

**A REPORT
TO THE
HOUSE OF REPRESENTATIVES
ON
THE MILITARY AFFILIATE RADIO SYSTEM
(MARS)
BY
THE SECRETARY OF DEFENSE
DECEMBER 31, 1997**

In June 1997, the House National Security Committee, in its Report (105-132) on FY98 DoD Authorization, directed the Secretary of Defense to submit a report by December 31, 1997, identifying how the Department of Defense is utilizing the MARS system and recommending ways in which it can be expanded. Specifically, the report should:

1. Explain DoD oversight of the current program, identify how the individual service programs are currently organized and configured, and discuss possible mission expansion, contraction, or adjustments.
2. Identify ways to improve the reliability of the MARS system;
3. Recommend ways to integrate MARS resources in support of other government agencies, identifying options for interfacing and linking MARS with regular DoD communications resources and with other emergency communications resources and systems;
4. Propose ways to better organize, train, and utilize MARS personnel resources;
5. Identify necessary adjustments and realignments to the structure, staffing, and grade levels throughout the MARS program;
6. Provide an estimate of the costs to DoD of obtaining MARS-type services commercially or "in-house" using other active DoD personnel and identify the cost savings to the Department through the use of MARS; and
7. Identify the level of funding that will be required to institute each of the recommendations.

The Secretary of Defense respectfully submits the following report to the House National Security Committee.

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What is MARS

The Military Affiliate Radio System (MARS) is a Department of Defense sponsored program, established as separate managed and operated programs by the Army, Navy, and Air Force.

The program consists of licensed amateur radio operators who are interested in military communications. They contribute to the MARS mission providing auxiliary or emergency communications on a local, national, and international basis as an adjunct to normal communications.

MARS History

In November 1925, a few dedicated pioneers in the United States Army Signal Corps formed the Army Amateur Radio Systems (AARS). This organization continued until the start of World War II when operations were suspended. Army amateur radio was authorized to resume operations in 1946 and the Army Amateur Radio System was reactivated and functioned as such until 1948 when the Army and Air Force established the Military Amateur Radio System, later renamed the Military Affiliate Radio System (MARS). In 1962, the Navy-Marine Corps MARS program was launched making the MARS a joint service program.

MARS Mission

The MARS Mission is:

Provide Department of Defense sponsored emergency communications on a local, national, and international basis as an adjunct to normal communications.

Provide auxiliary communications for military, civil, and /or disaster officials during periods of emergency.

Assist in effecting normal communications under all hazard conditions.

Create interest, and furnish a means of training members in military communications procedures.

Provide a potential reserve of trained radio communications personnel.

Handle morale and quasi-official record and voice communications traffic for Armed Forces and authorized U. S. Government civilian personnel stationed through the world.

Conduct an appropriate Amateur Radio program as a part of the annual celebration of Armed Forces Day.

Policy

It shall be the policy of the Department of Defense to:

Support the MARS mission to provide emergency communications on a local, national, or international basis as an alternate communications capability.

Support and encourage the MARS and amateur radio activities and avoid, within the limitations imposed by military exigencies, any action that would tend to jeopardize the independent prerogatives of the individual amateur radio operator.

Recognize the military affiliation of the services provided by MARS volunteers when operating in an official MARS capacity.

Encourage and cooperated with amateur and private communications activities to enhance their military and civil value.

Maintain liaison with the Federal Communications Commission (FCC), major U. S. amateur radio organizations, and other volunteer emergency radio services.

Encourage inter-Service operation of MARS stations on a regular basis.

Support the MARS program's affiliation with appropriate Executive Agencies of the Federal Government.

Responsibilities

The Assistant Secretary of Defense (Command, Control, Communications, and Intelligence) (ASD(C3I)) shall provide overall policy guidance and advice to the Military Departments in matters relating to the administration and operation of their MARS programs, and shall be responsible for emergency communications initiatives with appropriate Federal Agencies, including the Office of the Manager, National Communications System (NCS), with regard to national security and emergency preparedness activities, and the civil volunteer communications community.

The Under Secretary of Defense (Acquisition and Technology)(USD(A&T)) shall ensure that the Deputy Under Secretary of Defense (Logistics) provides overall policy guidance and advice on matters relating to the management and standardization of the MARS supply and equipment program.

1. Explain DoD oversight of the program, identify how the individual programs are currently organized and configured, and discuss possible mission expansion, contraction or adjustments.

a. Explain DoD oversight of the MARS program:

DoD oversight of the MARS program consists of providing overall policy guidance and advice to the three Military Services on the administration and operations of their MARS programs. More specifically, under the provisions of Department of Defense Directive (DoDD) 4650.2, the Assistant Secretary of Defense (Command, Control, Communications and Intelligence) (ASD(C3I)) is responsible for providing overall policy guidance and advice to the three Military Services in matters relating to the administration and operations of their MARS programs, while the Assistant Secretary of Defense (Acquisition and Logistics) (ASD(A&L)) is responsible for providing overall policy guidance and advice on matters relating to the management and standardization of the MARS supply and equipment program as prescribed in DoD 4160.21-M.

The responsibility for the management, administration and operation of the individual service MARS programs, including acquisition, storage, distribution, and accounting for equipment, falls to the Secretaries of the Military Departments.

b. Identify how the individual programs are currently organized and configured:

DoDD 4650.2 directs that there will be an organized MARS entity within each of the Military Departments, with the Marine Corps entity

functioning under the jurisdiction of the Department of the Navy. The directive further states that each of the Military Department entities will function under the direction of a "Chief, MARS," who will be appointed by the sponsoring Military Department. Each MILDEP has fulfilled these requirements by establishing a MILDEP MARS program, and by appointing a "Chief, MARS" for each of the programs.

Each of the three MARS Chiefs is responsible for the day-to-day management and operation of his/her respective program. Each develops plans, policies, directives and procedures governing administration, operations, training, equipment and logistical matters, and frequency management. Each represents his/her own program at meetings and conferences chaired by a wide variety of federal, national, and state entities. Each administers an affiliate volunteer program which, when the three programs are combined, totals nearly nine thousand (9,000) volunteer licensed amateur radio operators worldwide who contribute to the success of the MARS programs by donating their time and the use of their equipment, and by acting as volunteer staff members at all levels to assist in the day-to-day operations and administration of the networks.

The **Air Force MARS** office is located at the Headquarters, Air Force Communications Agency (AFCA), Scott AFB, Illinois. The Air Force has a total of two (2) full-time salaried personnel assigned to their MARS function. The position of Chief, USAF MARS, which is a staff function of the AFCA, is a salaried Department of the Air Force (DAF) civilian position, as is the position of Accountable Property Technician. The Air Force MARS program has an affiliate volunteer population of approximately two thousand (2,000) members and 300 contingency military stations consisting of active, reserve and Air National Guard unit MARS stations. All other staff positions, including the managers of the USAF MARS regional and state programs, are filled by volunteers.

The **Army MARS** office is located at the Headquarters, United States Army Signal Command (USASC), Ft. Huachuca, Arizona. The Army has a total of four (4) full time salaried personnel assigned to their MARS function at Fort Huachuca. The position of Chief, Army MARS, which is a staff function of USASC, is a salaried Department of the Army (DA) civilian position. Additionally, the three other positions at USASC are also salaried DA civilian positions, with one additional position being a military enlisted position. In that the Army MARS program breaks its operations down into two separate "areas of operations" - an Eastern Area which encompasses 20 of the Continental United States and Puerto Rico, and the Western Area which encompasses the remaining 28 Continental United States as well as Alaska and Hawaii - two of the four salaried DA civilian positions are designated as Area MARS Director positions. Among the functions performed by the incumbents of the civilian billets

are administration and accountable property management. The incumbent of the one military position is involved in station operations. The Army MARS program has an affiliate volunteer population of approximately five thousand (5,000) members and several hundred contingency military stations consisting of active, reserve and Army National Guard unit MARS stations.

The **Navy-Marine Corps MARS** (which also includes the United States Coast Guard) office is located at the Headquarters, Naval Computer and Telecommunications Command (NAVCOMTELCOM) in Washington, D.C. The Navy has a total of four (4) full time salaried personnel assigned to their MARS functions at the NAVCOMTELCOM headquarters. One of these four, the Chief, Navy-Marine Corps MARS, is a salaried civilian position. The remaining three positions are active duty military, one of which is a commissioned officer with the other two being enlisted grade positions. The Navy-Marine Corps MARS breaks its operations down into seven (7) regions (or geographical areas) which encompass not only the Continental United States, but the Caribbean, Europe, Iceland, Panama, Hawaii, the Pacific area and the Indian Ocean area as well. At each of the seven regions is a senior grade enlisted position that serves as the Region Director. In addition to the four positions at the headquarters and the seven positions at the regions, the Navy-Marine Corps MARS program also has a Coast Guard and Marine Corps MARS Liaison Officer authorized. Although the Navy-Marine Corps MARS program concerns itself primarily with Navy and Marine Corps installations aboard ships and at overseas shore stations worldwide, its affiliate volunteer population is still a sizable one, albeit smaller than that of its counterpart in the Army program. The Navy-Marine Corps program operates an Afloat and Overseas Operations Program which specializes in providing phone patch telephone service to Navy and Coast Guard ships at sea.

c. Discuss possible mission expansion, contraction or adjustments:

As detailed in DoDD 4650.2, the **current mission** of the MARS is to provide DoD-sponsored emergency communications on a local, national or international basis as an adjunct to normal communications.

To accomplish this mission, DoDD 4650.2 directs the MARS Chiefs to:

1. Provide auxiliary communications for military, civil, and/or disaster officials during periods of emergency;
2. Assist in effecting normal communications under emergency conditions;

3. Handle morale and quasi-official record and voice communications traffic for the Armed Forces and authorized Government civilian personnel stationed throughout the world;
4. Establish programs to create civilian interest, recruit qualified volunteers, and furnish appropriate training in military communications equipment, techniques and procedures;
5. Initiate efforts to attain improvement in high frequency (HF) radio operating techniques and state-of-the-art technology through experimentation and testing; and,
6. Conduct an appropriate amateur radio program as a part of the annual celebration of Armed Forces Day in accordance with DoDD 5410.18.

Although changes are periodically made to these functional activities, the broadly stated mission of MARS continues to be valid. It is for this reason that **there is no requirement for a change in the MARS mission.**

In recent years, the MARS has become a key player in the national SHARED RESOURCES (SHARES) High Frequency (HF) Radio Program which was developed by the National Communications System (NCS) in its role of planning and preparing for national security and emergency preparedness (NS/EP). The purpose of SHARES is to provide a single, interagency emergency message handling system by bringing together the existing HF resources of Federal and federally-affiliated organizations when normal communications are destroyed or unavailable for the transmission of national security and emergency preparedness information. SHARES further implements Executive Order No. 12472, Assignment of National Security and Emergency Preparedness Telecommunications Functions. The SHARES network consists of 1,130 HF radio stations, representing 66 Federal, state and industry resource contributors. SHARES stations are located in every state and at 36 overseas locations. Of those 1,130 HF radio stations in the SHARES network, nearly 400 of them are MARS stations.

2. Identify ways to improve the reliability of the MARS system:

There are three major "elements" of the MARS system. First is the overall management structure - how the system is managed and administered. Second, there is the "technical element" - the equipment which is used in the system. Third, there is the pool of thousands of trained, dedicated volunteer civilian amateur radio operators who operate

and maintain hundreds of fixed and mobile/transportable stations throughout the United States and at overseas locations.

Two actions that can be taken to improve the reliability of the MARS system are (1) restructuring the overall administration and management of the system, and (2) expanding the availability of information on the latest state-of-the-art technology to the MARS membership.

Looking first at the issue of restructuring, the basic requirement is to make the management and administration of the MARS program more efficient. This can best be accomplished by going to a centralized management structure to eliminate the inefficiencies inherent in the three parallel stovepipe systems that exist today. Such a restructuring could be accomplished at minimal cost and, if done correctly, could well result in a decrease in what are already minimal operating costs.

A recommended approach for OSD is as follows:

1. No change would be made in the name of, or the mission assigned to, the MARS program from that which is currently contained in DoDD 4650.2;
2. The program management and administration by the three Service MARS staffs would be replaced by a single, centralized management structure; and,
3. An Executive Agent within the DoD would be identified to centrally administer and manage the MARS program. Based on the charter outlined in DoDD 5105.19 for the Defense Information Systems Agency (DISA), consideration will be given to naming DISA as the Executive Agent.

Benefits to be realized from such a restructuring include:

1. Manpower savings: Merging the three existing "stove pipe" staffs required to manage three separate systems into one centralized staff managing one system would result in a reduction of manpower.
2. Elimination of duplicate efforts: Duplication in the form of manuals, directives, publications, maintenance of data bases, and overlapping regional networks could be eliminated.
3. Improved coordination: Functions such as volunteer recruitment (a vital ingredient of the MARS program), training, exercise planning, frequency management and utilization, and scheduling of resources - both in normal periods as well as in periods of stress - would be better coordinated, with a resulting improvement in the reliability of operations.
4. Program modernization: With centralized administration, program management will be streamlined and modernized.

Looking at the issue of technology, every effort must be made to ensure that members are kept abreast of the latest advances in technology affecting high frequency (HF) radio. The

same explosion of technology over the last decade that has made capabilities like satellite communications, cellular telephones, personal computers, the Internet and e-mail, to name but a few, readily and easily available to almost anyone who wants them, has also resulted in quantum advancements in the capabilities of HF radio. Gone are the days when HF was limited to the transmission and reception of voice messages, or, at best, low speed teletype traffic. Among these advancements are the use of multiple microprocessors and Automatic Link Establishment (ALE), Digital Signal Processing (DSP), data compression techniques, and image compression and error correction capabilities, to name but a few. These advancements in technology have made HF radio more efficient than ever before, permitting the transmission via HF of not only high-speed, error-free facsimile traffic, but e-mail, text and data files as well. Even imagery - high-resolution color and monochrome images from analog, digital and still video cameras - as well as those from infra-red (IR) and radar sources, can today be transmitted via HF.

3. Recommend ways to integrate MARS resources in support of other government agencies, identifying options for interfacing and linking MARS with regular DoD communications resources and with other emergency communications resources and systems.

In reality, MARS resources are already being used to support other government agencies and to provide linkage with other emergency communications resources and systems through the SHARES HF Radio Program as explained in Part C of question 1 above. The very fact that the MARS presence in the SHARES Program represents over thirty percent of the total participants is in itself an excellent indicator of just how effective that integration and linkage already is. MARS also supports other Federal agency emergency communications plans and operations.

4. Propose ways to better organize, train and utilize MARS personnel resources.

This has already been addressed in detail in the answer to question 2 above.

5. Identify necessary adjustments and realignments to the structure, staffing and grade levels throughout the MARS program.

In view of the Secretary of Defense's efforts to reduce manning within the Office of the Secretary of Defense (OSD) and the defense agencies, the restructured, centralized staff would have to be kept to an absolute bare minimum, and would very probably be considered a strong candidate for competitive outsourcing.

Although it is not possible at this time to either assign absolute numbers or to project grade levels (should it be determined that some or all of the staff positions should be DoD civilian billets), it is anticipated that a restructured, centrally managed MARS program could be managed and administered by a staff that did not exceed six (6) people.

6. Provide an estimate of the costs to DoD of obtaining MARS-type services commercially or "in-house" using other active DoD personnel and identify the cost savings to the Department through the use of MARS.

a. Provide an estimate of the costs to DoD of obtaining MARS-type services commercially:

In developing the following cost figures, it was necessary to consider the following:

1. That the existing "pool" of 9,000 volunteers currently involved in the MARS program no longer exists.
2. That the services to be provided by a commercial entity are to be the equivalent of what is provided by MARS today, i.e., seven days per week coverage, twenty-four hours per day, on a worldwide basis.
3. That such services could be provided by no less than ten (10) "super stations" worldwide, each operating "full period" (twenty-four hours per day, seven days per week).
4. That it requires no less than twelve (12) trained operators (not including supervisory logistics and administrative support) to operate a facility with three operators per shift.
5. That the average hourly wage for a trained, skilled radio operator would be no less than \$15.00 per hour (not including benefits), or approximately \$31,000 annually (\$15/hour x industry standard of 2,080 hours per year, based on a forty hour week = \$31,200).
6. That the average hourly wage for a trained station supervisor/manager working five days a week, eight hours a day would be no less than \$20.00 per hour (not including benefits), or approximately \$42,000 annually (\$20/hour x industry standard of 2,080 hours per year, based on a forty hour week = \$41,600).

Under these conditions, the annual cost in salaries alone for just operating the stations needed to obtain "equivalent commercial service" for seven days per week/twenty four hours per day coverage would be nearly **\$4.15M** dollars per year \$31,000 annual salary x 12 operators per station x ten stations = \$3.72M + \$42,000 annual salary x 10 supervisors = \$.42M.

Added to this annually recurring base cost of **\$4.15M** would be the one time initial cost of equipment for each station, conservatively estimated to be **\$15M** (\$1.5M per station x 10 stations), as well as annual operating costs (other than salaries) such as rents, overseas pay differentials, benefits

programs, maintenance of facilities, maintenance of equipment, supplies, transportation, and overhead costs, to name but a few, which could run as much as an additional **\$7M - \$9M** annually.

Therefore, the estimated annual cost to "obtain equivalent services" from a commercial source would conservatively be between **\$11.15M and \$13.15M**, which would, of course, be preceded by initial first year start up costs of no less **\$15M**.

b. Provide an estimate of the costs to DoD of obtaining MARS-type services by using other "in-house" active duty DoD personnel:

In developing the following cost estimates, the considerations used in Para a. above were used but with slight variations, and one additional consideration was added. These include:

1. That the existing pool of 9,000 volunteers currently involved in the MARS program no longer exists.
2. That the services to be provided by using other "in-house" active DoD personnel are to be the equivalent of what is provided by MARS today, i.e., seven days per week coverage, twenty four hours per day, on a worldwide basis.
3. That such services could be provided by no less than ten (10) "super stations" worldwide, each operating "full period" (twenty four hours per day, seven days per week).
4. That it requires no less than twelve (12) trained operators (not including supervisory logistics and administrative support) to operate a facility "full period" with three operators per shift.
5. That the average annual cost for a trained, skilled enlisted grade radio operator would be not less than \$25,000 (not including benefits such as quarters allowance, rations, leave, etc.).
6. That the average annual cost for a trained senior grade noncommissioned officer station supervisor/manager working five days a week, eight hours a day would be no less than \$35,000 (not including benefits such as quarters allowance, rations, leave, etc.).
7. That the average annual cost for an experienced company grade officer serving as station Officer-In-Charge would be no less than \$41,000 (not including benefits such as quarters allowance, rations, leave, etc.).

Considering these factors, the annual cost in salaries alone for just operating the stations needed with other in-house active duty DoD personnel to obtain "equivalent service" for seven days per week/twenty four hours per day coverage would be nearly **\$3.75M** dollars per year (\$25,000 annual salary x 12 operators per station x ten stations = \$3M + \$35,000 annual salary x 10 supervisors = \$.35M + \$41,000 x 10 Officers In Charge = \$.41M)

Added to this annually recurring base cost of **\$3.75M** would be the one time initial cost of reactivating and equipping each station, conservatively estimated to be **\$15M** (\$1.5M per station x 10 stations), as well as annual operating costs (other than salaries) such as rents, overseas pay differentials, benefits programs, maintenance of facilities, maintenance of equipment, supplies, transportation, and overhead costs, to name but a few, which could run as much as an additional **\$5M - \$8M annually**.

Therefore, the estimated annual cost to "obtain equivalent services" by using "in-house" active duty DoD personnel would conservatively be between **\$8.75M and \$11.75M**, which would, of course, be preceded by initial first year start up costs of no less **\$15M**.

c. Identify the cost savings to the Department through the use of MARS.

Alternative	Initial "set-up" costs	Projected annual recurring costs	Current total annual cost	Annual savings to DoD in using MARS
Commercial (Year 1)	\$15M	\$13.15M	\$700K	\$27.45M
Commercial (Year 2 and out)	\$0	\$13.15M	\$700K	\$12.45M
Active duty (Year 1)	\$15M	\$11.75M	\$700K	\$26.05M
Active duty (Year 2 and out)	\$0	\$11.75M	\$700K	\$11.05M

7. Identify the level of funding that will be required to institute each of the recommendations.

There will be no funding required to institute any of the recommendations we have made as all of them are considered to be "internal management changes".

First, it is our intention to establish a centralized administration and management structure to eliminate the three parallel stovepipe structures in place today.

Second, it is our intention to designate an Executive Agent within the DoD for administering the centralized MARS program.

Third, it is our intention to ensure that information on technical advancements is made available to all MARS members.

The result of these three actions will be a streamlined MARS program that can continue to operate well into the next century, providing the DoD with a valuable, cost-efficient form of emergency communications that will permit continued operations of critical functions when normal communications means are not available.