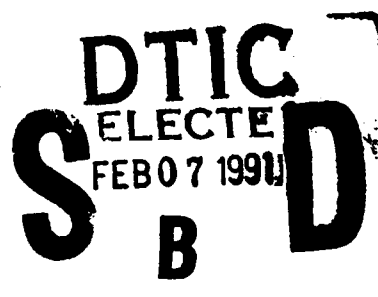


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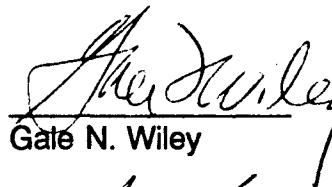
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**AN ASSESSMENT AND APPLICATION OF ADVANCES
IN COMMUNICATION TECHNOLOGIES TO
AIR FORCE PUBLIC AFFAIRS
PROGRAMS**

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**AN ASSESSMENT AND APPLICATION OF ADVANCES
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PROGRAMS**

by

BILLY ERNEST BIRDWELL, B.A.

REPORT

Presented to the Faculty of the Graduate School of

The University of Texas at Austin

in Partial Fulfillment

of the Requirements

for the Degree of

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December 1990

ABSTRACT

AN ASSESSMENT AND APPLICATION OF ADVANCES

IN COMMUNICATION TECHNOLOGIES TO


AIR FORCE PUBLIC AFFAIRS

PROGRAMS

by

BILLY ERNEST BIRDWELL, B.A.

SUPERVISING PROFESSOR: GALE N. WILEY



Military budgets and numbers of people in uniform will continue to drop in the coming years as changing world situations lower demands on the U.S. military. Public Affairs offices, the public communication/public relations arm of the military, however will continue to perform the same mission with fewer people. Modern technology increased the speed of human communication and made gathering and disseminating information easier. By using selected technologies, the Air Force public affairs practitioner can increase productivity while working with reduced staff. Computer communication, data bases, desktop publishing, cable television and electronic darkrooms make up some of the rapidly developing means of personal communication available. Throughout the 1990s these and other technologies can open communication doors for the Air Force.




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CHAPTER 1: BACKGROUND

The explosion in technology is transforming the communications field itself and its employment marketplace. Those with the right skills and personal savvy...may become part of an emerging group of elite technocrats.

— Philip R. Harris (1985a)

Purpose

Technology has been progressing at a geometric rate since the beginning of the 20th century. All aspects of American life have been affected, from agriculture to zoology. Communications, as noted by Harris, is only one area affected. Military communications, especially those related to battlefield use, have often been on the leading edge of technology. However, the same cannot always be said of military *public* communications. In communicating with community leaders, the general public and even its own members, the military's professional communicators often lag behind their private industry counterparts in using modern tools for disseminating information.

With defense budgets in the early 1990s facing hundreds of billions of dollars in cuts, resources for military public communications will drop along with other military areas. This does not mean the scope of communications will drop proportionately. Indeed, a swiftly changing military structure demands even greater communication:

- With soldiers, civilians and their families to keep them abreast of drawdowns, unit deactivations and base closures that affect their lives and careers;
- With legislators (at all government levels) to keep them informed about events that affect their districts and constituents;
- With community supporters to allow for planning community and business affairs to lessen negative effects drawdowns have on the economy;
- With the American taxpayer to communicate continuing funding needs and simply to inform the public.

While all branches of the military face similar communication problems, this work will focus on the United States Air Force and its Public Affairs (Public Relations) function. The need for increased communication mentioned above holds true, however, for the other services. Differences in structure among the services may affect uses of technolo-

gy and the approaches taken in communication. (In the Army, for instance, public affairs is a secondary career filled with workers from varied Army specialties, whereas, in the Air Force, public affairs is filled by specialists in the discipline. The Navy and Marines use variations on these approaches.) Due to the special relationship between this author and the Air Force, this work will give increased attention to that service branch.

Rapidly (and radically) changing political events in Europe and, to a lesser extent, in Asia, will have far-reaching effects on the United States and profound effects on the U.S. Air Force. One effect will be a draw-down of military personnel. At the same time, as noted before, the need to communicate with diverse audiences grows. Those who must speak to these audiences must be prepared to do so in the most efficient means possible. Public Affairs practitioners must constantly seek better ways to reach specialized groups in order to communicate the Air Force mission, its purpose and other information about the service. Such information can be vital to the nation's well-being. Are the long-used means of communication sufficient? Do new tools make the job easier or the results better? Are the new technologies cost effective? And,

what are the new technologies available to military Public Affairs practitioners?

GROWING USE OF TECHNOLOGY

Humans have long realized the power inherent in information. From the development of language to the invention of writing to the beginnings of modern "mass communications" with the diffusion of moveable type, humans have attempted to gain more information, gain it faster and retain it longer. Each technological advance builds on the previous with greatly increasing speed. Brody (1990) points out the rapid development of technology used in communications just in the past 155 years. He cites these landmark developments:

- 1835 - Morris' telegraph demonstrated
- 1876 - Bell's telephone begins distribution
- 1900 - First radio transmission of speech
- 1912 - DeForest's discovery of amplifying qualities of the vacuum tube
- 1920 - Establishment of regularly scheduled radio stations
- 1927 - AT&T demonstrates television

- 1941 - First commercial television broadcast
- 1942 - First electronic computer developed
- 1946 - Invention of ENIAC, the first mainframe computer
- 1947 - Invention of the transistor
- 1949 - Invention of the first stored program computer
- 1951 - Color television introduced
- 1956 - Videotape invented
- 1957 - First artificial satellite launched
- 1958 - First stereophonic recordings released
- 1961 - First push-button telephones marketed
- 1962 - Telestar communication satellite launched
- 1968 - Portable video recorder introduced
- 1969 - Manned space flight first guided by computer 3,000
times smaller than ENIAC
- 1971 - Invention of the microprocessor
- 1975 - Fiber optic transmission perfected; HBO began
transmission by satellite
- 1976 - Teletext use begins
- 1977 - First interactive cable TV system begun
- 1978 - First microcomputer marketed

- 1980 - Home computer prices drop below \$500
- 1982 - Successful multiple satellite launch

Other events could undoubtedly be added to Brody's list, such as the introduction of desktop publishing, the proliferation of commercial databases, electronic mail, the rapid (some might say 'rabid') wiring for cable TV systems, and the home satellite dish. And unlike the "life-cycle of a technology generation" proposed by Valaskakis (1982) in which technology goes through seven steps from invention through diffusion and into obsolescence, Brody points out that most modern communication products remain. Instead of disappearing, they continue to provide means of information transmission and they merge with other technologies.

As an example, consider the telephone. While still used for its original purpose of transmitting two-way voice, it has combined with microprocessors to transmit data between computers and is even capable of transmitting television programming via its new conduit of fiber optic cable. This retention of technology plus its merging with other technologies points out that humans demand more information and will use many means to get it. Information becomes valuable.

An anomaly, perhaps unique to telecommunications, is the inversion of common sense economics, in which scarcity and value move together. A communication system becomes more valuable as its scarcity declines — the more persons in homes, businesses and other organizations who can be connected, the more valuable is the service to all of them. (Boettinger, 1989)

The growth of the American communication network shows no signs of abating. One area of phenomenal growth and use has been in electronic data bases, especially among journalists. Miller (1988) pointed out though several case examples, the amount of information databases can provide and how it can be manipulated by reporters to extract data that can enhance a news story, or indeed, be the basis for news. (The *Atlanta Constitution* used federal loan databases to show housing discrimination. They then wrote a series on how they used databases to write the original series. Miller also showed how databases pinpointed cabinet members who belonged to all-white private clubs.) Miller noted, "The time is now ripe to pursue computer journalism. As an increasing amount of public information becomes computerized, the computers needed to analyze it are becoming cheaper and also faster." The Air Force has begun using data bases to "organize and call up information in quick response to inquiries" in their media relations area in the Pentagon. ("How the USAF Communicates," 1987)

This growth of technology use will only be slowed by two forces: user resistance and loss of capital. These forces work both in the civilian arena and in the military hierarchy. I shall discuss the latter force, loss of capital, first.

LOSS OF CAPITAL FOR COMMUNICATION EXPANSION

During 1989 world events shook the roots of Western military strategy. Nations in Eastern Europe, long dominated by anti-Western governments, replaced their leaders with pro-democracy people. Thus, within a matter of months, American congressional leaders began sweeping cuts to the U.S. military budgets — some as much as \$21 billion less than originally sought by the U.S. President (Price, 1990). The proposals will affect another aspect of communication: Loss of people. Some plans call for a reduction of military strength from 1990's 2.1 million military members to 1.6 million in uniform by 1995.

The loss of personnel and resources does not, however, reduce the importance of communication for the military. Publics outside and inside the military still need to understand local and national policies and their affect on the community.

The loss of funding and personnel has not been a totally recent occurrence, though. Brig. Gen. Mike McRaney, former director of Air Force Public Affairs, noted a recent 55 percent cut in publications budget and a staffing drop of two thirds over the last several years (How the USAF Communicates, 1987). He pointed out that the cuts underway in military public relations are reflected in civilian industry as well. Cluff (1987) recognizes, "As today's top management confronts rising manpower costs, shrinking markets, and volatile public opinion, communication is being forced to fight for survival in the corporation, along with everyone else."

These cuts come at a time when communication takes up more and more of a manager's time. Researchers Toth and Trujillo (1987) state that "communications activities account for as much as 90 percent of the corporate manager's time at work." Much the same is true in military circles.

FACING RESISTANCE

Not all barriers to technology come from shrinking budgets. Some comes from within the organization. Miller (1988) and Horton

(1989) discuss the fears people often have about using new technologies, especially computers. Some people see a loss of prestige and power when machines replace humans, even when the machines can perform the same tasks better. Horton says, "At first, people will complain bitterly about what using a computer requires them to do, but most are self-interested enough to change their ways."

The solution to resistance in the office is to keep improvements by users of technology constantly in front of the resisters. Thus they will see how adopting the technology will benefit them. Horton also emphasizes leadership by example and enlisting the aid of top management as important means of pushing through changes.

If so much time is spent in communicating, what can be used to improve communication efficiency? Is it possible to fulfill the oft-repeated military phrase: "We must do more with less"? The following chapter will deal with the types of technology available to the modern communicator to make creating, delivering and receiving information easier.

CHAPTER 2: TODAY'S TECHNOLOGY

Mention data processing today and most people think of computers, flashing lights, yards and yards of printouts, and complex multivariate statistics. Most people are wrong.

— Danielson (1989)

The military has long been a user of modern technology to communicate with its members and the world. Lowery and De Fleur (1988) relate the use of motion pictures early in World War II to educate and to motivate young recruits entering the war. The U.S. Army's *Why We Fight* series by Frank Capra marked a major beginning by the military to use technology to communicate with many people efficiently.

Since World War II, movies have been supplanted by other media, especially television, in disseminating information. Today's communicators have an arsenal of tools to use.

FOUR GROWING TECHNOLOGIES

The increase in rate of communication inventions noted earlier has had affects throughout society — public relations operations, civilian and military are no exception. However, some would say, public relations practitioners (military ones, especially) have been slow to adopt the latest in modern tools. Four of these technologies, although introduced several years ago, have recently burst onto military public affairs scenes.

Computers in Public Relations

In the 1980s, the Air Force began accelerating its purchases of microcomputers, local area networks, word processing software and other related materials. This began bringing the Air Force in line with its civilian counterparts. Wright's (1989) survey shows current high acceptance of computers in the public relations field. "Computers are second nature to public relations offices across the United States....," he said. "Overall, computers seem to be a fairly common office tool for public relations practitioners."

The reasons most often cited in this survey for using computers heavily were: "cost effective," "saves time and money," and "it makes profits." Computers have not replaced humans in the PR office, but their use can be equivalent to employing additional staff (Arndt, 1987) and can allow even small operations to compete with larger organizations. This ability to replace staff with machines may prove to be the computer's biggest selling point for Air Force public affairs offices. In the predicted drawdown of troops and civilian personnel, computers will be an inexpensive means of replacing the lost people. Indeed, the goal must be to increase the use of computers and expand ways they are used in public affairs offices.

Horton (1989) contends "that *computers* aren't important — *results* are." (Few would disagree with this observation, whether in the military or civilian side of public relations.) In discussing the benefits of using computers for many public relations tasks, Horton notes:

A reduction in support labor costs radiates throughout a firm. You need less space, less heat, less light, fewer premiums for employee benefits — and you can still provide the same or better service.

This ability to "do more with less" fits well with the needs of a dwindling Air Force Public Affairs career field.

With more than 600 microcomputers distributed worldwide in Air Force Public Affairs offices, few offices remain without at least rudimentary computing capabilities (AFNEWS, 1990). Most microcomputers are now vintage Zenith Z-100 or the more recent 80286-based Zenith Z-248. Although out-paced by the more modern 80386-based and 80486-based computers common today, the computing capabilities available to the typical Air Force Public Affairs office give workers access to many useful tools. Some of these include spread sheets, data base creation, electronic mail and even desktop publishing.

Electronic mail, slow to catch on, is beginning to gain larger acceptance within Air Force Public Affairs offices. With this system, Air Force Public Affairs offices, by using the Defense Data Network, can send messages to most other offices, receive news releases from military agencies and even review the day's top civilian news headlines. Plans (AFNEWS, 1990) call for expanded use of this system in the years ahead. (This area will be discussed more in a later chapter.)

Desktop Publishing Today

Stanley J. Wszola (1987), technical editor for *Byte Magazine*, a popular computer journal, said, "Very few developments in microcomputers have grabbed the attention of computer users quite like desktop publishing." Although only fully introduced to the public in 1985, desktop publishing has become an extremely useful development in the day-to-day operations of Air Force Public Affairs.

With desktop publishing (DTP), stories and page designs for the military base newspaper (an internal or "house" organ) can be quickly created. The completed pages can be transmitted via telephone lines to the printing company while base officials review hard copies of the pages produced on laser printers. Pages can be changed quickly to accommodate later breaking stories or to add information the commander deems important.

In spite of DTP's newness, the concept has undergone many changes. Out of the 32 DTP programs available in 1987 (Holmes), two have become standouts in commercial use: Aldus PageMaker and Xerox Ventura Publisher. Both have adherents and both are used in Air Forces offices, but Aldus PageMaker has gained in popularity (Wright,

1989) and has become the Air Force standard DTP program (AFNEWS, 1990)

While DTP does not change the message nor even the way we prepare the message, it does allow for some important changes in time spent on communication. Whereas before DTP, editors spent more time on design and layout than on writing. With the advances in DTP, editors and writers can prepare page designs in advance and "keep them on the shelf" from issue to issue. By electronically copying the designs, inserting stories and headlines and using other manipulation techniques of the programs, newspaper design time drops tremendously. This can prove especially helpful to young, inexperienced workers who are often called upon to edit military newspapers. By saving time in the newspaper design stage, staff members can spend more time shaping stories, researching stories and building source networks.

As noted earlier in the chapter, communication technologies grow and merge with others rather than disappear. This is no less the case with DTP. By combining with another technology — electronic mail — the desktop publisher can "capture" news service items and place them directly onto the news page without the labor-intensive stage of typing or typesetting the story. And by combining DTP with electronic file transfer,

editors can transmit entire newspapers to printers without needing to cut and paste copy, art and even photos.

As a time saver in the military public affairs office, desktop publishing has few equals. The base newspaper remains one of the most visible (literally and figuratively) products created by the public affairs office. Reducing time spent on the physical process of publishing and transferring that time to the process of improving content can only benefit the reader as well as management.

Data Bases

Communicators possess increasing power based on their control of information and their ability to use it "to influence and persuade" (Levitt, 1985). Joining Levitt's argument, this author has long contended that information is power. If this is true, then more information means more power. Economist John Kenneth Galbraith (Levitt, 1985) calls power the ability to impose one's will upon the behavior of others. This definition reflects Carl Von Clausewitz's military teachings. By using information the public affairs officer can exercise some influence over the audiences mentioned previously: troops, community leaders and others

in order to enhance national goals. One means of gaining more information is through the use of custom and commercial data bases.

One of the advantages of on-line data bases, according to Sam Yanes, director of corporate communications for Polaroid Corporation, is the ability to be proactive to developments instead of reactive (Turner, 1989). In addition, database use can also reduce staff time and internal expenses by making available same-day or next-day news clippings from major print media sources. Another strong application of data bases is in crisis management. "Product safety crises, environmental crises, occupational safety and health, explosions, natural disasters and legislative investigations are examples of situations where immediate access to information is essential" (Turner, 1989). All of these areas affect the Air Force from time to time.

What do data bases offer?

Besides the ability to manipulate raw data internally as mentioned earlier in Miller (1988), data bases available to the public provide access to whole libraries of information. Some on-line data bases include:

- major and special wire services
- dozens of major U.S. and international newspapers and news magazines

- full texts of the *New York Times* and *The Wall Street Journal*
- banking data
- Federal Government News Service
- TASS
- records from the U.S. Congress
- hundreds of other data files.

Some commercial data bases specialize in information important to public relations practitioners. PR Data Systems of Norwalk, Conn., maintains a data base of more than 40,000 media outlets and updates it daily. Media Distribution Services of New York also boasts of a 40,000-plus media outlet list, plus offers electronic mail service and other data services.

On a local basis, data bases can be used to maintain updated information on local community leaders; follow news trends; and track internal coverage of the different military units featured in the base newspaper.

Given the phenomenal growth of commercial and internal data bases, it seems reasonable to assume that the growth will continue throughout the decade with services become more diverse and speci-

fied. Commercial concerns directed at government activities with military subsections seem likely to appear. Military public affairs practitioners will need a strong knowledge of these systems to remain useful to the command structure. This usefulness can be in providing the latest in cleared information on economic impact of the military; or researching current policy statements on weapon's development for a commander's speech; or other such uses that demand timeliness and accuracy. In a defensive mode, reporters use databases. The public affairs officer who fails to be as prepared as the reporter in an interview, can quickly appear to be evasive or worse, uninformed.

Teleconferencing

The latest means to sweep into the communication arena, teleconferencing has shown tremendous growth in the late 1980s and into 1990. Teleconferencing encompasses audio conferencing (the conference telephone call begun in the 1960s), digital conferencing (in effect, having several computers hold a conference call) and the most glamorous, video conferencing.

Gordon and McGoon (1987) said, "Today applications [for teleconferencing] have skyrocketed, and costs have dropped by one-half." This brings teleconferencing, and especially video conferencing, into reach of more people and organizations. The 30 percent growth in private TV networks just from 1989 to 1990 (Here's BusinessTV's, 1990) shows the acceptance of the expense of setting up an internal video network. Used for more than expensive meetings, video conferencing allows businesses and government agencies to produce and distribute news, training materials and sales announcements quickly and efficiently and at a lower cost than by using teams of travelers.

Ford Motor Company, for example, uses its Ford Communications Network (FCN) to link its North American sites to transmit a continuing

flow of information throughout the company. Glenn E. Ray, a business communications specialist for FCN, says that "FCN produces a daily seven-minute newscast delivered by closed-circuit satellite for delivery throughout Ford's North American infrastructure. We also produce a monthly 10-minute video magazine focusing on issues important to employees" (G.O. Ray, personal interview July 30, 1990). Ford is only one of a growing number of businesses, religious organizations and government agencies developing their own networks. However, Ford is a good example of the ways organizations use teleconferencing, especially video conferencing.

Calling video conferencing "an essential and routine function of corporate and industrial communications" (Ford Motor, 1988a), the company offers two types of productions: point-to-multipoint and point-to-point (Ford Motor, 1989). Point-to-multipoint is less interactive than point-to-point. The former broadcasts the live program to many locations. At the receiving end, viewers can telephone the originator to pose questions and make comments, similar to a live radio or TV talk show. In point-to-point, both the originator and the recipients see and hear each other through the same system. Point-to-point requires more sophisticated studios, which Ford is fielding.

Ford claims (Ford Motor, 1988b) video conferencing "increases productivity, improves communications patterns, promotes a greater understanding between geographically-separated components and saves time, travel, duplication and distribution expenses."

Hal C. Schade is director of the United Services Automobile Association (USAA) news bureau in its San Antonio, Texas, headquarters. USAA, a major national insurance agency, depends heavily on video conferencing, interactive cable television and satellite communication. Schade says his company uses the its video communications to "enhance corporate travel, not eliminate it. (Many people consider travel a 'perk' and don't want to see it completely eliminated.)" (H.C. Schade, personal interview, July 5, 1990.) Still he cites video conferencing's ability to bring together specialists from several departments to discuss a pressing topic with a traveling team on location as the technology's greatest asset. There are "people we wouldn't send on the trip anyway, but it allows their resources to be used at the distant point," Schade said.

Schade also lauds video conferencing's speed. Immediately following the San Francisco earthquake of 1989, USAA headquarters began a video conference with their Bay-area office to coordinate the

company's response efforts. (California participants in the exchange continued to feel after-shocks throughout the hookup.) This allowed USAA to honor claims even as rescue operations were still underway. It also allowed the public relations department to respond quickly to area media inquiries. USAA's system is more sophisticated than the one Ford uses. At USAA the video conferencing equipment uses the "audio-follows-video" concept. In this way, when one person speaks, all locations see the speaker. As another person speaks, all video images switch to the new speaker.

Except in the headquarters of a few major commands, the Air Force has not widely used video conferencing. This may be affected by the cost of installing the equipment plus the tradition of sending workers TDY (on temporary duty) to the field location. However, as travel costs continue to climb, the Air Force should look to teleconferencing more to save more money and better use time.

Teletext

Teletext and videotext are two samples of transmitting written information via cable to the receiver's television. Videotext is more

interactive than teletext (Brody, 1990, pp. 97-99). In both systems users are able to view printed information transmitted from a central computer to a personal television. Teletext systems only allow the user to choose from a limited offering of information presented on a rotating basis. Videotext allows the user to choose from a wider range of information available at the user's discretion. Often readily available on cable TV systems, neither is widely used in the United States. Both, however, may prove more useful in the next decade due to the vast amount of information accessible via fiber optic cable.

Some newspapers experimented with electronic publishing via teletext earlier. These experiments proved economically unfeasible and have been abandoned. Using the concept could be beneficial to Air Force communication, however. With the wiring of most Air Force bases for cable TV, it is possible to include electronic publishing to the system to provide housing residents with a television version of the base newspaper updated more often than the typical "hard copy" version of the periodical.

Cable television (CATV) poses many of its own problems for the military public affairs officer. Even so, cable TV opens another avenue for moving information between the military and its audiences. A more

detailed look at cable TV and recommendations for military cable franchises will follow in chapter 4.

CHAPTER 3: FUNCTIONS OF MODERN MILITARY PUBLIC AFFAIRS

"What we're really doing is waging an information war. We must not fail to explain our requirements to the American people."

— Col. F. W. Smullen (in Fetig and Rixon, 1987)

Before entertaining arguments for adopting certain technologies for use in military, especially Air Force, public affairs, one must understand the purposes of the career track. (While the activities described below *generally* apply to all U.S. military services' public affairs organizations, each service is somewhat different. The following pertains *specifically* to the Air Force.) More than just the Air Force's public relations arm, public affairs holds broad responsibility for advising commanders and maintaining communication channels at all levels in the service.

Since 1979 when each service renamed its information offices as public affairs offices, an emphasis has grown in communicating with various publics before activities take place rather than reacting after the event to provide information. While a three-pronged approach (media

relations, internal communication and community relations) remained as the typical operational design, new emphases on being "ahead of the action" developed. Rather than providing a statement after an event took place, public affairs officers (PAOs) stressed the need to announce events before they occurred. PAOs also stressed to commanders the need to keep community leaders (and even unfriendly organizations) informed about military developments and activities. For only through open communication with the media and community leaders could a military base hope to foster pleasant local relations. Likewise, an all volunteer force required open communication to prevent troop dissatisfaction (and therefore mass exodus). Gone were the days of issuing a news release when called by a reporter or only printing puff stories on base events. Commanders began to rely more on communication experts when faced with probing questions concerning equal opportunity, environmental hazards and flight safety. This desire to work ahead of activities continued to grow until it has become the standard procedure desired of all PAOs. Still, however, they accomplish this through the three-pronged approach (AFR 190-1, 1989) mentioned earlier. By reaching the media, the work force and their families and the community leaders, PAOs strive to create an openness with each audience.

INTERNAL COMMUNICATION

Today's corporate communications, as Toth and Trujillo (1987) say, is more than publications and employee relations. Instead communications attempts to present the organizations "goals and character to many diverse publics" including those within the organization. While not abandoning the house organ (base newspaper), military officials also reach their troops, civilian employees, associated reservists and their families through a variety of means.

The installation newspaper still stands supreme in the arena. With 277 Air Force newspapers and magazines spread out over 140 major and 120 minor installations ("Installations," 1990) worldwide, one can realize that internal print media still comprise much of the Air Force communication efforts. (Of these publications 147 are active duty unit publications, 36 are Air Reserve publications and 94 are Air National Guard (ANG) papers. Reserve and ANG publications rarely publish more than monthly.) Most of the active duty unit papers publish weekly and vary in size from six to 48 pages. Most contain advertising and are printed without cost to the government. Others (mostly overseas) do not contain advertising and are published at government expense. In spite

of other technologies available to the commander, the base newspaper remains the primary means of internal communication between the commander and the troops.

In order to make this communication somewhat two-way, many newspapers publish a "commander's hot line" column where answers are published to questions called in by readers. Commanders also communicate directly with their troops through a commander's call which brings the unit together face-to-face with the commander. Public Affairs offices usually have significant influence on both these two-way media.

Finally, on some bases PAOs have responsibility for the commander's access channel on cable television. This usually consists of a repeating set of text messages announcing upcoming events. More discussions of base cable television will follow in later chapters.

MEDIA RELATIONS

Media relations has changed from simply issuing a printed news release following an event (although they still exist) to aiding national reporters and producers gather file and broadcast stories from far-flung areas of the world. During the production of this report, Americans

commonly watched live television broadcasts from extremely remote areas in a Middle Eastern desert. These events succeed partly because military PAOs form a bridge between military commanders and the media.

Some complain (Lunner, 1990) that the military fails in its support of the media, especially during deployments. Still in recent years the military has formed a national media pool to deploy with troops in combat situations. While the pool has been exercised several times, it has only been deployed once with troops during the initial hours of action: Operation Just Cause in Panama in 1989. The pool was delayed deploying to Saudi Arabia with the first American troops in 1990. Some blame the delay on the American government and others blame it on the Saudis (Lunner, 1990). Still, Operation Desert Shield in Saudi Arabia is the most extensively covered military action since the Vietnam War. While the Vietnam War brought the events into American homes for the first time, Operation Desert Shield can bring events into homes live, almost around the clock.

Dealing with media who can present news instantly, is only one aspect of media relations. Arranging interviews, news conferences and responding to disasters (aircraft crashes, natural disasters, etc.) form

other aspects of military media relations. These aspects are more traditional, in that they have been practiced for many years. High speed technology of modern news gathering adds to the PAO's duties.

Along with internal and media communication, goes community relations, the long-term communication efforts of the public affairs officer.

COMMUNITY RELATIONS

Internal communication can be compared to a household's daily living expenses like food clothing and shelter. Media relations could be compared to unscheduled expenses like a broken refrigerator, but community relations are the savings portfolio for the family. There appear few immediate results; however, after many years investments can a big dividend.

Military public affairs offices usually have someone assigned full time to monitor base activities that affect various community civic, educational and religious groups. In addition, base commanders often form a base-community advisory group composed to military unit commanders and community leaders. These groups meet periodically to discuss matters of mutual concern. In addition, unit commanders often join local business and civic organizations. This adds another level of communication between the military and the community.

Public affairs offices often operate a public tour program which gives many members of the community a chance to see military hardware and learn about the mission of the local units. Many of these tours are geared toward schools in order to inform young people about

military careers. These tours complement the base's prime public event, the open house.

Usually held annually, the base open house showcases hardware, units and military people. While the PAO seldom directs the activities of the open house, the PAO gets greatly involved in planning, publicizing and evaluating the event. Drawing crowds often in the scores of thousands, the open house displays the local base like no other event.

PUBLIC AFFAIRS SCOPE AND SIZE

Even with the varied duties of the public affairs office, few people actually are assigned to the career field. Out of approximately 800,000 active duty and reserve Air Force members, only 1,772 officers and enlisted members work in public affairs ("USAF and Air Reserve Forces," 1990) world wide. This includes editors and staffs for all 277 base-level newspapers and magazines; community relations workers and media relations workers as well as their counterparts at higher headquarters. While many officers enter the career field with degrees in a communication-related field, some have no formal background in the discipline.

Enlisted members come from all walks of life and may or may not have any experience or training in communication.

To compensate for the varied backgrounds, public affairs workers attend several weeks of intensive training at the Defense Information School in Indiana. Here they learn the fundamentals of the career field and practice news writing, editing, desktop publishing, media relations, interviewing, community relations and other aspects of the job. Much of the training, however, comes from working in a public affairs office.

Two other career fields are related to public affairs and often assist in internal and external communication: broadcasting (mostly overseas) and visual information (audiovisual services). Broadcasters provide television and radio news and entertainment to troops stationed outside the United States. Visual information provides photographic and some video support to public affairs offices. A detailed discussion of these fields goes beyond the scope of this report except to point out that both rely heavily on modern technology. Broadcasting becomes involved in cable television and visual information uses modern photographic means, including some electronic darkroom equipment to transmit images. Discussion of both these technologies will follow in later chapters.

In summary, a public affairs office holds responsibility for important internal communication, media relations and community relations for the military unit. From newspapers to assisting civilian news media to providing tours to the public, the PA office covers lots of territory. With this background in mind, we can take a more detailed look at some of the technologies involved in Air Force public affairs.

CHAPTER 4: CABLE TELEVISION FRANCHISING FOR AIR FORCE BASES

*Even the original selection and organization of lines of
communication is limited by a number of conditions.*

— Carl Von Clausewitz

The military Public Affairs officer (PAO) faces problems daily dealing with communication. The PAO constantly looks for ways to make the job of communication easier, more efficient and successful. Recently more obstacles began to appear for the military PAO — budget cuts and personnel reductions without a subsequent reduction in the PAO's mission.

More than just increasing the stress levels of the PAO corps, these reductions can prove damaging for the image of the Air Force both with its work force and with the American taxpayer. The PAO's commander must communicate with the troops and their families, local community leaders and citizens, the media, higher headquarters and the staff. In reaching these groups, the commander depends on the PAO as the spokesperson of policy. Even though the Public Affairs office may suffer

from a 10 to 25 percent reduction in workers, the need to reach the same number of audiences remains. Internal base newspapers must still be published; base-sponsored community support committees must be nurtured; reporters must be answered; public tours must be conducted. A constant barrage of requests leaves the PAO no time to plan or even think. Working "smarter" just became harder.

This chapter is designed to make the PAO's job a bit easier by putting into perspective a complex communication issue facing the base-level Public Affairs officer. I will explain how bases franchise and oversee the operation of community antenna television (CATV or cable) systems on their property. The base cable TV system can reach most of the base work force and in some cases the off-base civilian community quickly and efficiently, thus saving time, effort and personnel.

CABLE TELEVISION — A BRIEF HISTORY

Cable TV began in the late 1940s (Baldwin and McVoy, 1988) in Pennsylvania and Oregon in order that small communities nestled in mountain valleys could receive TV signals from distant cities. A large "community" antenna placed on a mountain top captured distant signals

which were then transmitted by wire into the homes below. Often the systems began when local merchants saw the CATV as an enticement for consumers to buy TVs.

Growth remained slow for years. Only the small remote towns really needed cable. Cities and metropolitan areas could receive strong signals from local broadcast stations for free. For the first two decades of cable TV systems, the cable operators only provided the signals of the three closest network affiliates, sometimes resorting to microwave relays for really distant stations.

From its humble beginnings in the late '40s, cable systems grew to more than 700 in 1961, then to 2,750 in 1971 serving six million homes. By the end of 1990 cable will pass more than 80 percent of American homes and about 50 percent of all United States homes will subscribe to cable (Baldwin and McVoy, 1988).

During the early years of cable TV, government held little regulatory power over the industry. Even the Federal Communications Commission (FCC) refused to regulate the growing industry except in a most ancillary way. Only local governments, through their franchising power held any sway over the cable operators. Finally, however, in 1966, in a move to protect the budding UHF stations and to protect VHF stations in

smaller cities, the FCC extended its authority over cable TV. With this move, the FCC began several years of extensive rule-making that attempted to guide the cable industry into a nationwide grid of highly local, very sophisticated cable systems.

Many dreamed of a "wired nation" with full, two-way video communications, work places and shopping malls at home, and interactive entertainment. In addition planners envisioned heavy demand for local programming focusing on minorities, the arts, and community politics and activities (Smith, 1972). However, most of the dreams failed to materialize. Some were simply ahead of technology. Others proved financially infeasible. Low consumer demand also prevented many of these services from developing.

The FCC restricted cable TV many ways during its rapid growth period. These included regulation of rates, required carriage of all local broadcast signals, required local program origination and limited carriage of distant TV signals, especially those which might have a negative economic impact on local broadcasters.

From the mid-1970s until 1984 many of these limits were abolished either in the courts or through the FCC's spirit of "deregulation." Finally, in the Cable Communications Policy Act (1984), Congress enact-

ed legislation that greatly opened the freedoms of the cable TV industry. The Cable Act granted the cable operators freedom to set rates, import distant signals with little restriction and made it much easier for them to renew their franchises.

By early 1990 Congress began looking to place some restrictions back on the cable industry. Many observers expect rate regulation to be imposed soon, perhaps by the end of 1990. The FCC also began debating its possible authority to regulate rates (Carnevale, 1990) even under the 1984 Act. FCC Chairman Alfred Sikes ("Conference of Mayors," 1990) said the Commission may be able to establish procedures "that might result in more cable price regulation than we've seen." Congress has been prompted by constituents' complaints of skyrocketing rates and poor service.

CABLE TELEVISION AND FRANCHISE AUTHORITIES

One area where government still exercises some control over cable operations is in the franchise agreement. Since governments own the streets and often the utility poles in a community, cable operators must acquire permission from the local government to use these rights of

way. At an Air Force base, the person with authority to grant use of the right of way is the base commander. (As the person responsible for the base, the commander assumes powers represented in municipal government by the city council, city manager and mayor, all in one.) It is the power to control the rights of way that give city governments, and base commanders, power to negotiate with rich cable operators. Trainor (1984) noted that during franchise negotiations "...government if it chooses, can wield the upper hand in a franchise renewal process and stand a good chance of getting what it wants."

While an Air Force base is very different from a municipality, bases and cities share some common bonds in dealing with cable owners. Both bases and cities contain family housing areas, apartments and dormitories, retail outlets, medical, fire and police services, offices, and light industrial areas. Bases are often described to the public as "little cities." Therefore, base leaders face many of the same circumstances of cable operations as city governments. Indeed, Air Force Regulation 70-3 (1988), "Cable Television Systems on USAF Installations," discusses cable franchising using terms common with municipal governments. Terms such as "franchise fees," "rates," and "PEG access" are common to city franchises as well as Air Force base franchises.

With this commonality between a base and a city, I will discuss franchising in general with specific comments for the military's unique circumstances.

Cable systems can offer many things to a city (base) to enhance the standard of living and working. Besides the obvious ability to offer expanded entertainment, cable systems can transmit educational or training programs and electronic data, and can be the cornerstone for a fire and security system. Cable offers the ability: To transmit programming, local or network, to all or some subscribers; to provide channels for government routine and emergency use; and even to conduct, in a two-way system, polling of citizens.

Given the enormous potential of a cable TV system, granting a franchise poses a formidable task for any government. Singleton (1986) points out that "the award of almost any franchise can be expected to take a year or more." Periodic military transfers combined with long franchises makes the franchise process even more difficult. Before a franchise can be renegotiated, the original military representatives have moved, promoted or left the service. Fortunately, the Air Force developed a Model Franchise Agreement (MFA) (Air Force Regulation 70-3, 1988) on which base commanders can design their own agreements.

Because of its penchant for bureaucracy, an Air Force base may find it difficult to attract cable operators strong enough or willing to offer more than just entertainment. Jerry Lindauer is a senior vice president in Prime Cable Corporation, a company operating cable franchises throughout the nation. PCC holds the franchises to military bases in Alaska and Georgia. Lindauer (personal interview, April 18, 1990) said that while military bases are "very good cable properties" from a financial standpoint, they tend to be very bureaucratic and "dealing with [base] contracting officers can be very cumbersome." Prime Cable acquires military franchises only as part of package purchase of a cable system serving a local community as well as the base.

During the franchise process, base officials must remember the different publics they face. Trainor (1984) describes three main "interests" involved in the franchising process.

The corporate interest: Represented by the cable company, its officers and investors.

The political interest: Represented by the franchising authority (city council, base commander, etc.) and their staffs, supporters and gate keepers.

The public interest: Represented by citizens groups, or the base population and their organizations operating on the base.

Each interest has certain desires and holds certain powers. The *corporate interest* can refuse to seek a franchise and take its programming elsewhere. After all, Air Force bases are small compared to cities. Few bases can offer hundreds of households to the cable owner. Cable franchises mean more local jobs and an increase in tax revenues for local governments. (Cable TV service even on military bases is subject to local and state sales taxes.) Moreover, the corporate interest may include local business people, bankers and investors. These are the same people base commanders and public affairs officers seek out for community support. Unnecessarily alienating them will cause ill-will to develop toward the base.

The *political interest* seeks to protect the consumer while allowing a service to develop that will make life better, easier or more enjoyable for the residents. In addition, cable TV offers a valuable means for the commander to communicate with the troops, warn them of impending disasters, and tell them of new policies or mission changes. While a commander holds vast power over the operation of a base and can make many decisions arbitrarily, no commander wants to alienate the base residents with an unsatisfactory or weak cable system. At the

same time no commander wants a cable company that gouges the consumer in order to build an unnecessarily sophisticated system.

The *public interest* seeks to gain as much benefit from a cable system as possible at the least cost possible. The largest group is composed of individual subscribers. These people desire a certain level of entertainment programming as well as news, weather and sports. In addition, organized base groups such as spouse organizations, support groups, off-duty education groups, and hobby and sports groups need the means to publicize their activities.

All three "interests" must meet at a common ground before the cable franchise is completed. These interests change participants constantly. Between the time of the original franchise and the next renewal, many individuals will have changed. However, even with changes, the interests' needs will evolve more slowly. In some cases even the individuals in some interests may change little. In the Model Franchise Agreement in AFR 70-3, bases retain power over transfer rights. In recent years (Sterling, 1982) the only way cable systems could grow larger was to buy other cable systems, sometimes buying and selling small systems quickly. Therefore, with this clause in the regula-

tion, base officials could be facing the same individuals in the corporate interests more frequently than expected.

CABLE TELEVISION ON AIR FORCE BASES

In a December 1988 internal report prepared by the Air Force Service Information and News Center (AFSINC, 1988), 94 of 141 major Air Force installations worldwide were serviced by some type of cable TV operation. Most of these, those in the United States or its territories, were owned and operated by a commercial cable operator. Those not in the U.S. were owned and operated by the Air Force. The Air Force systems provided a means to retransmit Armed Forces Radio and Television Service (AFRTS) signals and allowed local announcements to be printed on a separate channel. Commercial cable services have yet to develop for overseas American bases.

The same AFSINC report stated that:

Fifty-three of the 94 reporting cable systems on base have contracted for a commander's access channel [Note: The equivalent of a Public-Education-Government channel for a city]. However, only 29 of those use it for programming on a regular basis, and most of them for character generator messages that require little or no manpower support. Thirty-six bases report they either own or have access to

equipment to originate programming, but much of the equipment is simple character generators with no videotape or film equipment. (AFSINC, 1988)

In addition the report showed a serious limit on financial support for the use of these commander's access channels.

Funding varies and is very limited...Several surveys commented that money and people are simply not available to do even a minimal amount of local programming. Only one base reported anybody assigned to cable television support fulltime and most said they use P[ublic] A[ffairs], A[udio] V[isual] S[ervice] or administrative personnel to update character generators on a regular but very limited basis.

Recent plans (USAF/SCV, 1990) call for dissemination of the monthly filmed magazine, *Air Force Now*, to switch to videotape in 1990. This production is an official source used to inform Air Force members about their mission, their comrades throughout the world and to announce policy changes. It is heavily viewed throughout the service. The switch to videotape will cut costs of the monthly production drastically. However, "particularly at the base level, public affairs should take an active role in helping make a government access channel available and in ensuring that it is used for a wide variety of internal information programming, including *Air Force Now*" (USAF/SCV, 1990). With this significant technological (and overdue) change in a major area of Air

Force internal information, the public affairs officer will face greater demands on financial and personnel resources. With budget and personnel cuts expected to continue for several years, the public affairs officer must seek ways to meet the increased demands of the commander's channel.

TAKING ACTION AT FRANCHISE RENEWALS

Both the Cable Act of 1984 and Air Force Regulation 70-3 (1988) allow governments to assess a franchise fee, pole rental fees, and administrative fees. AFR 70-3 candidly points out that "[p]rivate CATV operators generally will pass such charges on to subscribers. The Air Force, therefore usually does not impose such charges." The Cable Act allows a franchise fee of up to five percent of the annual gross revenues for the system. The Air Force usually waives franchise, pole rental and other fees in order to attract competing interests for the franchise and to lower costs to the base residents.

With increased use of the base cable system and dwindling resources, bases should consider imposing franchise fees. The Cable Act specifies that franchise fees must be used to enhance local program-

ming or local access, or to improve educational use of the system.

Therefore, even a modest franchise fee could generate enough income to support a part-time staff of, say, two administrative workers trained to operate character generators, video tape machines and simple video recorders and cameras. Air Force contracting officers working with the base public affairs officer and the base comptroller could establish a system to employ non-government workers (private individuals or a contractor) to operate the commander's access channel. This system could be included in the request for proposals for an initial franchise and in any negotiation during renewal.

In addition, the franchise can require additional government access for safety and security. For example, during the first five years of the 10-year maximum franchise, the cable operator could be required to connect base home smoke detectors into the central fire reporting station. Or the operator could be required to provide a security system using the cable for certain locations on the base. Both ideas could benefit the base by reducing the number of serious fires and allowing for a reduction in security personnel.

These proposals have definite drawbacks.

- Too many requirements on the franchise could discourage companies from seeking the franchise. As noted by Lindauer, while a military base is good financially, they can be bothersome.
- A heavy franchise fee will greatly increase the costs borne by the base subscribers. Military members have seen a number of benefits eroded in the past years. A belief that their own commanders are "soaking them" will add to that belief, thus reducing morale. In addition, a heavy franchise fee will drive up the cost and reduce the number of subscribers on the system.
- The people hired to operate the system must be trained and supervised. They must also have materials to use on the system. Providing these materials may prove difficult.

CALLING FOR ACTION ON CABLE TV

These ideas should be given strong consideration. Military personnel cuts will greatly affect public affairs. The number of workers available will decrease but the need to publish base newspapers, answer news media, conduct public tours and maintain good relations with business, educational and civic organizations will remain and grow. The military proverb, "We must do more with less," can only extend so far. (Its logical conclusion would be: "We can do the most with nothing.")

Therefore, alternate means of support must be sought. Franchise fees can be one method.

The 'Information Age' will leave military public affairs in the 'Dark Ages' unless there is a concerted effort to use the technology available. The effects of staying in the Dark Ages could easily be lowered morale, lost budgets and loss of well-trained personnel from all Air Force career fields. Cable TV is only one tool in the Information Age — but it can be an effective tool. Cities have shown that through strong effort all "interests" (Trainor, 1984) can be helped reasonably. Base cable systems offer much to the commander and the troops.

What began as a simple retransmission of broadcast fare developed into a means of communicating with hundreds of base residents — offering entertainment, information and security.

CHAPTER 5: COMMUNICATING BEYOND TECHNOLOGY

Despite the sophistication of much of the technology, the problems associated with making it do something that is wanted by people is in many ways more complex.

— Jon M. Maslin (1982)

So far this paper has dealt with uses of the technology. This chapter will discuss the "dis-uses" of technology — impediments to the use of high technology to the tasks of daily communication. Infatuation with hardware can lead to "fixing something that ain't broke." In another aspect, switching communication mediums from traditional newspapers and books to teletext and computer electronic mail, may require more than just transferring the material from printed form to electronic form.

IS NEW ALWAYS BETTER?

No. As Maslin said at the top of the chapter, making the technology do something useful, something desired by the user, is often the difficult part of the task. Technological developments in communications blossom at an exponential rate (as this author discovered so quickly while researching this report), even faster than organizations can adopt them much less adapt to them. However this gulf between innovation and adaptation will not slow innovation.

Sending electronic mail to co-workers in other offices may be efficient, but doing so with workers at the next desk is not. Also, spending valuable time desktop publishing a simple memo would prove wasteful in most organizations. Electronic media have certain advantages, but they can restrict information flow when dependence on them is absolute (Line, 1980) or near absolute.

Maslin also points out that "there are much wider implications because the whole of society will need educating into new ways of obtaining and creating information. There is a greater need than ever before to study the complete presentation of language and meaning." Does the news take on a different meaning when presented electronical-

ly? Will media effects increase, decrease or stay the same when news stories are only viewed by selected topic (i.e. when readers only call-up subjects of interest and never read the day's "top stories.")? As audiences become more and more fragmented, the term "top stories" may become archaic as readers choose their own top stories.

Still, as pointed out in an earlier chapter, communicators have rarely dropped a medium, rather they have incorporated it into the next technological step. While desktop publishing makes production of newsletters, newspapers and magazines easier, printing the documents is still commonplace. And while electronic mail grows in usage, the old-fashioned telephone call is still far more common. Even in academic circles, professional organizations continue to print journals rather than distribute them electronically.* The use of older forms of communication (printing, hand-written notes, telephoning, and even face-to-face conversation) continues to flourish even while other means grow. This indicates

*Perhaps this is based on the printed version's portability. Also likely is the linear aspect of the electronic journal. One cannot skim a professional article or read its sections out of order as easily on a video screen as in a hand-held periodical (Line, 1982). While this linear aspect can be overcome with sophisticated software, adding this element may actually increase the resistance to electronic publishing by making it more complex.

that humans desire communication tools that prove useful, not just innovative.

RESTRICTIONS ON TECHNOLOGY

As noted, not everything lends itself to technological innovation or transfer. Line (1980) points out that technology should be "used to extend rather than restrict the range of media available" while at the same time arguing that "advances in information storage and access are not necessarily desirable for all forms of material."

The material itself can put restrictions on the medium. Electronic publishing has the tremendous advantage to recall and search through material quickly, excluding unwanted matter. But in order to search through written material, it must be able to recognize key words and phrases, discriminate between desirable data and unwanted information and present its results in a comprehensible manner. Not only must it be gathered and presented, it must be usable, that is, put in such a form that humans can and will use. A common, albeit low technology, example of a usable gathering of information is the daily newspaper. While it requires the reader to scan the headlines and sections seeking useful

information, it presents the material in a manner that makes this process easy. The newspaper's low cost and portability add to its usefulness to humans (Line, 1980) in spite of its "low-tech" image.

Electronic publishing, on the other hand, can be programmed to ease the search for information, but at a greater cost (at least for now). Many of the commercial data base organizations mentioned in an earlier chapter provide "clipping services" for a number of newswires and daily newspapers using criteria selected by the user. These services, however, cost more than the typical newspaper. Their benefit comes from the automatic searches, thus freeing the user for other, supposedly more important, activities.

Once the information is retrieved, it must be consumed (read), analyzed (contemplated) and stored (filed away for future use). Electronic publishing has great advantages in the third category. Entire newspapers can be stored on small computer diskettes. This eliminates the need to print massive tons of newspapers and disposing of the subsequent waste. This storage advantage gives electronic publishing an advantage in the second category: analysis. By storing the information electronically, humans can manipulate the information, yielding compari-

sons and providing data for conclusions. However, the first step, reading, remains the most difficult.

To read an electronic publication, one must either be restricted to the geographical location of the computer screen or print the results on paper (thus diluting the storage benefit). While this may be a minor inconvenience, the biggest drawback comes from the computer screen. It does not allow for non-linear scanning. Line (1982) has called for a restructuring of presentation styles to allow for non-linear scanning of published materials. Writers (or design editors) would need to structure information in such a way as to allow readers to skip through the material from main point to main point without having to resort to printing the document. On more formalized material (such as professional journals) this could be readily accomplished by providing an electronic menu to select the abstract, the conclusions, the background, etc. in any order the reader chose. In more informal writing, such as a newspaper, editorial judgement would be required to break the articles into main points, important quotes and other details. While this could be accomplished using today's technology and imbedding hidden codes in commercially available stories, I contend readers simply have not reached the technical sophistication nor do they have the desire to

gather information in this manner. (It could be argued (as Line does) that scholarly journals could easily be successfully published electronically. Some lower circulation journals indeed may not survive spiraling printing costs. Electronic publishing may become their salvation.) Another option would be to change writing styles for news. Instead of the classic inverted pyramid of lead, main points, background and detail, stories for electronic newspapers may need to be written more editorially — lead, conclusion, main points with details available as an option. This rather radical change from standard, non-editorialized news writing may be difficult for readers as well as journalists to accept.

Modern technology will someday replace the printed word as the main form of word presentation, however, that day is still far from being here. The high portability of printed publications and their current low relative cost still make them more popular than the same information presented electronically. In addition, the ease with which readers can scan printed material versus the linear construction of electronic publishing add to the strength of "low-tech" printing. This does not mean that organizations should back away from using technological innovations to communicate with their people. (To say such would be like commanding the tide to recede.) We have come too far to slow down or go back.

Through imbedded codes and key topic referencing, however, publishers can continue to expand their ability to present information for their users in a progressively more sophisticated way. If the use of embedded codes becomes less useful, writers, presenters and producers may need to turn to restructuring writing styles. This could require a change in classical journalism and other forms of writing.

However, a more detailed discussion of the stylistic changes which may follow a more universal adoption of electronic publishing, extends beyond the scope of this report. Theoretical development of this topic deserves investigation, but will be reserved for other researchers at other times. A more germane area deals with how large organizations, like the military, can use modern technology to improve communication. Currently the United States Air Force prepares to embrace many of the areas previously presented. The following chapter will discuss these efforts and add proposals for improving on the current path. In addition I will revisit a discussion on cable television adding how it can be used to improve communication and troop morale, especially in overseas locations.

CHAPTER 6: AIR FORCE PUBLIC AFFAIRS JOINS THE INFORMATION AGE

Successful innovations require both technical feasibility and customer acceptance. . . Distinctions between audio, data, video and fax will disappear, and separation between content and facilities will become increasingly blurred until ultimately irrelevant.

— Boettinger (1989)

In 1987 public affairs (public relations) leaders in the U.S. Air Force began a major program to bring all public affairs offices worldwide into a sophisticated communication network. With the state of the art already far beyond anything then current in their offices, the leaders realized they had many technologies to consider and many, far-reaching decisions to make. They also realized that the time to move into the advancing information age had passed — they had much catching up to do.

This chapter will cover the choices the Air Force made for its Public Affairs (PA) offices; where those choices are leading; what choices

are left to be made; and which choices should be made. This chapter will not only cover advances in computer-aided communication, but will re-visit cable television and discuss how public affairs officers and their commanders should be using this medium to present more information and morale-building entertainment to military members overseas.

DESKTOP PUBLISHING: THE FIRST STEP

With the advance of desktop publishing beginning in the early to mid-1980s, some public affairs offices began to use high speed technology to produce their installation newspapers. This development began at the bottom on the command chain with the newspaper publishers themselves.

(Most military installations publish an internal newspaper, usually in cooperation with a local civilian publisher. The publisher prints and distributes the newspaper at no cost to the government or subscribers, covering expenses and profits through advertising sales. The installation public affairs office provides editorial content and design. This arrangement benefits both the military and the publisher. When possible, this type of arrangement extends to overseas installations. When impractical,

however, overseas bases publish the newspapers themselves without advertising.)

The civilian publishers of these newspapers, under increasing pressure to increase efficiency and cut costs, began offering the military free use of computers and software to produce their weekly newspapers. These efforts began modestly, impaired by the high cost of equipment. However, as hardware prices dropped and software became easier to use, more and more publishers began switching to desktop publishing. The types of equipment and software used varied widely. Even the use of the desktop publishing varied widely with some bases using the latest in technology while others used older technology and others still relied on producing stories on typewriters and page design on paper dummies. In spite of its military hierarchy, the Air Force failed to direct procurement of equipment. Nor did it set standards for desktop publishing software and computer protocols. Not until the late 1980s did the Air Force begin to evaluate the direction of desktop publishing and computer communication in public affairs offices.

By then desktop publishing, where used, had taken several directions. These included using Apple computers and software; IBM (and similar) MS-DOS-based machines; video display terminals (VDTs)

attached to the publisher's main computer via dedicated telephone lines; and even tape-punch terminals for use on the publisher's typesetting machines. Although the problem is less pronounced now, at the time these systems were almost totally exclusive among each other: something produced on one system was unusable on any other system. This added to the frustration of those units attempting to share information with others.

Standardization, especially in desktop publishing, is critical. In May 1987, the Air Force Service Information and News Center (AFSINC, now AFNEWS) called the first service-wide computer communication conference. While no standards were set during this conference, work toward standardization began. The goal of standardization centers on reducing costs: training costs, purchasing costs and maintenance costs. Heller (1990) says training "is THE number-one hidden cost of computing and can add up to more than the price of the equipment itself." With standard systems and software, military transfers would not cause the newspaper production to suffer. That is, as members move from base to base, they discover the same desktop publishing system at each location, allowing them to move into work more readily. Reducing purchasing and maintenance costs is self-evident in a large organization

like the Air Force. Massive contracts with competitive corporations can cut per-unit costs of equipment tremendously. The military realized this early in the 1980s and has awarded several contracts since then for personal computers for use throughout the services in various career areas.

DTP Standards Set

Standards for Air Force public affairs desktop publishing and several other areas began to take form early in 1990 (AFNEWS, 1990) with the publication of the first wide-ranging plan to cover computer systems in the career field. Beyond the discussion of hardware, the main accomplishment of the standardization was to name the commercially available Aldus PageMaker desktop publishing software as the accepted program to produce Air Force newspapers. (Although only introduced in 1985 (Aldus, 1989), PageMaker has become one of the most popular and versatile page design and layout programs available.

Looking beyond the immediate, plans must develop that will use DTP more efficiently. For example: On Air Force-wide issues, such as major deployments overseas, entire news pages should be completed at

the Air Force level and placed on electronic networks in finished form with graphics, maps and headlines designed. Not only would this save time at the user end, but would provide all troops with a similar core of knowledge, thus somewhat duplicating many of the functions of Capra's *Why We Fight* series from World War II. This, however, still uses 1980s technology.

Air Force DTP in 2001

Within this decade and early in the 21st century, the Air Force needs to develop or be ready to adopt developments in electronic publishing. As discussed in the previous chapter, electronic publishing would transmit the news directly to a terminal near the reader either in a teletext, videotext or other mode. We must watch for growth in the area of page design which could provide more than just text, but a complete electronic newspaper. By taking the abilities of the Aldus program a few steps further, we should be ready to provide the base newspaper in PageMaker-like design directly to terminals. As readers scan the headlines for news of interest, they could selectively enlarge chosen stories. News with special command-level interest could be programmed to

enlarge automatically, thus giving more emphasis to the story. Other headlines could flash or be in various colors, also to draw reader interest. Most of all, the news needs to be timely, updated often, with varied page designs.

As these technologies grow, so will the ability to gather information about the readers. Through electronic means, we could determine which stories gather the most readership, or which writers have the best readership (and train other writers to emulate their style). Safeguards must be used, however, to prevent gathering too much information about individual readers (the "Big Brother is Watching" syndrome) lest we invade privacy. Such invasion could easily lead to a loss of readers, open the government to litigation, and ultimately restrict the free flow of information.

JOINING THE ELECTRONIC INFORMATION FLOW

Air Force communication is far more than just publishing a weekly internal newspaper. Base officials must also reach into the community to respond to the news media, civic and governmental groups, visiting dignitaries and even local school students who want to "learn more

about jets" for a class report. In addition, public affairs workers must keep in touch with other base agencies and with their counterparts on other installations. Electronic communications can aid efforts to reach these people.

With the drawdown of military personnel in the 1990s, and with the need to continue to communicate with various groups, public affairs workers will be faced with the dilemma of working harder or finding ways to work smarter. Time spent attending coordination meetings, planning sessions and information briefings (often anything but "brief"), will need to be spent producing materials formerly produced by others in a larger military. Offices wired together and computer and facsimile news releases can enhance the flow of information. These beginning steps have already brought base organizations together to share war plans, public event planning, inspection reports, economic impact figures and many other topics. Properly used, these systems can become the prime information sources for newspaper articles on deployments, military exercises and recreation activities.

Toffler (1990) explains how such interconnections will save money and manpower. In Power Shift, he explains that the communication paths used today rely on fewer and fewer people. No longer must

commanders seek information from deputies (Harris, 1985b), who in turn direct managers to gather information, who in turn order subordinates to prepare responses, which must flow back up to the commander.

Instead, "a young employee at the very bottom of the ladder now can communicate directly with top-level executives working on the same problem; and, significantly, the CEO at the touch of a button can access any employee down below. They can jointly call up images, edit a proposal or analyze a spreadsheet — all without going through middle managers" (Toffler, 1990). Thus non-hierarchical information channels are beginning to permeate even the very hierarchical military services.

Public Affairs workers must be ready to exploit this shift in information channels. By using all available avenues, PA leaders can gather information quickly from a number of sources and send it directly to the commander. In the same manner, the base spokesperson can gather facts and distribute releases directly to reporters' news terminals via modems. (This author had access to just such a system to transfer information from a military base in Honolulu to the terminal of the local daily newspaper's military desk via computer-to-computer link.) However, this merely upgrades yesterday's technology. Whole new areas will

open that will allow information to move quicker from bottom to top and back; and from inside the military out and vice versa.

THE AIR FORCE AND THE ELECTRONIC DARKROOM

One area of recent change in the Air Force is in electronic photo gathering. This area is still under heavy development in the civilian arena as well. While photos have been moved by newswire for decades, the equipment needed to transmit the photos has been expensive, slow and cumbersome. That has already changed and will change more in the next decade. Producing the photos prior to transmission was also a slow and cumbersome undertaking. Besides the arrays of cameras, lenses and flashes the photographer used, news organizations also needed a darkroom and its equipment. To transmit the images in color, the organization also needed expensive and elaborate color separators. For the Air Force, this equipment was simply too expensive and complex for the limited needs of the service.

This has changed today. The modern photographer can carry everything needed to take, develop and transmit photographs in two portable cases. Associated Press photographer, David Breslauer, in a presentation before the Texas Journalism Student Congress in March 1990, demonstrated portions of the electronic darkroom. He carried a computerized photograph transmission system in a modified camera

case. The device, currently in use throughout the Associated Press, sends black and white or color-separated images, via telephone, to a newsroom where they are retransmitted to subscribers nationwide. Once received, he said, the photograph can be cropped, enlarged, reduced, enhanced and extensively manipulated inside a newspaper's computer. The image is then converted into a digital halftone for printing in the newspaper. The electronic equipment needed at the newspaper to receive the signals, takes up the floor space of a typical darkroom enlarger (without the darkroom) and can receive one photograph per minute and store dozens at a time.

In an effort to reduce the number of photographic technicians in the Air Force, and to reduce dependence on often over-worked laboratories, the Air Force should adopt the new technology exemplified by the Associated Press electronic darkroom and similar innovations.

Without a pool of photographs easily available, the electronic darkroom will be very limited. The Air Force, according to Dan Doherty, an Air Force computer system manager (personal interview, June 13, 1990) has begun to follow the example of the National Archives Photo Division. It has put their collection of photos onto compact disk for storage and digital retrieval. Their collection of photographs from World

War I to 1954 fit on only one CD and the photos from 1955 to the present on another. The Air Force photo repository in Washington is beginning to do the same. Eventually this could be available via computer link for download at bases worldwide.

However, the Air Force must plan to move beyond the current silver-based, analog photography to fully digital, electronic photography. Working prototypes of digital photography are in use today, their results remain inferior to standard photographs. However, within a few years, digital photography will surpass current technology and open the window to the Air Force to shoot photographs of late-breaking events on base and transmit the photos directly to the military newspaper editor or the local daily newspaper directly from the scene of the event in near real time. Since the images would be sent over standard telephone lines, the photographer could be almost anywhere in the world and transmit images to the home base or central headquarters for release to the media.

With decreased manpower, the military may have little choice but to embrace the electronic darkroom, if photographs are to remain an integral part of the public release program.

BUILDING AN ELECTRONIC GRID

Gathering photographs from around the world; writing stories of wide appeal; and collecting information on civic groups will be of little use without a way to disseminate that information. Many corporations have long been developing extensive computer networks (Hiltz & Turoff, 1978 and Smith, 1973) for many aspects of their operations. The Air Force has been a part of this growth. However, only in recent years have public affairs practitioners been a part of the computer communication club. Plans now exist (AFNEWS, 1990) to tie all public affairs practitioners into the worldwide Defense Data Network (DDN), an extensive system of information transfer used throughout the military.

Through the DDN officials will send news, background material, speeches, media news queries, responses, personnel data, biographies on civil and military leaders, budgets and other data. By using the DDN, public communication experts will also be able to offer their information to organizations outside the public relations department, again moving toward the electronic newspaper and electronic encyclopedia.

Plans must be expanded to require extensive training on uses of the DDN and other electronic data transfer forms. Multiple typing of the

same document, copying and mailing these documents, are time consuming and personnel-intensive activities. By extending DDN access to every desk and lap-top computer, moving documents electronically will save time and reduce manpower needs.

These systems, of course, must be geared for use during conflict (warfighting being a prime military mission), but not all the information sent out to the troops or the public deals with war. Indeed, some is to improve troop morale, to garner public support or to entertain military members and their families. In the next section we will re-visit cable television and show ways it should be used to improve morale for families far from the familiar surroundings of the United States.

AIR FORCE CABLEVISION, INC.

The potential of cable television continues to grow. Already few places in the United States have no cable access. Cable operations have also permeated most Western nations as well. However, American programming is rarely available on cable systems outside the U.S. The Armed Forces Radio and Television Service (AFRTS) often provides the only broadcast link between Americans stationed overseas and their

homeland. Programming is limited to one channel airing mostly entertainment shows one to two seasons old, current news and tape delayed sports. Commercials are dropped from all programs. (Surprisingly, military families overseas complain about the lack of commercials. Many claim they use commercials to keep current on cultural trends.) AFRTS also produces local military news, sports and weather programs and numerous public service announcements to fill commercial holes. The operation is extensive and professional.

In order to provide American military members and their families more information and entertainment possibilities, the Air Force (and other services) should seek civilian companies willing to operate on-base cable operations.* The discussion in chapter 4 centered on generating income through franchise fees. These fees could fund specialists to enhance the information deliveries on cable operations on *domestic* bases. The current argument is to begin commercial operations on currently existing, and under-used, cable systems at *overseas* bases.

*This would not end the need to broadcast AFRTS over the air. Even with anticipated drawdowns, some members will still reside outside military installations, though a greater percentage will be able to live within the confines of American bases.

Without the need to buy and install the cable, since the military owns this asset already, cable operations could more likely afford the risk of supplying cable programming to the relatively small audience within separate military bases. Groups of neighboring bases could let one contract in order to entice the operators by reducing the need for separate administrative offices and staffs. (Separate downlinks for each base might be necessary, however, depending on host-nation requirements.) From that point the operators could offer programming they secure commercially along with carrying AFRTS and reserving at least one channel for command information and another for teletext/videotext. The two command-reserved channels should be unscrambled for all residents to view without paying a fee. Teletext and videotext could be free or not, as deemed appropriate at the time.

Since the goal should be to increase the flow of information, the operator should be required to work into the cable schedule, national (U.S.), international and local news. The local news could be a retransmission of the AFRTS-produced broadcast. Commercials could remain in the operator's programming, since the shows would be commercially procured and not procured by the government. The system would not need to be as elaborate as commercial systems in the U.S. Three to six

channels beyond the basic AFRTS broadcast would be sufficient to keep service families in touch with their homeland. (Additional channels could tend to overcrowd the cable system, which also transmits base-wide computer data. This overcrowding will be lessened as bases replace copper cable with fiber optics.) The extra channels would also give the command additional communication channels. During local availabilities, the times cable and network programmers grant to the cable system for local advertisements, the overseas operator could transmit local announcements on teletext or by other means. The commander would also have the ability to override all channels when needed to broadcast information of great importance, such as military contingencies, local travel restrictions and weather emergencies.

All in all, operating a cable system through a civilian contractor offers many advantages to enhance communication for the command and to enhance morale among U.S. service members and their families stationed overseas. Logistical and host-nation details would pose some temporary delays (Baldwin & McVoy, 1988), but could be overcome in time. To allow the existing cable network installed on U.S. bases to be so heavily underused is wasteful in the extreme. To neglect to use cable TV, a powerful and diverse communication medium, to its fullest is

foolish. In the years to come, cable will continue to flourish worldwide and could become the prime means of distributing visual information well into the next century.

EPILOGUE

Technology has had a profound effect on how humans communicate, especially since the introduction of moveable type into Western culture. Technological developments in the past 150 years have been able to connect the entire world into an information system and have given birth to the Information Age.

Organizations have long known the importance of communication with people inside and outside the company. Large organizations, private and governmental, spend huge sums on communicating their messages to themselves, each other and the general public. The Air Force is no exception. The need to reach more diverse audiences more quickly has been a goal of Air Force public affairs practitioners for years. By looking to industry, the Air Force can find models to emulate in reaching these audiences. Industrial communicators can also present a model of communications in fiscally tight environments. In the waning years of the 20th century and the early years of the next, shrinking defense budgets will force a reduction in personnel and programs throughout the military. Like their corporate counterparts (Cluff, 1987),

Air Force public affairs communicators will be forced "to fight for survival" along with others in the military.

By proper and well-planned use of new, high-speed technology, satisfying the increasing demands for information, and entertainment, will be easier. The task is still and will remain formidable. Challenges remain.

One such challenge will be developing means to attract attention to one's message as it competes with hundreds of others daily. Spending time, effort and money producing information that goes ignored, defeats the very purpose of producing the information.

Baldwin and McVoy (1988) point out that few communication revolutionary developments have actually developed as their innovators predicted. Likely, the ideas made here will also not have predictable results. Researchers in the coming years will need to reevaluate uses of technology and further explore how humans use their ideas to communicate other ideas.

REFERENCES

Air Force Regulation 70-3, (October 24, 1988) Headquarters U.S. Air Force, Washington, DC, para. 6a.

Air Force Regulation 190-1, (March 1, 1989) Headquarters U.S. Air Force, Washington, DC.

AFNEWS (Air Force News Center) Report. (1990, April 12). Air Force Public Affairs Communications-Computer Systems Functional Area Plan. pp. 7, 9, 30.

AFSINC (Air Force Service Information and News Center) (December 22, 1988). Summary of Cable TV Availability Survey, Kelly Air Force Base, Texas. Unpublished raw data.

Air Force Regulation 70-3, (October 24, 1988). Cable Television (CATV) Systems on USAF Installations. Washington: Department of the Air Force.

Aldus Corporation, (Corporate Producer). (1989). PageMaker — Where Desktop Publishing Begins [videotape]. Seattle: Aldus Corporation.

Arndt, E. (1987 March). How to Use High-Tech in Starting Your Business. IABC Communication World, p. 33.

Baldwin, T.F., and McVoy, D.S. (1988). Cable Communication. Englewood Cliffs, New Jersey: Prentice Hall, 5, 6, 177, 310-312.

Boettinger, H.M. (1989). Telecommunications: From Future-Determined to Future-Determining. Futures, 21, 277, 289.

Brody, E.W., (1990). Communication Tomorrow: New Audiences, New Technologies, New Media. New York: Praeger, 33,34, 97-99.

Cable Communications Policy Act of 1984, Public Law 98-549 § 623, § 626, § 637.

Carnevale, M.L. (1990, March 19). Untangling the Debate Over Cable Television. The Wall Street Journal, sec. B, p. 1.

Clausewitz, C.V., (1976) On War, trans. and ed. Michael Howard and Peter Paret. Princeton: Princeton University Press, 346.

Cluff, S., (1987). The Changing Face of Corporate Communication. IABC Communication World, 4(6), p. 27.

Conference of Mayors, At the U.S. (1990, January 29). Broadcasting, 22.

Danielson, W.A. (1989). Data Processing. In G.W. Stempel III & B.H. Westley (Eds.), Research Methods in Mass Communication (p. 111). Englewood Cliffs, NJ: Prentice Hall.

Fetig, J.L. & Rixon, G. (1987). Military Buildup. Public Relations Journal, 43(6), 24-28.

Ford Motor Company, (1988a). Point-To-Point Video Conferencing. FCN Guide, company pamphlet.

Ford Motor Company, (1988b). Video Conferencing. FCN Guide, company pamphlet.

Ford Motor Company, (1989). Creative Services. FCN Guide, company pamphlet.

Gordon, G. & McGoan, C., (1987, March). How Should You be Using Teleconferencing? IABC Communication World, 4(4), p. 16.

Harris, P. R., (1985a). Management in Transition: Transforming Managerial Practices and Organizational Strategies for a New Work Culture. San Francisco: Jossey-Bass, 136.

Harris, P.R., (1985b). Future Work. Personnel Journal, 64, 6, p. 53-58.

Heller, M., (1990, September). Graphical User Interfaces: Hype No Longer. Computer Shopper, p. 126.

Here's BusinessTV's Class of 1990: The Best Companies in the Country
Use Business Television. (March/April 1990). BusinessTV, Special
reprint, pp. 12 - 17.

Hiltz, S.R. & Turoff, M. (1978). The Network Nation: Human
Communication Via Computer. Reading, MA: Addison-Wesley
Publishing Co.

Holmes, T., (1987, May). Make My Page! Byte, p. 160.

Horton, J.L. (1989). Workshop: Using Computers to Increase Productiv
ity. Public Relations Journal, 45(7), pp. 26-29.

How the US Air Force Communicates. (1987, May). IABC Communica
tion World, p. 14.

Installations of the US Air Force. (1990, May). Air Force Magazine.
p. 52.

- Levitt, L., (1985) Public Relations as a Source of Power. Public Relations Review, 11(3), p.3.
- Line, M.B. (1980). Some Questions Concerning the Unprinted Word. In P. Hills (Ed.), The Future of the Printed Word (p. 27-35). London: Frances Pinter.
- Line, M.B. (1982). Redesigning Journal Articles. In P.J. Hills (Ed.), Trends in Information Transfer (p. 31-46). Westport, CT: Greenwood Press
- Lowery, S.A. & De Fleur, M.L. (1988) Milestones in Mass Communication Research: Media Effects (2nd ed.). New York: Longman
- Lunner, C. (1990, November-December). Military Battens Hatches as Press Floods Persian Gulf. The Quill, pp. 10-12.
- Maslin, J.M. (1982). The Importance of Information in Information Technology. In P.J. Harris (Ed.), Trends in Information Transfer (pp. 13-30). Westport, CT: Greenwood Press.

Miller, T., (1988, September-October). The Data-Base Revolution: A Look at How Reporters are Making Use of a Powerful New Technology. Columbia Journalism Review, pp. 35-38.

Price, T. (1990, July 14). Panel OKs \$18 Billion Military Cut. Austin American-Statesman, p. A3.

Seybold, J.W., (1987, May). The Desktop-Publishing Phenomenon. Byte, p. 149.

Singleton, L. (1986). Telecommunications in the Information Age. (New York: Ballinger).

Smith, R.L. (1972). The Wired Nation; Cable TV: The Electronic Communications Highway. New York: Harper & Row.

Sterling, C.H. (1982). Cable and Pay Television. In B. Compaine (Ed.), Who Owns the Media? (p. 394).

Toffler, A. (October 15, 1990). Power Shift: Knowledge, Wealth and Violence at the Edge of the 21st Century, Newsweek, 116, 16, p.88-92.

Toth, E.L., & Trujillo N. (1987). Reinventing Corporate Communications. Public Relations Review, 13(4), 43.

Trainor, B.J. (1984). The Cable Television Refranchising Process in Austin, Texas — A Systems Analysis. Unpublished master's thesis, University of Texas at Austin.

Turner, T.L., (1989, October). On-Line Databases: The Professional Edge. IABC Communication World, 6(10), pp. 34-37.

USAF and Reserve Forces Personnel by Categories. (1990, May). Air Force Magazine, pp. 46-47.

USAF/SCV, (April 18, 1990) [letter to Headquarters FNEWS/II], Washington, D.C.

Valaskakis, K., (1982). Leapfrog Strategy in the Information Age. In H.F.

Didsbury (Ed.), Communication and the Future: Prospects,

Promises and Problems. Bethesda MD: World Future Society.

Wright, D.G., (1989). Practitioners Become Publishers With Desktop

Computing: Results of a Survey. Public Relations Quarterly,

Winter, pp. 19-22.

Wszola, S.J., (1987, May). Desktop Publishing: Introduction. Byte,

p. 148.

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