 of October 1957 addressing Army support; and the 1963 version of Army Regulation 102-3, predicated on one of over 200 references-mission requirements concluded by the Army and Air Force under the National Security Act of 1947. It also discusses policy guidance from the Air Staff in the late 1950s.

Chapter 2 on Vietnam looks at the effects of weather and weather support on Army operations in combat, in particular to the 101st Airborne Division (Airmobile) and the 101st Airborne Division during the battles at Khe Sanh, and the A Shau Valley in the 1968 Tet offensive. Addressed are: weather modification efforts in 1968 (including rain-making missions by WC-119s and RF-4Cs over the Ho Chi Minh Trail) and the A Shau Valley; and attempts at clearing warm fog at Khe Sanh by dropping salt from C-119s; observing, forecasting, and staff weather officer service provided to, and utilized by, General Westmoreland and his staff at USMACV, General Momyer and his staff at Seventh Air Force, by Major General Tolson and his staff Cavalry Division (Airmobile), and by the 101st Airborne Division; and the problems which arose (many identical to those faced by AWS in the Korean War), including personnel organizational procedures that could not keep pace with weather requirements, Army commanders unaware of the services available through AWS or how to use it, AWS personnel who had no prior experience or training with the Army, over-sophisticated tactical weather observing equipment that would not work, or could not be kept in commission in the field, and glaring shortcomings in weather communications concepts and support in a combat arena.

Chapter 3 discusses the Army's organization in the 1970s, and the structure AWS webbed together to support it. It investigates the Army's meteorological function as handled in the Department of the Army staff, at the Army's State Science Laboratory at Fort Hushburn, TRADOC's (Training and Doctrine Command) Combined Arms Center and Combined Arms Command Development Activity (CACDA) at Fort Leavenworth, and at USAICD (United States Army Intelligence Center and School) at Fort Hushburn. It looks at the Army's EAD (Echelon Above Division) decision of 1973, the EAC (Echelon Above Corps) concept, and efforts through the years to form an Army Meteorological Service or an Army Weather Service.

Chapter 4 delves into the manpower authorized and assigned AWS by the Air Staff to support the Army; the formal procedures used to determine manning levels, including percentage (Statement of Requirements) and the roles AWS Staff Weather Officers and the Army's G-3

This study is a critical analysis of the unsatisfactory support provided the United States Army by the United States Air Force's Air Weather Service (AWS) from the 1960s through 1978.

The opening chapter, entitled "Pre Vietnam," briefly reviews the problems AWS endured supporting the Eighth Army during the Korean War. It looks at post-war directives addressing Army weather support doctrine and policy, including Air Force Manual 105-6, *Weather Service for Military Agencies*, of December 1956; AWS Regulation 55-56 of October 1957 addressing Army support; and the 1962 version of Army Regulation 115-10/Air Force Regulation 105-3, predicated on one of over 200 roles-and-mission agreements concluded by the Army and Air Force under the National Security Act of 1947. It also discusses policy guidance from the Air Staff in the late 1950s.

Chapter 2 on Vietnam looks at the effects of weather and weather support on Army operations in combat, in particular to the 1st Cavalry Division (Airmobile) and the 101st Airborne Division during the battles at Hue, Khe Sanh, and the A Shau Valley in the 1968 Tet offensive. Addressed are: weather modification efforts in 1968 (including rain-making missions by WC-130s and RF-4Cs over the Ho Chi Minh Trail and the A Shau Valley; and attempts at clearing warm fog at Khe Sanh by dropping salt from C-123s); observing, forecasting, and staff weather officer service provided to, and utilized by, General Westmoreland and his staff at USMACV, General Momyer and his staff at Seventh Air Force, by Major General Tolson and his 1st Cavalry Division (Airmobile), and by the 101st Airborne Division; and the problems which arose (many identical to those faced by AWS in the Korean War), including peacetime programming procedures that could not keep pace with wartime requirements, Army commanders unaware of the service available through AWS or how to use it, AWS personnel who had no prior experience or training with the Army, over-sophisticated tactical weather observing equipment that would not work, or could not be kept in commission in the field, and glaring shortcomings in weather communications concepts and support in a combat arena.

Chapter 3 discusses the Army's organization in the 1970s, and the structure AWS webbed together to support it. It investigates the artillery meteorological sections, and how the Army's meteorological function was handled on the Department of the Army staff, at the Atmospheric Sciences Laboratory at Fort Huachuca, TRADOC's (Training and Doctrine Command) Combined Arms Center and Combined Arms Combat Development Activity (CACDA) at Fort Leavenworth, and at USAICS (United States Army Intelligence Center and School) at Fort Huachuca. It looks at the Army's EAD (Echelons Above Division) decision of 1973, its EAC (Echelon Above Corps) concept, and efforts through the years to form an Army Meteorological Service or an Army Weather Service.

Chapter 4 delves into the manpower authorized and assigned AWS by the Air Staff to support the Army; the formal procedures used to determine manning levels, including peacetime SORs (Statement of Requirements) and the roles AWS Staff Weather Officers and the Army's G-2

(Intelligence) officers played in formulating them; and the Air Force's MEFFPAK (Manpower and Equipment Force Packaging) system with its MANFOR (Manpower Force Packaging), LOGFOR (Logistics Force Packaging System), and UTC (Unit Type Code) elements. It looks at the composition and assignment of AWS weather teams (Combat Weather Team, Organic Weather Team, etc.) at corps, divisions and brigades; and the decision in 1973, because of unending manpower reductions the Air Staff and MAC were imposing on AWS, to form skeleton "Cadre Weather Teams" when corps and divisions were in garrison that, in theory if not actual practice, could be beefed up to full authorization during tactical situations or war. It also looks at the issues of utilizing AWS weatherwomen with the Army in war, and the perpetual problem AWS faced in getting sufficient volunteers for jump training to fill parachute-qualified manpower slots.

Chapter 5 analyzes the difficulties AWS faced with new meteorological and weather communications equipment in the 1960s and 1970s, including: the AN/MMQ-2 meteorological van; the AN/TMQ-25 tactical ceilometer; the AN/TMQ-22 tactical observing set; the Belt Weather Kit; the AN/TPS-41 and AN/TPS-68 tactical weather radars; tactical weather satellite readout vans for use in Army weather support, including the Mark IV DMSP (Defense Meteorological Satellite Program) van; SIDS (Satellite Imagery Dissemination System) and "mini"-SIDS (Muirhead and Harris Corporation facsimile transmitters and receivers); battlefield or tactical area weather sensors, including EROWS (Expendable Remote Operation Weather Station) PAWOS (Portable Automatic Weather Observing Station), TAWS (Tactical Area Weather Sensor), RAWS (Remote Automatic Weather Station), BATSS (Battlefield Targeting Support System), and PRESSURS (Pre-Strike Surveillance/Recon System); the MSQ-10 mobile weather communications van; the Tactical Weather System and its Tactical Weather Analysis Center (TWAC); and AWDS (Automated Weather Distribution System). Discussed also is the transfer of AWS' weather equipment maintenance mission and most associated manpower (775 manpower authorizations) to AFCS (Air Force Communications Service) in 1977, and how well AFCS' maintenance service might stand up in war or with the passage of time.

Chapter 6 looks at the critical question of life-sustaining TOE (Table of Organization and Equipment) and MTOE (Modified Table of Organization and Equipment) support to AWS' weather personnel by the Army units they served, and whether Army "proponency" for the weather TOEs/MTOEs should be the responsibility of its Signal or Intelligence functions. Investigated was an Army concept to attach AWS' division weather teams to the division's Intelligence Company, tested in TARS (Tactical Reconnaissance and Surveillance)-75 at Fort Hood in 1975.

Chapter 7 reviews the critical question of the mid-1970s of whether AWS support at the division level should be direct or indirect (remote), in view of the Army's efforts to reduce the size of its division command posts (the Division Tactical Operations Center--DTOC) and mute their "electronic signatures." Looked at is the Army's MASSTER (Modern Army Selected Systems Tactical Evaluation and Review) Test FM-286 in 1975 at Fort Hood, and indecision among Army general officers, surfaced at a meeting of the Army's Intelligence Advisory Group at Fort Huachuca in 1975, of whether or not AWS support at division should be direct or indirect. Insofar as their bearing on that issue was concerned, reviewed also is the Army's IOSS (Intelligence Organization and Stationing Study), and the test of that concept at Fort Hood in 1975--the TCATA (TRADOC Combined Arms Test Activity) CEWI (Combat Electronic Warfare Intelligence) Test FM-362.

Chapters 8 and 9 critically investigate the Army's requirements for weather support, on which AWS placed so much emphasis, and the all-encompassing topic of weather support doctrine and policy. Submitted to the microscope are the formal SOR (Statement of Requirement) process; the Army's Met-70, Met-75, and TESS (Tactical Environmental Support System) studies, which concluded that AWS support was unsatisfactory, and its MAP/SAMSR (Master Plan for the Satisfaction of Army Meteorological Support Requirements) plan for correcting the inadequacies and satisfying its weather support requirements; AWS' reaction to TESS and MAP/SAMSR; AWS support to Army National Guard and Army Reserve units, and to NATO army forces; the Forward Area Limited Observing Program (FALOP); Air Staff, AWS, and Army policy as expressed by key officials and set forth in individual service regulations and the principal joint directives (Army Regulation 115-10/Air Force Regulation 105-3, and Army Field Manual 31-3/Air Force Manual 105-4); and, in response to increasing evidence that AWS support to the Army was unsatisfactory, the shocking and dramatic proposal by the AWS commander, Brigadier General Berry W. Rowe, in 1977, to chop off all direct AWS support below corps level.

Chapter 10 concludes that attitudes and assets were the reasons why problems in Army weather support persisted unresolved year after year, and why AWS support to the Army in Vietnam and the ensuing period through 1978 was inadequate and unsatisfactory. It suggests that, while the problem of too few assets (men, materiel, and money) would persist under peacetime Air Force budgets so long as AWS was considered "tail" rather than "teeth," AWS could overcome the attitude problem if it stopped levying an unjust tax in promotion and career potential on those of its people evidencing signs of making Army weather support their life's work.

G L O S S A R Y

AAC Alaskan Air Command
AAF Army Airfield
AB Air Base
ADCOM Aerospace Defense Command
ADWS Automated Digital Weather Switch
AFB Air Force Base
AFCRL Air Force Cambridge Research Laboratories
AFCS Air Force Communications Service
AFGWC Air Force Global Weather Central
AFLANT See USAFLANT
AFLC Air Force Logistics Command
AF/PR Deputy Chief of Staff, Programs and Resources,
HQ USAF
AF/PRW Office of the Assistant for Weather, Deputy
Chief of Staff, Programs and Resources,
HQ USAF
AFSC Air Force Specialty Code
Air Force Systems Command
AF/XO Deputy Chief of Staff, Plans and Operations,
HQ USAF
AI Army Installation
AMC Army Materiel Command
AMS Automated Meteorological System
APO Army Post Office
APT Automatic Picture Transmission
ARADCOM Army Air Defense Command
ARC Army Reserve Components
ARRS Aerospace Rescue and Recovery Service
ARTADS Army Tactical Data System
AS Air Station
ASL Atmospheric Sciences Laboratory
AWDS Automated Weather Distribution System
AWN Automated Weather (communications) Network
AWS Air Weather Service

BATSS Battlefield Targeting Support System

CACDA Combined Arms Combat Development Activity
CBR Chemical-Biological-Radiological
CDC Combat Developments Command
CENTAG Central European Army Group
CEWI Combat Electronic Warfare Intelligence
CINCAL Commander In Chief, Alaskan Command
CINCCONAD Commander In Chief, Continental Air Defense
Command
CINCPAC Commander in Chief, Pacific Command
CINCSAC Commander In Chief, Strategic Air Command
CG Commanding General
CONARC Continental Army Command
CONUS Continental United States
CWO Chief Warrant Officer

CWT	Combat Weather Team
CZ	Canal Zone
DA	Department of the Army
DA/ACSC-E	Assistant Chief of Staff, Communications and Electronics, Department of the Army
DA/ACSFOR	Assistant Chief of Staff, Forces Development, Department of the Army
DA/ACSI	Assistant Chief of Staff, Intelligence, Department of the Army
DAF	Department of the Air Force
DARCOM	United States Army Materiel Development and Readiness Command
DC	District of Columbia
DDR&E	Defense Development Research and Engineering
DESC	Defense Electronics Supply Center
DMSP	Defense Meteorological Satellite Program
DMZ	De-Militarized Zone
DoD	Department of Defense
DTOC	Division Tactical Operations Center
EAC	Echelon Above Corps
EAD	Echelons Above Division
EROWS	Expendable Remote Operating Weather Station
ESD	Electronic Systems Division, AFSC
ETAC	See USAF ETAC
EUCOM	See USEUCOM
EWI	Electronic Warfare and Intelligence
FAA	Federal Aviation Administration
FAC	Forward Air Controller
FALOP	Forward Area Limited (weather) Observation Program
FORSCOM	Forces Command
FM	Frequency Modulation
GOR	General Operational Requirement
HF	High Frequency
HQ	Headquarters
IAG	Intelligence Advisory Group
IDA	Institute for Defense Analysis
IMA	Individual Mobilization Augmentee
IOSS	Intelligence Organization and Stationing Study
ITOS	Improved TIROS Operational Satellite
JCS	Joint Chiefs of Staff
JTIDS	Joint Tactical Information Display System
LOGFOR	Logistics Force Packaging System
LST	Landing Ship, Tank
LZ	Landing Zone

MAC	Military Airlift Command
MANFOR	Manpower Force Packaging System
MAP/SAMSR	Master Plan for the Satisfaction of Army Meteorological Support Requirements
MASSTER	Modern Army Selected Systems Tactical Evaluation and Review
MATS	Military Air Transport Service
MEFFPAK	Manpower and Equipment Force Packaging
MI	Military Intelligence
MOS	Military Occupational Specialty
MSI	Mission Success Indicator
MTO&E	Modified Table of Organization and Equipment
NAC	Naval Avionics Center
NAFI	Naval Avionics Facility Indianapolis
NATO	North Atlantic Treaty Organization
NCO	Non Commissioned Officer
NOAA	National Oceanic and Atmospheric Administration
NOE	Nap Of the Earth
NORAD	North American Air Defense Command
NVN	North Vietnam
OAR	Office of Aerospace Research
OER	Officer Effectiveness Report
OL	Operating Location
O&M	Operation and Maintenance
OWT	Organic Weather Team
PACAF	Pacific Air Forces
PAWOS	Portable Automatic Weather Observing Station
PEC	Program Element Code
PEP	Product (weather forecast) Evaluation Program
Pibal	Pilot weather balloon
PIREP	Pilot (weather) Report
PME	Professional Military Education
PRESSURS	Pre-Strike Surveillance/Recon System
QOR	Qualitative Operational Requirement
QMR	Qualitative Materiel Requirement
RAD	Requirements Action Directive
RAWS	Remote Automated Weather Station
RDT&E	Research, Development, Test and Evaluation
REDCOM	Readiness Command
ROC	Required Operational Capability
ROK	Republic of Korea
ROTC	Reserve Officers' Training Corps
RPV	Remotely Piloted Vehicle
R&R	Rest and Recouperation
RVN	Republic of Vietnam
SAC	Strategic Air Command
SACEUR	Supreme Allied Commander Europe
SALT	Strategic Arms Limitation Talks
SAMSO	Space and Missile Systems Organization

SEAOR	Southeast Asia Operational Requirement
SEA WECEN	Southeast Asia Joint Operations Weather Center
SIDS	Satellite Imagery Dissemination System
SMAMA	Sacramento Air Materiel Area
SOG	Studies and Observation Group
SOP	Standard Operating Procedure
SOR	Statement of Requirements
SOUTHCOM	Southern Command
TAC	Tactical Air Command
TARS-75	Tactical Reconnaissance and Surveillance (test), 1975
TAWS	Tactical Area Weather Sensor
TCATA	TRADOC Combined Arms Test Activity
TESS	Tactical Environmental Support System (study)
TIROS	Television and Infrared (weather) Observation Satellite
TO	Technical Order
TOA	Total Obligational Authority
TOC	Tactical Operations Center
TOE	Table of Organization and Equipment
TOS	Tactical Operations System
TRADOC	Training and Doctrine Command
TRESS	Tactical Remote Environmental Sensor System
TWAC	Tactical Weather Analysis Center
UHF	Ultra High Frequency
UK	United Kingdom
UN	United Nations
USACDC	United States Army Combat Developments Command
USACDC-INCSG	USACDC-Intelligence and Control Systems Group
USACDC/INTA	USACDC/Intelligence Agency, Intelligence and Control Systems Group
USACSG	United States Army CINCPAC Support Group
USAF	United States Air Force
USAFE	United States Air Forces in Europe
USAF ETAC	United States Air Force Environmental Technical Applications Center
USAFANT	United States Air Force Forces Atlantic
USAFSO	United States Air Forces Southern Command
USAICS	United States Army Intelligence Center and School
USARAL	United States Army Alaska
USARCARIB	United States Army Caribbean
USAREUR	United States Army Europe
USARPAC	United States Army Pacific
USARSO	United States Army Forces Southern Command
USARV	United States Army Vietnam
USCINCEUR	United States Commander In Chief, Europe
USCINCSO	Commander in Chief, United States Southern Command
USEUCOM	United States European Command
USFJ	United States Forces Japan
USFK	United States Forces Korea
USMACV	United States Military Assistance Command, Vietnam
USMC	United States Marine Corps
UTC	Unit Type Code

WETM	Weather Team
WG	Weather Group
WII	Weather Impact Indicator
WRS	Weather Reconnaissance Squadron
WS	Weather Squadron
WW	Weather Wing
WWMCCS	World Wide Military Command and Control System

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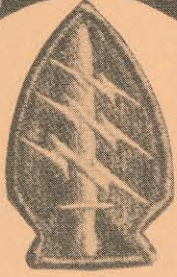
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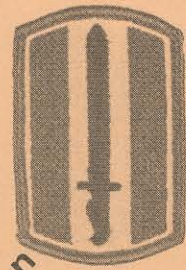


11th Air Defense Artillery Group



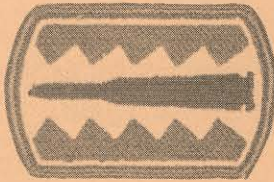
193d Infantry Brigade

4th Infantry Division (Mechanized) "The Ivy Division"



24th Infantry Division "Victory Division"

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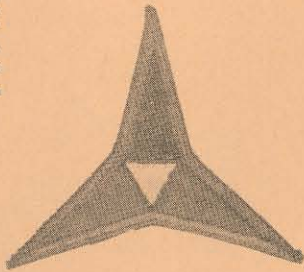
75th Infantry "Merrill's Marauders"



III Corps



XVIII Airborne Corps

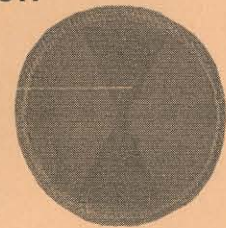


Fifth United States Army

7th Infantry Division "Bayonet"



194th Armored Brigade



6th Cavalry Brigade (Air Combat)

172d Infantry Brigade

Sixth United States Army



