

DTIC  
SELECTE  
APR 17 1995  
C D

NAVAL WAR COLLEGE  
Newport, R.I.

**COMMAND AND CONTROL WARFARE:  
PROMISE AND CHALLENGE FOR THE OPERATIONAL COMMANDER**

by

Jeffrey S. Locke  
LCDR USN

A paper submitted to the Faculty of the Naval War College in partial satisfaction of the requirements of the Department of Joint Military Operations.

The contents of this paper reflect my own personal views and are not necessarily endorsed by the Naval War College or the Department of the Navy.

Signature: J. S. Locke

11 November 1995

Paper directed by  
Captain David D. Watson  
Chairman, Joint Military Operations Department

DISSEMINATION STATEMENT A

Approved for public release;  
Distribution Unlimited

EK Niel

Faculty Advisor

6 Feb 95

Date

19950417 038

DTIC QUALITY INSPECTED 5

UNCLASSIFIED

Security Classification This Page

REPORT DOCUMENTATION PAGE

1. Report Security Classification: UNCLASSIFIED			
2. Security Classification Authority:			
3. Declassification/Downgrading Schedule:			
4. Distribution/Availability of Report: DISTRIBUTION STATEMENT A: APPROVED FOR PUBLIC RELEASE, DISTRIBUTION IS UNLIMITED			
5. Name of Performing Organization: Joint Military Operations Department			
6. Office Symbol: 1C		7. Address: Naval War College, 686 Cushing Rd., Newport, RI 02841-5010	
8. Title (Include Security Classification) : UNCLASSIFIED  Command and Control Warfare: Promise and Challenge for the Operational Commander.			
9. Personal Authors: Locke, Jeffrey, S., LCDR, USN			
10. Type of Report: Final		11. Date of Report: 13 FEB 95	
12. Page Count: 21			
13. Supplementary Notation: A paper submitted to the Faculty of the Naval War College in partial satisfaction of the requirements of the Joint Military Operations Department. The contents of this paper reflect my own personal views and are not necessarily endorsed by the Naval War College or the Department of the Navy.			
14. Ten key words that relate to your paper: Command and Control Warfare (C2W), Information Warfare, OPSEC, military deception, electronic warfare, PSYOP, physical destruction, command authority.			
15. Abstract: Command and Control Warfare (C2W) is emerging on the scene as a powerful new tool for the theater CINC or JFC. It offers the operational commander C2 superiority over an adversary by "getting into his decision cycle". The potential of the concept was demonstrated during Operation Desert Storm. However, there are three areas of concern that need to be addressed if C2W is to reach it's full potential. The most important is the level of authority vested in the C2W officer by the CINC or JFC. Without the appropriate level of authority, it may be difficult to integrate the five elements in a truly synergistic fashion. Second, the level of awareness and expertise needs to be heightened through a focus on training. And, finally, the relationship between Information Warfare and C2W needs to be defined to ensure a coordinated effort occurs. If properly developed, C2W offers the operational commander a powerful new war-fighting tool.			
16. Distribution / Availability of Abstract:	Unclassified	Same As Rpt	DTIC Users
18. Abstract Security Classification: UNCLASSIFIED			
19. Name of Responsible Individual: Chairman, Joint Military Operations Department			
20. Telephone: (401) 841-3414/4120		21. Office Symbol: 1C	

Security Classification of This Page: Unclass

Abstract of  
**COMMAND AND CONTROL WARFARE:  
 PROMISE AND CHALLENGE FOR THE OPERATIONAL COMMANDER**

Command and Control Warfare (C2W) is emerging on the scene as a powerful new tool for the theater CINC or JFC. Consisting of the integrated use of operations security, military deception, psychological operations, electronic warfare, and physical destruction, it offers the operational commander C2 superiority over an adversary by "getting into his decision cycle". The potential of the concept was clearly demonstrated during Operation Desert Storm. However, there are three areas of concern that need to be addressed if C2W is to reach it's potential as a powerful force multiplier. The most important is the level of authority vested in the C2W officer by the CINC or JFC. Without the appropriate level of authority, it may be difficult to integrate the five elements in a truly synergistic fashion. Second, the level of awareness and expertise needs to be heightened through a continuing focus on training and exercises. And finally, the relationship between Information Warfare and C2W needs to be defined to ensure a coordinated effort occurs. If properly developed, C2W offers the operational commander a powerful new war-fighting tool.

Accession For	
NTIS CRA&I	<input checked="" type="checkbox"/>
DTIC TAB	<input type="checkbox"/>
Unannounced Justification	<input type="checkbox"/>
By _____	
Distribution / _____	
Availability Codes	
Dist	Avail and/or Special
A-1	

**COMMAND AND CONTROL WARFARE:  
PROMISE AND CHALLENGE FOR THE OPERATIONAL COMMANDER**

**INTRODUCTION.** A new form of warfare is emerging. A type of warfare that is potentially so potent as to " deliver a decisive blow against an adversary before the outbreak of armed conflict or during its initial period".<sup>1</sup> This new concept of warfare is Command and Control Warfare (C2W). Defined as:

The integrated use of operations security (OPSEC), military deception, psychological operations (PSYOP), electronic warfare (EW), and physical destruction, mutually supported by intelligence, to deny information to, influence, degrade, or destroy adversary command and control (C2) capabilities, while protecting friendly C2 capabilities against such actions<sup>2</sup>

C2Ws intent is to focus more on using the power of information rather than military force to achieve military objectives. The objective of C2W is to "get inside" or disrupt the enemy's decision cycle<sup>3</sup> with devastating consequences on his ability to control his own forces, or gain useful intelligence on the military situation, while protecting our own C2 process. Necessarily then, C2W has both an offensive (counter-C2) and defensive (C2-protect) aspect.

Elements of C2W have been used since man has waged war. Certainly, military deception is a long standing practice in warfare and electronic warfare was used as early as 1904 in the Russo-Japanese war when both sides monitored and jammed the others radio

communications.<sup>4</sup> What is unique in C2W is the concept of the coordinated and integrated use of the five elements of C2W in a manner that provides a truly synergistic effect and acts as a "force multiplier" for the Combatant Commander or Joint Force Commander (JFC) in the most fundamental sense. In a demonstration of its potential, the principals of C2W were used in Operation Desert Storm<sup>5</sup> with the result that the Iraqi leadership's ability to effectively respond to the air and land operations was significantly decreased. As the concept and practice of C2W is more fully developed, the impact that C2W will have on military operations will increase.

There are, however, three areas of concern that, unless adequately addressed, could diminish the potential of C2W. The first, and most important, is the authority vested in the C2W officer by the CINC of JFC. The second is the familiarity that staffs and forces have with C2W as expressed by the level of training. And finally, the relationship between C2W and Information Warfare needs to be clearly articulated. These will be discussed further.

**IMPLEMENTATION.** Desert Storm has been described as a "textbook application of the C2W strategy"<sup>6</sup> utilizing all five elements (also known as the five pillars of C2W)<sup>7</sup> in a coordinated and integrated fashion. Even though C2W per se, did not exist, (i.e. there was not a dedicated C2W officer or staff implementing this new concept) the thorough planning and use of the five individual elements (often in a coordinated manner) demonstrated the

power and efficacy of the concept. As a result, the J3s of various combatant and support commands held a series of meetings to better define the concept and application of the five individual elements.<sup>8</sup> The name Command and Control Warfare was formed and a series of joint and service related documents and directives related to C2W have emerged, including a 2nd draft of Joint Pub 3-13, Joint Doctrine for Command and Control Warfare (C2W) Operations, 1 September 1994. The combatant commands have established C2W planning cells<sup>9</sup> and the Joint Command and Control Warfare Center(JC2WC) in San Antonio, Texas, (formerly the Joint Electronic Warfare Center) has been established with emphasis on providing direct C2W support to operational commanders.<sup>10</sup>

From all of this, it is easy to see that "C2W is ... a new operational concept"<sup>11</sup> that has come of age. Planning, coordination, and control will be at the operational (CINC, JFC) or strategic (National) level, although execution can often be at the tactical level. In fact, it has been rightly observed that, to be most effective, "C2W should be centrally controlled at the combatant commander or joint task force commander level...execution of C2W missions should be decentralized".<sup>12</sup> Of course, the planning, coordination, and execution of C2W involves the five elements (or pillars) supported by Intelligence and Communications. However, the implementation of C2W does not necessarily involve the use of all five elements simultaneously. It may involve the use of only two or, depending on the military

situation, the use of only one element. What is important is the planning for and control of the coordinated execution of the five (or less) elements so they complement each other in a synergistic manner, thereby, greatly assisting the operational commander in decisively achieving his objectives. To further understand the value of the coordinated planning and execution of the five elements, an overview is warranted.

**OPSEC** is a process used for denying adversaries information about friendly intentions, capabilities, or limitations.<sup>13</sup> It goes beyond the important functions such as phone security or not discussing classified information outside of secure spaces, functions that normally come to mind when discussing OPSEC. Within the framework of C2W, OPSEC is used in its broadest sense as a means "to deny critical information necessary for the adversary commander to accurately estimate the military situation".<sup>14</sup> As a form of counter-C2, military deception and PSYOP supports OPSEC as well as EW and physical destruction. By misleading an adversary commander or degrading or destroying his ability to collect information, he is denied that critical information and his decision cycle is slowed or disrupted.

**PSYOP** are planned operations to convey selected information and indicators to foreign audiences to influence their emotions, motives, objective reasoning, and ultimately the behavior of foreign governments, groups, and individuals.<sup>15</sup> It is also used in a C2-protect

mode to counter an adversary's propaganda against friendly forces.<sup>16</sup> Generally thought of in terms of loudspeaker broadcasts and leaflet drops, normally aimed at broader audiences, PSYOP also includes political and diplomatic communiques and other more "covert" means aimed at an adversary's leadership. A potent tool by itself, when combined with the other elements of C2W, primarily military deception and physical destruction, PSYOPs effectiveness is significantly enhanced. Although the use of PSYOP by the U.S. military has been "episodic at best"<sup>17</sup> it was used with spectacular results in Desert Storm and "Significantly contributed to the large numbers of enemy prisoners of war -- 87,000."<sup>18</sup>

Of the five elements, however, PSYOP may prove the most difficult to integrate. Because final approval of PSYOP activities resides with the Under Secretary of Defense for Policy during peacetime and the CINC or JFC in war,<sup>19</sup> difficulties may arise in fully integrating PSYOP into overall C2W planning during peacetime or in the transition period to conflict. This is exactly what happened in Desert Shield/Storm. The PSYOP planning cell had a plan ready for approval within one month of the invasion of Kuwait. The plan was hand carried to Washington but final approval was delayed until 12 Jan 1991...five days before the start of the air war.<sup>20</sup> An important lesson learned was "Lack of clear policy defining military PSYOP roles in transition periods is critical for future planning efforts."<sup>21</sup>

**MILITARY DECEPTION** are those actions executed to mislead enemy decision makers, causing them to derive and accept desired appreciations of military capabilities, intentions, operations or other activities. The intent is to evoke enemy actions that contribute to the originator's objective.<sup>22</sup> Various means of military deception have been practiced throughout the history of warfare. A classic example of military deception at the operational level was Operation Fortitude during World War II. Among other objectives, it was designed to convince the Germans that the invasion of Europe would take place at Calais vice Normandy. It achieved outstanding success and greatly contributed to the eventual success of Operation Overlord, the invasion of Europe and destruction of the German Army.<sup>23</sup> Unfortunately, "subsequent to World War II, the tendency has been to overlook the effects of deception"<sup>24</sup> at the operational level and the U.S. military has focused more on deception at the tactical level.

C2Ws primary focus is on military deception at the operational level.<sup>25</sup> OPSEC is critical to the successful attainment of military deception and PSYOP can contribute as well. Additionally, EW and physical destruction can contribute directly by reinforcing an adversary's perception (or misperception) or indirectly through support of OPSEC as mentioned earlier. Desert Shield/Storm saw the re-emergence of military deception at the operational level. During Desert Shield, Iraq was exposed to mass aircraft and tanker

sorties on a continuous basis to desensitize them to indicators of the actual attack. U.S. Marine amphibious forces conducted several exercises and rehearsals that convinced the Iraqis that an amphibious assault was imminent. This deception helped achieve the tactical surprise that set the stage for the defeat of Iraq.<sup>26</sup> With the development of C2W, military deception at the operational and tactical level should see a new emphasis.

**ELECTRONIC WARFARE** is any military action involving the use of electromagnetic and directed energy to control the electromagnetic spectrum or to attack the enemy.<sup>27</sup> It is divided into three subdivisions - electronic support (ES), electronic attack (EA), and electronic protection (EP).<sup>28</sup> ES, as Signals Intelligence (SIGINT), is electronic reconnaissance and can provide valuable information on an enemy's capabilities, intentions, and actions as well as BDA. EA is used to prevent or reduce an enemy's effective use of the electromagnetic spectrum through jamming, electromagnetic deception or the use of directed energy weapons (DEW).<sup>29</sup> EP is that aspect of EW involving actions taken to protect personnel, facilities, and equipment from the affects of friendly or enemy employment of EW.<sup>30</sup> It ensures friendly use of the electromagnetic spectrum without interruption or interference.

Not only does EW actively support the other elements of C2W, but combined it can "introduce delays into the enemy's decision-making cycle and decrease the reliability of the

information being collected"<sup>31</sup> while greatly enhancing the JFCs understanding of the military situation.

**PHYSICAL DESTRUCTION** in support of C2W is defined as "destruction of designated targets as an element of an integrated C2W effort...in which weapons are used against specific targets to influence, degrade or deny information to an adversary's C2 system or counter-C2 operations."<sup>32</sup> Weapons used can range from High Speed Anti-radiation missiles (HARM) used against radars to various other munitions used against critical C2 nodes or other C2W targets. Generally, C2-destruct missions require and warrant precision guided munitions (PGM), however, "area-type" weapons may have more utility in support of PSYOP or military deception operations.<sup>33</sup>

An important factor in physical destruction is ensuring that the C2W staff has strong representation on the joint targeting cell. This is to ensure that C2W targets are included on the target list with the right priority. Just as important is ensuring that certain enemy C2 functions that the C2W staff may not want destroyed as part of the integrated C2W strategy do not end up on the target list.

**INTELLIGENCE.** Simply stated, timely and accurate Intelligence is critical to the successful planning and execution of C2W. All five elements are equally dependent on accurate Intelligence if they are to be successful. Although all warfighting areas need timely

and accurate Intelligence, this requirement is especially true of C2W because "Intelligence is fundamental to effective planning, security, and deception."<sup>34</sup> Due to the nature of C2W, it has been accurately stated that "Intelligence...is the bedrock of the five pillars of C2W".<sup>35</sup>

**CHALLENGES TO IMPLEMENTATION.** Despite the great success enjoyed in Desert Storm and the significant promise that C2W offers as a war-fighting tool, there are three separate impediments that the operational commander should be conscious of if C2W is to support him to its full potential.

**C2 relationship.** The first, and most important, concerns the authority vested in the C2W officer by the CINC or JFC. This is rightfully the prerogative of each joint commander and this decision will be made based on the prevailing situation and circumstances. However, as envisioned in the draft form of Joint Pub 3-13, Joint Doctrine for Command and Control Warfare Operations, dtd 1 September 1994, the authority vested in the C2W officer will primarily be limited to coordination, although the final decision is obviously the operational commander's.<sup>36</sup> As C2W staffs are standing up it appears they are developing along this framework.<sup>37</sup> It is, therefore, important to understand the scope and limitations of a coordinating authority. As defined it is not technically a command relationship. It is:

A commander or individual assigned responsibility for coordinating specific functions and activities involving forces of two or more Services or two or more forces of the same Service.

The coordinating authority has the authority to require consultation...  
**but does not have the authority to compel agreement.**

Coordinating authority is a consultation relationship not an authority through which command may be exercised. Coordination authority is more applicable to planning...than to operations.<sup>38</sup>

At the initial stages of planning and development at the combatant command level, a C2W officer with coordinating authority may be adequate. However, if the CINC or a subordinate Joint Task Force Commander (CJTF) is involved in a conflict or crisis action planning possibly leading to conflict, the level of authority vested in the C2W officer needs to be expanded. This expanded authority is necessary because "it is service control of assets and resources that makes it difficult to make C2W a realistic, reliable strategy...".<sup>39</sup>

This doesn't mean that the C2W officer needs to have control of any or all assets assigned to carry out C2W related missions. As the philosophy of "centralized control, decentralized execution" implies, many C2W objectives and missions can be accomplished by forces at the tactical level under local tactical control. For instance, it is neither necessary nor desirable that Special Operations Forces (not including PSYOP) or aircraft assigned a C2W mission be under the control of the C2W officer. Nevertheless, within an integrated C2W strategy there may be times when control of certain assets by the C2W officer when they are performing specific C2W missions would ensure the best results.

More important than control of assets, though, is the authority to "compel agreement".

The C2W officer must have the authority to direct the coordinated planning efforts into an integrated C2W strategy. Without this, his effectiveness will be diminished and he could become nothing more than a point of deconfliction between the five elements, especially under the added pressure of crisis action planning or conflict. Of particular concern will be PSYOP as illustrated by the problems experienced in Desert Shield/Storm. Granted, C2W covers a broad area of interests and the C2W officer will not be able to compel all parties to his bidding. But this is true of all C2 relationships.

An example currently exists upon which to model a C2W officer's command relationship. That is the Navy's Command and Control Warfare Commander (C2WC), formerly the Space and Electronic Warfare Commander, that exists within the Composite Warfare Commander concept.<sup>40</sup> The C2WC is responsible for the direction and coordination of all activities associated with the planning and execution of C2W within a Battle Group. He is a warfare commander who, when necessary, can request and have assets assigned for the execution of C2W. This concept has worked effectively and successfully for several years.

**Training.** If the C2W officer is to direct the integrated planning and execution of the five elements he must be thoroughly familiar with them. This is accomplished through attending C2W related schools, conferences, and meetings. More importantly, the level of

knowledge and expertise of the C2W officer and staff can be significantly enhanced through participation in rigorous and realistic exercises. Fortunately, there are solid efforts underway in this area.<sup>41</sup>

Training is of particular importance for a JFC's staff who may not have the expertise or "support of an elaborate, permanent infrastructure."<sup>42</sup> To assist the various staffs and especially those non-standing Joint Task Force staffs in time of crisis, the JC2WC in San Antonio, Tx., has developed regionally focused C2W teams. These teams are also available for exercises.<sup>43</sup> The important point, though, is that the exercises and training must be a continual process.

**Information Warfare.** The rapid advances in technology that are occurring have had a significant impact on information technology to such an extent that we are on the verge of the "eclipse of the industrial age and the start of the information age."<sup>44</sup> As these changes become more pronounced we are finding that "knowledge and information have become the strategic and transforming resources..."<sup>45</sup> and, therefore, information and knowledge equate to power. From this the concept of Information Warfare (IW) as "a powerful lever capable of altering high-level decisions by the opponent"<sup>46</sup> has emerged.

There are obvious similarities between Information Warfare and C2W. They both attempt to get inside the opponents decision cycle. Information Warfare, however, is a

highly classified national level strategy<sup>47</sup> that has broad political, social, and economic applications across the entire foreign policy spectrum. As IW and C2W have developed there has been some uncertainty as to the relationship between the two. Is C2W a subset of IW or vice versa? More and more C2W is discussed in terms of the military application of Information Warfare<sup>48</sup> and therefore a subset of IW. This seems to be the most reasonable approach.

Regardless! The area of concern for the combatant commander or JFC is the coordination and communication (or lack thereof) that exists between his C2W staff and the national level authorities implementing the national or strategic aspects of IW. This is vital to ensure that the strategic and operational efforts are coordinated and complimentary, if not completely integrated. If coordination between these two levels does not take place, not only will the integrated effect of the two efforts be jeopardized, but the very real possibility of working at cross purposes can arise.

**CONCLUSION.** C2W offers the combatant commander a powerful new war-fighting tool whose potential was clearly demonstrated during Operation Desert Storm. The coordinated planning and integrated execution of the five elements truly produces a synergistic effect that will allow the operational commander to attain C2 superiority over an adversary by "getting into his decision cycle".

Interestingly, the five elements in-and-of-themselves bring significant potential to the conflict. Ironically, should they not be fully integrated due to a weak C2 structure or one of the other impediments interference, it (C2W) will still have a noticeable impact on any conflict simply due to the inherent potential of the five individual elements.

By establishing a clear command relationship for the C2W officer, thereby establishing the most effective basis for integration of the five elements, focusing on heightened awareness of C2W through training, and ensuring communication and coordination with national level agencies dealing with IW, the operational commander provides fertile ground for C2W to develop into a potent war-fighting tool. This will in turn reap great benefits for the operational commander at the tactical, operational, and even strategic levels of warfare.

## NOTES

1. Joint Chiefs of Staff, Doctrine for Joint Operations, JP 3-0 (Washington: 9 September 1993), p. III-41.
2. Joint Chiefs of Staff, Joint Doctrine for Command and Control Warfare (C2W) Operations, JP 3-13 (2nd Draft) (Washington: 1 September 1994), p. I-1.
3. Ibid., p. I-3.
4. Alfred Price, The History of US Electronic Warfare (Westford, MA: Murray Printing Company, September 1984), p. 4.
5. JCS, Doctrine for Joint Operations, p. III-41.
6. Norman B. Hutcherson, Command & Control Warfare: Putting Another Tool in the War-Fighters Data Base (Air University Press: Maxwell AFB, AL, September 1994), p. 4.
7. Ibid., p. 21.
8. Ibid, p. 8.
9. Telephone conversation with LtCol John James, USMC, Joint Command and Control Warfare Center, San Antonio, TX., 10 January 1995.
10. JCS, Joint Doctrine for Command and Control Warfare (C2W) Operations, p. D-1.
11. William A. Luoma, "NETWAR: The Other Side of Information Warfare," Unpublished Research Paper, U.S. Naval War College, Newport, RI: February, 1994, p. 6.
12. Hutcherson, p. 44.
13. Joint Chiefs of Staff, Department of Defense Dictionary of Military and Associated Terms, JP 1-02 (Washington: 1 December, 1989), p. 265.
14. JCS, Joint Doctrine for Command and Control Warfare (C2W) Operations, p. IV-1.
15. Ibid., p. GL-21.
16. Ibid., p. IV-3.
17. Hutcherson, p. 25.

18. United States Special Operations Command, Psychological Operations During Desert Shield/Storm (Macdill AFB, FL: n.p., n.d.), p. 4-3.
19. US Department of Defense, Conduct of the Persian Gulf War Conflict: An Interim Report to Congress (Washington, July 1991), p. 24-3.
20. United States Special Operations Command, p. 2-8.
21. Ibid., p. 5-5.
22. JCS, Joint Doctrine for Command and Control Warfare (C2W) Operations, p. GL-18.
23. James R. Koch, "Operation Fortitude: The Backbone of Deception," Military Review, March 1992, p. 66.
24. John C. Scorby, "Operational Deception: Historical Retrospect and Future Utility," Unpublished Research Paper, U.S. Naval War College, Newport, RI: March, 1993, p. 4.
25. Luoma, p. 6.
26. Conduct of the Persian Gulf War, p. 24-2.
27. JCS, Joint Doctrine for Command and Control Warfare (C2W) Operations, p. GL-14.
28. Ibid., p. IV-5.
29. Ibid., p. GL-14.
30. Ibid., p. GL-15.
31. Hutcherson, p. 26.
32. JCS, Joint Doctrine for Command and Control Warfare (C2W) Operations, p. IV-7.
33. Ibid., p. IV-8.
34. Joint Chiefs of Staff, Joint Doctrine for Intelligence Support to Operations, (Washington: 12 October 1993), p. III-2.
35. Hutcherson, p. 28.

36. JCS, Joint Doctrine for Command and Control Warfare (C2W) Operations, p. III-3.
37. Telephone conversation with LtCol James McCarl, USCENTCOM, Macdill AFB, FL, 17 January 1995.
38. JCS, Doctrine for Joint Operations, p. II-11.
39. Hutcherson, p. 8.
40. U.S. Navy, Naval Doctrine Command, Composite Warfare Commanders Manual, NWP 10-1(Rev. A), (Norfolk, VA: August 1993), p. 9-1.
41. Telephone Conversation with LtCol James, Joint Command and Control Warfare Center.
42. JCS, Joint Doctrine for Command and Control Warfare (C2W) Operations, p. III-2.
43. Telephone Conversation with LtCol James, Joint Command and Control Warfare Center.
44. Gordon R. Sullivan and James M. Dubik, War in the Information Age, (Carlisle Barracks: Strategic Studies Institute, June 1994), p. 1.
45. Luoma, p. 5.
46. Alvin and Heidi Toffler, War and Anti-War: Survival at the Dawn of the 21st Century, (Boston: Little, Brown and Company, 1993), p. 140.
47. Hutcherson, p. 7.
48. JCS, Joint Doctrine for Command and Control Warfare (C2W) Operations, p. I-1.

## BIBLIOGRAPHY

- Hutcherson, Norman B. Command & Control Warfare: Putting Another Tool in the War-Fighters Data Base. Maxwell AFB, AL: Air University Press, September 1994.
- Joint Chiefs of Staff. Department of Defense Dictionary of Military and Associated Terms. Joint Pub 1-02. Washington: 1 December 1989.
- Joint Chiefs of Staff. Doctrine for Joint Operations. Joint Pub 3-0. Washington: 9 September 1993.
- Joint Chiefs of Staff. Joint Doctrine for Command and Control Warfare (C2W) Operations. Joint Pub 3-13. Second Draft. Washington: 1 September 1994.
- Joint Chiefs of Staff. Joint Doctrine for Intelligence Support to Operations. Joint Pub 2-0. Washington: 12 October 1993.
- Koch, James R. "Operation Fortitude: The Backbone of Deception." Military Review, March 1992, p. 66.
- Louma, William A. "Netwar: The Other Side of Information Warfare." Unpublished Research Paper, U.S. Naval War College, Newport, RI: 1994.
- Price, Alfred. The History of US Electronic Warfare. Westford, MA: Murray Printing Company, September 1984.
- Scorby, John C. "Operational Deception: Historical Retrospect and Future Utility." Unpublished Research Paper, U.S. Naval War College, Newport, RI: 1993.
- Sullivan, Gordon R. and Dubik, James M. War in the Information Age. Carlisle Barracks: Strategic Studies Institute, June 1994.
- Telephone conversation with LtCol John James, Joint Command and Control Warfare Center, San Antonio, TX. 10 January 1995.
- Telephone conversation with LtCol James McCarl, USCENTCOM, MacDill AFB, FL. 17 January 1994.
- Toffler, Alvin and Heidi. War and Anti-War: Survival at the Dawn of the 21st Century. Boston: Little, Brown and Company, 1993.

U.S. Department of Defense. Conduct of the Persian Gulf War: An Interim Report to Congress. Washington: July 1991.

U.S. Navy, Naval Doctrine Command. Composite Warfare Commanders Manual. NWP 10-1 (Rev. A). Norfolk, VA: August 1993.

U.S. Special Operations Command. Psychological Operations During Desert Shield/Storm. Macdill AFB, FL: n.d.