UNITED STATES AIR FORCE
MILITARY AFFILIATE RADIO SYSTEM

TRAINING MANUAL

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Contents

Section I

Voice Operations Training Guide

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Authorized by Headquarters AFCA
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Preface

To all MARS members:

You will find overprinted forms, blank forms, charts, and frequency lists as attachments to this document. These are included for your benefit and use throughout your MARS career.

I suggest that you make copies of all of the forms for your use and pass copies to other members who do not have them.

NOTE: Keep the original copies in a folder for later use in making more copies. Try to use originals as "master" for copies, since copies tend to get worse as they are copied.

LISTEN, LISTEN, LEARN IS GOOD ADVICE!

On many nets you will pick up useful information, but be careful that this information is correct. When in doubt, ask someone like your State MARS Director (SMD) or a region official. Remember, we are all here to assist you in any way we can.

"There is no such thing as a dumb question!" The only dumb question is one that is not asked.

FROM YOUR DIRECTOR AND TRAINING MANAGER

AIR FORCE MARS

To: **All new members, AFT#xx calls**

You have been accepted into an elite organization that is tasked with providing emergency communications support for the United States Air Force and all Government Agencies, which include the Federal Emergency Management Agency (FEMA), the Shared Resources (SHARES) HF radio program, and all other agencies of the Department of Defense and U.S. Government.

The opportunities offered by MARS for you to serve in public service support are limited only by your willingness to participate in the many programs that make this a unique organization.

Examples of some of the services offered by MARS follow:

1. Dispatch of health, morale and welfare traffic to and from military service personnel world-wide.

2. Disaster communications support for federal, state and civilian governmental agencies and other disaster relief organizations when requested.

3. Engineering and technical support in all systems to continue state-of-the-art readiness status.

4. Management training in local military base support positions.

Air Force MARS utilizes both voice and digital modes.

You will first be trained to use the correct radiotelephone procedures required for communications support of military and allied national forces. Additional training is available for those members that desire to use digital capabilities.

You will then be re-assigned to the traffic net system in one of several MARS programs.

This will be your primary assignment but you may participate in as many nets of the Air Force MARS program as you desire (excepting special assignment nets).

The expansion of your own horizons through your association with Air Force MARS and the members of this organization are limited only by your desire and capability.

Note: The minimum age to enter Air Force MARS is seventeen.

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CHAPTER 1

INTRODUCTION

1-1.1. General. The USAF Military Affiliate Radio System (MARS) was established in 1948 under the title "Military Amateur Radio System" and membership was restricted to active and reserve military personnel. In 1950 the doors were opened to civilian radio operators and the program title was changed to reflect civilian participation. Today, most of the over 5,000 Air Force member stations are civilian volunteers who, in many cases, have had little or no experience in military operating practices. One purpose of this guide is to provide the link between the amateur and the military radio operator.

1-1.1.1. This MARS Training Guide outlines the operational procedures that will be followed on all USAF MARS voice circuits.

1-1.1.2. Allied Communications Publications (ACPs) contain operating procedures that are used by all military radio operators. ACP-125 Voice Procedures are used throughout this training guide. The appropriate information for MARS use contained in that publication has been extracted and is incorporated in this guide.

1-1.1.3. Conflicts in the procedures contained in this guide and those in an ACP or other Air Force publications may be identified in writing to the Region MARS Director for possible resolution.

1-1.1.4. Proposed changes to this guide should be submitted, in writing, to the Region MARS Director for consideration. There will be no deviations from established procedure without approval from the RMD.

1-1.2. MARS Training Program. Every new member will be assigned to a state or sometimes region) level training net. The region or state trainer will supply all new trainees with a training guide. All training will be conducted by state trainers following the procedures contained in this guide. Upon satisfactory completion of the training (as adjudicated by the Region Training Manager), each member will be given a primary assignment to a net or activity according to the needs of the MARS program. Six hours participation in the primary assignment will be required for each member and another six (for the required 12 hours per quarter) can be earned in any authorized open net. Completion of Training Certificates will be issued by the Region Training Manager to all trainees that satisfactorily complete their training.

1-1.2.1. Present members may request to be assigned to a training net for refresher purposes. These members will not be required to maintain their primary assignment responsibilities, but will receive primary time credit for their training on quarterly participation reports.

1-1.2.2. All trainees assigned to formal state or region training net must make every effort to participate in scheduled training sessions. Training must be completed within 60 days after initial assignment (excepting extenuating circumstances). It is the trainee's responsibility to

notify the Region Training Manager of any circumstances that will prevent participation. Failure to complete training within 60 days after initial assignment is cause for termination from the MARS program.

1-1.2.3.   The material covered in this guide is subject to testing to determine operating proficiency. A satisfactory grade demonstration of on-air proficiency is a prerequisite to the award of the USAF MARS Training Course Completion Certificate. The trainer will evaluate proper operating techniques and message handling during net or classroom sessions.

1-1.2.3.1. Local classroom training may be conducted in lieu of the on-the-air training if suitable frequencies are not available or usable. The proficiency demonstration will be under simulated on-air conditions. This type of training will always be under the control of a trainer who is appointed by the appropriate MARS official. The instructor will arrange for classroom space when, where and if possible.

1-1.2.4.   Responsibilities:

1-1.2.4.1. Region Training Manager (RTM):

1-1.2.4.1.1.   Coordinate with the State MARS Director and appropriate state trainers in establishing required training nets.

1-1.2.4.1.2.   Assist state trainers and conduct state trainer nets if necessary. Coordinate with appropriate State MARS Director.

1-1.2.4.1.3.   Provide standardized training materials and training net rosters to instructors.

1-1.2.4.1.4.   Maintain attendance records of trainees. Forward names of students who fail to meet proficiency requirements to the appropriate SMD.

1-1.2.4.1.5.   Monitor training net activities and provide assistance as required.

1-1.2.4.1.6.   Conduct end-of-course examinations of trainee within three days after certification of proficiency has been received from the training instructor. Grade each trainee and forward results to the trainer and SMD.

1-1.2.4.2. State MARS Director (SMD):

1-1.2.4.2.1.   Coordinate with the Region Training Manager to identify training requirements.

1-1.2.4.2.2.   Assign MARS Trainees (on AF Form 3661) to a training net or class within seven days after receipt of approved Military Affiliate Radio System membership application.

1-1.2.4.2.3.   Maintain a list of state MARS Trainees enrolled in training.

1-1.2.4.2.4.   Assign member graduates to the operational (voice or digital) networks after completion of course.

1-1.2.4.2.5.   Initiate cancellation for any trainee who fails to comply with the provisions outlined in this manual. HQ AFCA/ECFP <u>or designated authority,</u> will sign and authenticate all such cancellations.

1-1.2.4.3. State Trainer or Manager:

1-1.2.4.3.1.   Send each trainee a copy of the training guide before the first net or classroom meeting.

1-1.2.4.3.2.   Prepare and conduct training nets or classes in accordance with the operating procedures contained in this guide.

1-1.2.4.3.3.   Assist the Trainee in becoming a fully qualified MARS member and arrange for on-the-air proficiency training.

1-1.2.4.3.4.   Coordinate with the Region Training Manager on training net practices. Procedural disparities will be identified, in writing, to the Region MARS Director for evaluation.

1-1.2.4.3.5.   Forward certification of Trainee proficiency within 7 days after completion to the Region Training Manager.

1-1.2.4.3.6.   State Trainer or classroom training instructors will send attendance data to the Region Training Manager. State trainers will certify Trainee net attendance by message or letter to the Region Training Manager. This information should be sent within 24 hours after the end of the session.

1-1.2.4.4. MARS Trainee:

1-1.2.4.4.1.   Review and be familiar with each training lesson before the scheduled training session. Advise the trainer if training manual is not received before the first net meeting.

1-1.2.4.4.2.   Comply with any special preparation instructions outlined in each session. Questions will be addressed to the SMD or state trainer, during the training session.

1-1.2.4.4.3.   Coordinate with the state trainer when scheduling conflicts occur. Arrangements will be made on an individual basis between the Trainee and state trainer.

1-1.2.4.4.4.   Complete the final on-the-air test messages by the Region Training Manager or his/her designated assistants.

1-1.3. MARS Personnel Action Notification:

1-1.3.1.   The AF Form 3661 is an Air Force Form that initiates action in accordance with AFI 33-106.   AF Form 3661 is used to notify a member of initial assignment, official appointment, transfer, termination of MARS membership, or other actions. AF Form 3661 will be distributed in accordance with current **M**ARS **O**perating **I**nstructions or policy broadcasts received from HQ AFCA or their designated authority. Specifically, AF Form 3661 actions include:

1-1.3.1.1. MARS membership application approvals.
1-1.3.1.2. Primary and secondary assignments.
1-1.3.1.3. Region and state appointments.
1-1.3.1.4. Net, frequency, net times and emission specifics.
1-1.3.1.5. Net Manager name and address.
1-1.3.1.6. Inactive status.
1-1.3.1.7. Termination action as indicated below:

1-1.3.1.7.1.   Expiration of License.
1-1.3.1.7.2.   Failure to meet minimum participation requirements.
1-1.3.1.7.3.   Failure to report change of address or other information on file.
1-1.3.1.7.4.   Failure to reply to official correspondence.
1-1.3.1.7.5.   Resignation.
1-1.3.1.7.6.   Death.

1-1.3.2.   Terminated members are required to return AF MARS license and ID to their respective SMD. They are also responsible for returning or transferring all equipment that was requisitioned through the MARS program.

1-1.3.3.   All terminations for cause are authenticated and signed by Headquarters AFCA or their designated authority.

1-1.3.4.   AF Forms 3661 are ***NOT*** used to upgrade or renew MARS licenses, notify change of address, transfers, or any other action that is not specifically indicated for this form. The form used for information not suitable for the AF Form 3661 is designated as the MARS Application Form and must be used accordingly.

1-1.3.5.   All personnel action forms will be distributed to all officials concerned with the action indicated.

1-1.3.5.1. The prescribed originating official ***MUST*** sign all AF Froms 3661.

1-1.4. Voice Procedures: MARS voice procedures require the use of the standard International Phonetic Alphabet, number enunciation, and standard prowords as follows:

Phonetic Alphabet

A...Alpha .... AL-fa

B...Bravo .... BRA-vo

C...Charlie .... CHAR-ly

D...Delta .... DELL-ta

E...Echo .... EK-oh

F...Foxtrot .... FOCKS-trot

G ....Golf .... Golf

H...Hotel .... HO-tell

I ....India... IN-dee-a

J ....Juliet .... JEW-lee-et

K...Kilo.. KEE-lo

L...Lima... LEE-ma

M ....Mike .... Mike

N...November .... No-VEM-ber

O ....Oscar .... OS-car

P...Papa .... pa-PAH

Q ....Quebec.. KAY-beck

R...Romeo .... RO-mee-oh

S...Sierra .... SEE-air-ah

T...Tango .... TANG-oh

U...Uniform .... YEW-nee-form

V...Victor .... VIC-tor

W..Whiskey .... WISS-key

X...Xray .... EX-ray

Y...Yankee .... YANG-kee

Z...Zulu... ZOO-loo

Capitalized portion of pronunciation is to be emphasized. Be natural; don't force the pronunciation.

NUMBER PHONETICS

1	One	WUN
2	Two	TOO
3	Three	TREE
4	Four	FOWER
5	Five	FIFE
6	Six	SICKS
7	Seven	SEVEN
8	Eight	ATE
9	Nine	NINER
0	Zero	ZEE-roh
100	One hundred	Wun- zero-zero
1000	One thousand	Wun-zero-zero-zero
(.)	Decimal point	Day-see-mal

Note: MARS number phonetics contain no phrases such as "one thousand", "one hundred thousand" etc. ALL numbers are given figure by figure phonetically.

AUTHORIZED PROWORDS

PROWORD	EXPLANATION
ADDRESS GROUP	The group that follows is an address.
ALL AFTER	The portion of the message that I have referenced is all that follows as indicated. (Usually followed by the proword SAY AGAIN).
ALL BEFORE	The portion of the message that I have referenced is all that that proceeds as indicated. (Usually followed by the proword SAY AGAIN).
BREAK	Indicates separation of text from other portions of the message.
CALL SIGN	The group that follows is a call sign
CORRECT	You are correct or what you have transmitted is correct.
CORRECTION	An error has been made in my (your) transmission. Correct transmission follows.
DISREGARD THIS	Disregard this transmission. This proword should never be used to cancel a receipted message
FIGURES	The group (or groups) that follows is composed of numbers. NOTE: The group can also contain letters, but will use the proword FIGURES when the first character is a number.
FROM	Address or MARS callsign/w state of the originating station.
GROUPS	Followed by the number of groups in a message. This can be optional.
GROUPS NO COUNT	The groups in this message have not been counted.
INFO	The addresses immediately following are given for information.
INITIAL(s)	The group or groups that follow is composed of letters. NOTE: The group can also contain figures, but will use the proword INITIAL(s) when the first character is a letter.
I READ BACK	Read back text at reading speed.
I SAY AGAIN	Repeat previous transmission (or portion) as indicated.
I VERIFY	That which follows is verified at your request and is repeated.
IMMEDIATE	Precedence of message. (This is the highest used in MARS).

MORE TO FOLLOW ....Additional message traffic will follow.

NUMBER ....Station sequential message number. (Begin new numbering sequence each month.) This is the only item that changes on any message.

OUT ....End of transmission. No answer is required or expected. **NEVER** used with the proword OVER.

OVER...................................End of transmission.   Reply is expected and required. **NEVER** used with the proword OUT.

PRIORITY ....Precedence of message. (This is second highest used in MARS).

READ BACK........................Request for a read back text of message (or entire message) at reading speed.

RELAY ....Retransmit this message to addressees or callsign that follows.

ROGER................................Message understood.

ROUTINE.............................Precedence of message. (This is the lowest used in MARS).

SAY AGAIN.........................Repeat all or portions of transmission as indicated.

SERVICE..............................Message redirected to originating stations for action as indicated.

SILENCE..............................All stations cease transmissions immediately. This condition will remain in effect until lifted.

SILENCE LIFTED ....Normal net conditions reinstated.

SPEAK SLOWER ....Slow copy speed.

THIS IS ....Followed by callsign of station transmitting.

TIME....................................Followed by date-time group.

TO ....Followed by address to which message is being sent.

UNKNOWN STATION ....Unknown station with which communication is desired.

VERIFY ....Verify entire message (or portion indicated) with the originator and send verified version.

WAIT ....Pause for a few seconds. No return call to the net is necessary

WAIT OUT............................Pause for longer than a few seconds and call upon return to the net.
NOTE: Periods longer than five minutes **_MUST_** authorized by the
net control station.

WILCO ....Your signal received, it understand and I will comply. Since the
meaning of "ROGER" is included in that of WILCO, the two
prowords are **_NEVER_** used together.

WORD AFTER......................The word of the message to which I have reference is that which
follows.

WORD BEFORE...................The word of the message to which I have reference is that which
proceeds.

WORD TWICE......................Transmit each word twice and spell phonetically if necessary.
Often used during difficult periods of communications due to
weather or EME interference.

1-1.5. Calling/Responding On MARS Traffic Nets: *Whenever the pause (PAUSE) is indicated in the following examples, unkey the microphone and listen for three or four seconds to ascertain if another station is transmitting. This procedure is used to reduce the chance of two or more stations transmitting at the same time.*

   1-1.5.1.   How to check in without traffic:

       1-1.5.1.1. At net call or after state call.

       1-1.5.1.2. THIS IS (pause) AFA#FB (phonetics), ATLANTA, GEORGIA OVER.

       1-1.5.1.3. During state-by-state roll call.

       1-1.5.1.4. THIS IS (pause) AFA#FB (phonetics), ATLANTA, OVER

> **NOTE: It is not necessary to give the state when the NCS is calling for check-ins by state. Use paragraph 1-5.1.2 when checking in <u>after</u> the state-by-state roll call is completed. Use paragraph 1-5.1.4 when checking in on the state-by-state roll call. <u>It is NOT necessary to say that you have no traffic. That is understood.</u>**

   1-1.5.2.   How to check in with traffic (all examples shown are after the state roll call has been completed):

       1-1.5.2.1. THIS IS (pause) AFB#CK (phonetics), WINCHESTER, TENNESSEE, ONE ROUTINE MONTGOMERY, ALABAMA, TRANSCON AGENT OVER.

       1-1.5.2.2. THIS IS (pause) AFF#T (phonetics), ATLANTA GEORGIA, ONE ADMINISTRATIVE DISCUSSION WITH AFA#PM (phonetics), OVER

       1-1.5.2.3. THIS IS (pause) AFA#MM (phonetics), ATLANTA, GEORGIA, ONE INFORMAL WITH AFF#T (phonetics), OVER.

       1-1.5.2.4. THIS IS (Pause) AFA#UM (phonetics), CLEVELAND, TENNESSEE ONE ROUTINE TRANSCON, ONE ROUTINE MIAMI FLORIDA, LIAISON NET 2TNF1, BEACON STATION, REQUEST TO CLOSE AT 0100 ZULU, OVER

> **NOTE:** *The response of* **"NO TRAFFIC"** *is not used when checking into AF MARS NETS.* **An informal or administrative MARS discussion is traffic. For example, to say, "THIS IS (PAUSE) AFF#TN (phonetics), CLEVELAND TENNESSEE, NO TRAFFIC, ONE INFORMAL WITH, AFA#JK (phonetics), OVER"** *is not correct*. <u>An informal discussion is traffic, therefore, the expression "NO TRAFFIC" should not be used!</u>

   1-1.5.3.   How to request to close (when already checked into the net):

       THIS IS (pause) AFA#WD (phonetics), REQUEST TO CLOSE, OVER

   1-1.5.4.   How to request a temporary close:

           THIS IS (pause) AFA#WD (phonetics), REQUEST TO CLOSE FOR FIGURES
           WUN ZERO MINUTES, OVER

> **NOTE: If the closure is to be longer than 15 minutes, close and then reenter the net later on. Check in as outlined in paragraph 1-5.1.2 or 1-5.1.4 above. When requesting a specific closing time, it is not necessary to call the NCS when that time arrives and request to close again. If you remain past the requested closing time, advise the Net Control Station (NCS) so that you will get credit for the time actually on the net.**

1-1.5.5.   How to return to net after a temporary close:

   THIS IS (pause) AFA#WD (phonetics), BACK ON FREQUENCY, OVER.

1-1.5.6.   How to request a radio check:

   AFA#LA (phonetics) THIS IS AFB#CK (phonetics), RADIO CHECK OVER.

1-1.5.7.   How to respond to a radio check (some examples):

   THIS IS AFA#GV (phonetics) LOUD AND CLEAR, OVER

   THIS IS AFA#GV (phonetics) GOOD READABLE, OVER

   THIS IS AFA#GV (phonetics) WEAK READABLE, OVER

   THIS IS AFA#GV (phonetics) WEAK READABLE, OVER

   THIS IS AFA#GV (phonetics) WEAK READABLE WITH HEAVY STATIC, OVER

   THIS IS AFA#GV (phonetics) WEAK UNREADABLE, OVER

   How a station is instructed to send traffic by the NCS:

   AFA#TS (phonetics) THIS IS AFF#T, SEND ONE ROUTINE WINCHESTER, TENNESSEE, ONE ROUTINE MANCHESTER, TENNESSEE TO AFB#CK (phonetics), OUT.

1-1.5.8.   How-to respond when traffic is directed to your station:

   1-1.5.8.1. As the receiving station, do not transmit until the sending station invites you to do so. In the following example, AFA#TS is the transmitting station (sending the traffic) and AFB#CK is the receiving station.

   AFA#TS transmits: AFB#CK (phonetics), THIS IS AFA#TS (phonetics), RADIO CHECK, OVER.

   AFB#CK transmits: THIS IS AFB#CK LOUD AND CLEAR (or whatever conditions are), OVER. (The above procedure establishes that conditions are good traffic quality)

   AFA#TS transmits: ROGER, MESSAGE NUMBER ###   etc. (AFA#TS starts sending the message).

1-1.5.9.   How to receipt for a message. (Some examples):

THIS IS AFA#VJ (phonetics) ROGER NUMBER ONE FIVE OUT

THIS IS AFA#VJ (phonetics) ROGER NUMBER ONE FIVE OVER

> Note the "OVER" in above line indicates that there are more messages to follow
> and that the receiving station is ready to copy the next message.

1-1.5.10.   How to respond to a call to your station:

THIS IS AFB#CK OVER *(Do not pause after "THIS IS" when your station is called)*

1-1.5.11.   How to obtain a "FILL" or have information repeated. (Some examples):

1-1.5.11.1. (REQUEST): THIS IS (YOUR CALLSIGN) SAY AGAIN, OVER. (meaning
- repeat the last transmission)

(RESPONSE): THIS IS (YOUR CALLSIGN) I SAY AGAIN.(repeat
transmission), OVER.

1-1.5.11.2. (REQUEST): THIS IS (YOUR CALLSIGN) SAY AGAIN, "FROM" LINE
OVER

(RESPONSE): THIS IS (YOUR CALLSIGN) I SAYAGAIN,'FROM" LINE
(repeat from line),.OVER.

1-1.5.11.3. (REQUEST): THIS IS (YOUR CALLSIGN) SAY AGAIN ALL AFTER
_____ AND ALL BEFORE _____ OVER

(RESPONSE): THIS IS (YOUR CALLSIGN) I SAY AGAIN ALL AFTER
_____ AND ALL BEFORE _____OVER

1-1.5.11.4. (REQUEST): THIS IS (YOUR CALLSIGN) SAY AGAIN, WORD AFTER
_____ OVER.

(RESPONSE): THIS IS (YOUR CALLSIGN) I SAY AGAIN WORD AFTER
_____ (pronounce the word, spell it phonetically, pronounce it again), OVER.

1-1.5.11.5. (REQUEST): THIS IS (YOUR CALLSIGN) SAY AGAIN, GROUP COUNT
OVER.

(RESPONSE): THIS IS (YOUR CALLSIGN) I SAY AGAIN, GROUP zero
seven OVER.

1-1.5.11.6. (REQUEST): THIS IS (YOUR CALLSIGN) SAY AGAIN THE TEXT AT
READING SPEED, OVER.

(RESPONSE): THIS IS (YOUR CALLSIGN) I SAY AGAIN TEXT AT
READING SPEED (Repeat text at reading speed), OVER

1-1.5.11.7. (REQUEST): THIS IS (YOUR CALLSIGN) SAY AGAIN PHONE
FIGURES IN "FROM" LINE OVER.

(RESPONSE): THIS IS (YOUR CALLSIGN) I SAY AGAIN PHONE
FIGURES IN "FROM" LINE, PHONE FIGURES _____OVER.

1-1.5.12.   How to let the transmitting station know when to continue after all fills have been requested:

ROGER, OVER

> **NOTE: Responding with THIS IS (YOUR CALLSIGN) ROGER, OVER when all fills have been resolved or when no fills are required is the preferred response.** *Remaining silent if no fills are required is a proper response, but for more efficient net operation, responding immediately with ROGER, OVER is the recommended procedure.*

1-1.5.13.   How To Relay:

THIS IS (PAUSE) AFA#WJ (phonetics), MAY I RELAY OVER

The NCS will respond: AFA#WJ THIS IS AFF#T. PLEASE RELAY OVER.

> **NOTE: The relaying station, the relaying station will relay information exactly as it was heard. The NCS will ask for further information if needed. When the relaying station needs further clarification may request permission form the NCS to call the station in question. RELAYS ARE ONLY GIVEN AT THE DIRECTION OF THE NET CONTROL STATION.**

1-1.5.14.   Dual Transmissions: Listen for a few seconds before transmitting. Let the NCS respond. Do not add to the confusion by transmitting prematurely. The NCS will usually address the net again, which is an invitation to the dualing station(s) to transmit again, using the "THIS IS" (pause) sequence.

1-1.5.15.   How to respond when the FYMON or NCS asks for or gives your station a tuning count:

THIS IS AFA#UH ONE, TWO, THREE, FOUR, FIVE, FIVE, FOUR THREE,
TWO, ONE, OVER.

CHAPTER 2

OPERATIONS

1-2.1. Radio Operator Circuit Discipline.

1-2.1.1.   Only authorized transmissions will be made.

1-2.1.1.   Specifically forbidden practices are:

1-2.1.2.   Violation of radio silence.
    1-2.1.2.1. Unauthorized conversation between operators.
    1-2.1.2.2. Transmissions in a directed net without permission.
    1-2.1.2.3. Excessive tuning and testing.
    1-2.1.2.4. Use of other than authorized prosigns and prowords.
    1-2.1.2.5. Use of operators names (addressing them) during a directed net.
    1-2.1.2.6. Transmissions on unauthorized frequencies and beyond authorized tolerances.
    1-2.1.2.7. Profane, indecent, or obscene language.
    1-2.1.2.8. Use of VOX or RIT clarifier.
    1-2.1.2.9. Transmission of political or pecuniary traffic.

1-2.2. Type Of Nets.

1-2.2.1.   ***All nets in Air Force MARS are directed nets***.

1-2.2.2.   Informal communications are strictly limited to no more than 5 minutes.

1-2.2.3.   Administrative discussions may exceed the five minute limit but MUST be confined to AF MARS business and include one or two officials.

1-2.3. Drafting messages.   When a message that shouldn't be transmitted via MARS *is accepted in error* and transmitted via MARS, it is the fault of the originating station. The originating station operator; therefore, is the person who must employ guidelines relative to acceptance of messages. The text of the message should be brief, clear and accurate. The text is normally restricted to 50 groups or words. Initial death notices will be sent ONLY through the American Red Cross or a local clergyman and not through MARS channels.   All such unauthorized messages must be pulled from the system and forwarded to the Region MARS Director <u>or their designated authority</u>.

1-2.4.   American Radio Relay League (ARRL) Numbered Text Message. ARRL numbered text messages will be used to reduce the length of message texts when possible. These messages will be fully written out showing the actual meaning, before the message is delivered to the addressee. The prefix ARL, followed by a number, denotes an ARRL numbered text message. Identifying numbers denoting ARRL texts described in USAF MOD will be transmitted as words (spelled out) rather than figures. For example, "ARL fifteen" or "ARL thirty one", are sent as:

      ALFA ROMEO LIMA FIFTEEN, I SPELL FOXTROT INDIA FOXTROT
      TANGO ECHO ECHO NOVEMBER - FIFTEEN; OR ALFA ROMEO LIMA

THIRTY, I SPELL TANGO HOTEL INDIA ROMEO TANGO YANKEE –
THIRTY, ONE, I SPELL OSCAR NOVEMBER ECHO - ONE.

1-2.5.   Phonetic Alphabet.   When it is necessary to identify any letter of the alphabet the International Telecommunications Union (UTC) phonetic alphabet will be used.   Phonetics should not be used when the actual word might be more readily understood.   An example: FIGURES "two six degrees West" might be better than FIGURES "two six delta echo golf romeo echo echo sierra INITIALS whisky echo sierra tango."

1-2.6.   Operating Signals.   Operating signals (Q and Z) are not ordinarily used in the MARS circuits.   They may be used in some digital modes when necessary for brevity and clarification.

1-2.7.   Punctuation Abbreviations.   Punctuation abbreviations must not be confused with operating signals.   In order to assure accuracy, written punctuation will be used where it is deemed necessary.   When used, the punctuation will be included in the group count and always be pronounced phonetically.

COMMON PUNCTUATIONS:

PUNCTUATION	WRITTEN AS	SYMBOL	PHONETICS
PERIOD	PD	.	pa-PAH delta
COMMA	COM	,	Charlie Oscar Mike
COLON	CLN	:	Charlie Lima November
OPEN PARENTHESES	PAREN	(	**pa-PAH Alpha Romeo Echo November**
CLOSE PARENTHESES	UNPAREN	)	**Uniform November pa PAH Alpha Romeo Echo November**
QUOTATION MARKS	QUOTE	"	**Quebec Uniform Oscar Tango November**
END OF QUOTATION	UNQUOTE	"	**Uniform November Quebec Uniform Oscar Tango Echo**
HYPHEN	DASH	-	Delta Alpha Sierra Hotel
STROKE / SLANT BAR	SLANT	/	**Sierra Lima Alpha November Tango**
QUESTION MARK	QUERY	?	**Quebec Uniform Echo Romeo Yankee**

1-2.8.   Station Identification.   The proper identification of stations is extremely important and is required not only by military procedures but by national and international regulations as well. The following procedures will always apply when identifying Air Force MARS stations:

1-2.8.1.   Complete call sign will be used and never abbreviated.   They will be used at the beginning of ALL transmissions. Phonetics will be used initially and spoken letters and figures thereafter.   It is NOT necessary to use phonetics every time your callsign is given.   When a new communication begins with the same or another station, phonetic callsigns will be given during the initial transmission **_ONLY_** as indicated above.

1-2.9.   Station Configuration Modification.   It is the affiliate member's responsibility to notify the RMD through the SMD of any changes in station configuration (FCC amateur license changes, address changes etc,) In all instances outlined below submit two copies to the SMD as soon as possible.

    1-2.9.1.   If the change involves an address change notify your SMD. When you receive your updated amateur license send two copies to the SMD.

    1-2.9.2.   Any changes to your amateur license, send two copies to the SMD when you receive the updated, changed license from the FCC.

1-2.10.   Mail Address Element.   When using AFMARS provided postage stamps the return address will be your own address with "Official Business" typed below as shown in 2.10.1. Address for correspondence to Chief MARS, <u>or designated authority</u>, is shown in paragraph 2.10.2:

    1-2.10.1.   Joe I. America, AFA3AA
                123 Elm St
                Tonka, KS 66010-9877
                   Official Business

    1-2.10.2.   HQ AFCA/ECFP (MARS)   (Or designated Headquarters of AF MARS)
                203 W LOSEY STREET
                ROOM 3100
                SCOTT AFB, IL 62225-5222

1-2.11.   Telephone procedures.   Do not service message because the telephone number is incorrect or not given as part of the addressee's information. Make an effort to find the number.

    1-2.11.1.   Use your telephone directory. Sometimes looking for the street address will help you find the number.

    1-2.11.2.   Use Directory Assistance. Please note that some telephone companies charge for this service.   The number of free directory assistance calls depends on your local telephone company.

    1-2.11.3.   If the telephone number is unlisted or not in the directory, mail the message using official mail media (only <u>if</u> the message originated at an overseas location.) Messages that cannot be delivered will be serviced back when all alternate methods have been exhausted. Messages that cannot be phoned (outside of local calling area) or mailed (originated in CONUS) should be sent to VHF, PACKET, or other MARS circuits.

    1-2.11.4.   Try the use of Amateur or *other means* before considering servicing the message back to the originating station. "Official" traffic may be mailed if necessary.

1-2.12.   TRANSCON Check-In.   After training requirements have been met it is permissible to check-in on TRANSCON traffic nets.   Only technician class or higher license holders are

granted this privilege. Stations going to TRANSCON should have regional day and night frequency capability and/or be able to pass the traffic for relay to a local MARS member with regional frequency capability. Frequencies can be obtained from your SMD or RMD. See TRANSCON procedures section in this manual.

1-2.13. Use Of Frequency Designators. Listings of frequencies and their designators can be obtained from your SMD, Training Manager or RMD. Frequency designators should <u>always</u> be used. Actual frequencies are ***<u>NEVER</u>*** transmitted on the air. (Exceptions being air-to-ground Phone Patch transmissions to the pilot concerned).

1-2.14. Station Logs. Station logs are available through the AF MARS program – contact your SMD. However, each affiliate MARS operator may use the amateur log form he/she presently in use in his/her station. Most operators prefer the amateur log form. It is suggested that MARS operations be recorded on a separate log form. These forms must be retained for one year.

1-2.15. Off-Frequency Operation. USAF MARS operating procedures require very accurate frequency operation. If the NCS or FYMON calls your station informing you of off-frequency operation, a count will be given for tuning purposes. Respond with: '<u>THIS IS (your call sign) ONE TWO THREE FOUR FIVE, FIVE FOUR THREE TWO ONE, OVER."</u> <u>Comments such as "How now, etc." are incorrect and are *not* authorized.</u> The counting procedure outlined above gives the NCS or FYMON an adequate amount of your transmission to listen to and check to determine if you are within the established frequency tolerance. Allowed tolerance is now plus or minus 20 Hz.

1-2.16. Group Counts.

   1-2.16.1. <u>Establishing A Group Count (Optional)</u>: Assigning an accurate group count can not be over-emphasized. It is one of the primary means to determine if the message has been correctly received.

      1-2.16.1.1. Count text groups only between each break in the message.

      1-2.16.1.2. Punctuation prowords (comma, colon, period, etc. and abbreviations (COMM, CLN, PD, etc.) are counted as groups.

      1-2.16.1.3. A sequence of characters not interrupted by a space is counted as one group. Example pronounced without phonetics as: "scr-211" and spoken phonetically as: 'initials sierra, charlie, romeo, hyphen, two, one, one' and pronounced again as "scr-211" without phonetics.

      1-2.16.1.4. The group count is written and transmitted in conjunction with the proword "GROUPS" when used.

      1-2.16.1.5. The group count that is established by the transmitting (originating) station is final. When the group count does not agree, the receiving station should verify the group count and the message by requesting the sender to letter the text. This operation requires the sending station to read phonetically the first letter or figure of each group in the text. If the group count cannot be resolved, an operator's note should be attached to the message noting the difference in the group count.

1-2.16.2.   Questioning the group count: See paragraph 2-16.a.(5) above. If the number of groups copied does not agree with that of the originator, the operator must question and resolve it **_before_** receipting for the message. For GROUPS SERVICE, see page 22 describing service messages.

1-2.17.   USAF MARS Broadcast. The USAF MARS broadcast originates periodically at HQ Scott AFB (MARS), or their designated authority, and is directed to all Military and Affiliate MARS members. The broadcast provides general information, instructions and new policy to all member stations, which is official until expiration date or superseded by another broadcast or official declaration. The broadcast will also be read on all 2S1 voice nets and on digital nets. SMDs and net managers are responsible for having the broadcast read on state HF and VHF administrative nets. They may set policy and should be kept on file for future reference.

NOTE: ECOM broadcasts and RMD Bulletins will also be issued as necessary.

1-2.18.   Digital Nets. Daily nets on both AMTOR FEC mode and MFSK mode are held at 1000 and 1900 ES(D)T on net TRR as propagation dictates. The net (TRR) begins on MFSK for the first hour (plus or minus) and then switches to AMTOR FEC, MT-63, PACTOR II and RTTY if necessary for the second hour. Stations check in from other Regions in the CONUS. These nets are classified as TRANSCON and are open to all MARS services. Frequencies used are TDB for mornings and TDC for evenings. The TDA frequency is used as an alternate. All nets are attended nets and are all called the TRR net (Transcontinental Radio Relay). The attending NCS will respond to any digital mode operated on the frequencies indicated. If any member does not have the MFSK (or whatever is being used at the time), the NCS may respond to voice USB to resolve any problems. Members interested in digital BBS operation should contact AFF#K. Changes in these schedules, frequencies and modes will be announced when and if necessary and may occur at any time. See detailed procedures in digital operations which are discussed later in another section of this manual.

1-2.19.   Transmission Of Numbers And Spelling

1-2.19.1.   **Transmission of Numerals.** The proword "FIGURE(s)" must precede numerals except in a few special cases (such as the date time group and in the group count). Numbers are transmitted digit by digit. For example: "127" is transmitted as "FIGURES ONE TWO SEVEN'. In the case of mixed groups of figures and letters, the proword appropriate for the first character of the group will be used. For example: 6U8 is transmitted as 'FIGURES SIX UNIFORM EIGHT", whereas "A35' would be transmitted as "INITIALS ALPHA THREE FIVE."

> NOTE: The use of words "ZIP" or "ZIP CODE" has been deemed unnecessary in message address transmission. In transmitting the address, only the proword "FIGURES" need precede the ZIP code. Do not say "ZIP FIGURES" or "ZIP CODE FIGURES.

> NOTE: When giving the DTG always precede the group with the PROWORD "TIME." The proword 'FIGURES' is never used before the DTG. All figures are said phonetically. The month is NOT said phonetically. The year figures are said phonetically and given in four digits."

1-2.19.2.   Spelling. Three steps are used for spelling words:

1-2.19.2.1.   Pronounce the word.

1-2.19.2.2.   Say "I spell" then spell the word phonetically.

1-2.19.2.3.   Pronounce the word again.

1-2.19.3.   Say the word: "SMITH" then: "I SPELL SIERRA MIKE INDIA TANGO HOTEL" then say: "SMITH" again.

1-2.19.4.   Always spell names, addresses, and any unusual words. Try to anticipate problem words, and words which can be easily confused with others. When spelling a word, remember to give the receiving station time to catch up to that part of your traffic. It won't help very much if you are spelling a word at the end of a sentence while the receiving station is writing the first part of the sentence.

1-2.19.5.   Occasionally spell a simple word out to allow the receiving station time to catch up, in case the receiving station is copying behind.

CHAPTER 3

THE MESSAGE

1-3.1. Plain Dress Message. The basic Health and Welfare message used in the MARS circuits is designated as the "plain dress" message.

    1-3.1.1.   **Message Structure.** This message is composed of six major sections. These sections are listed below with some explanation.

        1-3.1.1.1.   Message number and PRECEDANCE. The message number is the number assigned to the message by the originator of the message. The message number is the ONLY item that changes as the message is relayed through the system. Stations relaying the message will assign his/her message number to the message. The PRECEDANCE will never change.

        1-3.1.1.2.   Date Time Group. This section is composed of the day, time (in ZULU), the month and the year. The Date Time Group (DTG) is always preceded by the proword "TIME" followed by the day figures (phonetically), the time figures (phonetically), the month (spoken as the month and NOT phonetically) followed by the year (phonetically) <u>using all four figures of the year</u>. The proword "FIGURES" is NEVER used before the DTG. The DTG <u>NEVER</u> changes throughout the path of the message.

        1-3.1.1.3.   The "FROM" line. This section contains the complete name and address of the message originator. The phone figures should be included if available. If the originator and recipient are MARS members, the "FROM" line may be shortened by using only the name, call sign and state.

        1-3.1.1.4.   The "TO" line. This section contains the name, address and phone number (if available) of the intended message recipient. It should be as complete as possible.

        1-3.1.1.5.   The "GROUP COUNT". This section lists the total number of words (groups) in the message. The "GROUP COUNT" is now optional but, when used, serves to insure the accuracy of the message. A discussion of the composition of a group is discussed elsewhere in this manual.

        1-3.1.1.6.   The "TEXT" of the message. The text is composed of the information intended to be conveyed to the recipient.

    1-3.1.2.   Operator Notes. When there is some confusing area of the text or heading, it should be included AFTER the message as operator comments. It is not considered part of the formal message but serves to avoid any errors by the relaying stations and recipient. Operator's notes should never be sent to the final recipient.

    1-3.1.3.   Delivery. Messages may be mailed or phoned to the final recipient.

    1-3.1.4.   Message Forms. Mailed messages should always be sent on the form AF-427. The overprinted Form 427 should NEVER be used for sending the final message. Use only the blank form. Always type the message sent to the recipient.

1-3.1.5.   Reply Message.   MARS operators should always solicit answers to messages (unless they involve transient service personnel).

1-3.1.6.   Sample Message. A sample of the PLAIN DRESS message is shown below:

AFA#xx this is: AFA#yy

Number 47 ROUTINE (or whatever precedence)

TIME: 101820ZOctober2005

FROM: John Doe
      123 Park Street
      Mountain Park,WV   25508-4762
      Phone: 304-765-4321

TO: Mary Doe
      987 Apple Hill Dr.
      Winchester, TN 37398-9651
      Phone: 931-123-4567

GP: 12

BT

ALL IS WELL HERE. I WILL WRITE SOON OR CALL.

LOVE JOHN

BT

Operator's notes should include any questionable groups or confusing statements that could not be resolved by the relaying station. The appropriate response after the initial break following the Group Count should be "ROGER OVER". The appropriate response following the last break should be "ROGER" your number four seven, "OUT". If more messages are to follow, the response should be "ROGER your number four seven, "OVER". Each relaying station should assign his/her message number to each message relayed. These numbers should commence at the beginning of each month and end at the end of each month. All relayed messages should be kept on file for one year.

1-3.2. Service Messages.   The most common reason for a service message is when a MARSgram cannot be delivered. MARS does not guarantee delivery of any message. When a MARSgram cannot be delivered, the receiving station must so advise the station that originated the message.

1-3.2.1.   Required Elements For A Service Message are:

- ➢   Precedence   *Same* as the original message being serviced.

- ➢   Date-Time-Group   <u>Always the same</u> and stays with the message until delivered.

- ➢   From   (Your complete name, street address, city, state, the phonetically said punctuation slant bar, your MARS call sign and state). If the message is from another MARS member, going to another MARS member, only the callsign and state need be given.

- ➢   To   (Give complete name and address and phone number if available). If the message is from another MARS member, going to another MARS member, only the callsign and state need be given. Always send this type message to the originator.

- ➢   Groups   The preferred method is to identify the message as a service message by inserting the proword "SERVICE" after the proword "GROUPS." An alternate method is to insert the group count after the proword "GROUPS," and insert the word "SERVICE" as the first group of the text. Groups are not counted in service messages except when clarification is needed.

- ➢   Text   Reference your (priority/routine) TIME (date time group of the original message), from line, name only, and the reason for non-delivery. A request for disposition may also be included. Some reasons for non-delivery are:
     - No such address.
     - Addressee unknown.
     - No phone number available.
     - Unlisted phone number.

    1-3.2.2.   Sample. Actual text of a service message might be as follows:

REFERENCE YOUR ROUTINE TIME 022017Z JAN 1993 FROM GEORGE MARTIN TO JOHN SMITH, UNLISTED PHONE NUMBER PLEASE ADVISE.

    1-3.2.3.   Follow Up. The SERVICE message should have the DTG and message number of your originating service message. The DTG of the serviced message will never change. If the original message appears to be of some importance, you might send a second service message, if no reply is received within a reasonable time. The heading of the second service message except for a new message number and DTG as indicated above is the same as the original service message. Indicate at the beginning of the text that this is the second service message sent.

    Example: SECOND REQUEST REFERENCE YOUR ROUTINE 022017Z JAN
             1993

    1-3.2.4.   Action Of Originating Station's.

       1-3.2.4.1.   The originating station will ascertain from the originating party what action to take on the message, which cannot be delivered. Usually the originating party will request that the message be canceled. The final action on the part of the originating station is to send another service message to the final receiving station to cancel the message and file it. Sometimes this message will include the operating "Q" signal "QTA", which means to cancel the message. Originating and receiving stations should annotate their file copies accordingly

       1-3.2.4.2.   All messages may be mailed at the member's expense if the member so desires. No military stamps are to be used for messages that originate in the CONUS. There are currently no stamps furnished by the military. When they again become available, members will be notified.

       1-3.2.4.3.   The other type message AF MARS will be concerned with is the EEI (Essential Elements of Information) message. This type message will be covered in detail later in the manual.

7 Attachments
1. AF Form 427 Work Sheet (Overprinted)
2. AF Form 427
3. SHARES Form 1
4. SHARES Form 2
5. ARRL Message Form And Sample
6. MARS/Amateur Re-File Message
7. ARRL Numbered Messages

UNITED STATES AIR FORCE

MILITARY AFFILIATE RADIO SYSTEM

MESSAGE

MONTHLY STATION SEQUENTIAL MESSAGE NO. _____

_____ THIS IS _____ RADIO CHECK OVER
(Station called phonetics)   (Station calling phonetics)

Use back
of form
for
additional
groups.

MSG NO _____ _____ TIME _____Z_____
              (Precedence)   (Month) (Year)

FROM: _____ _____
         (Name of originator – spell out phonetically)   (MARS Call sign)

INITIALS or FIGURES _____ _____ ____
                       (Number) (Street name – phonetically)   (City)   (State)

FIGURES _____ PHONE FIGURES _____ HYPHEN _____ HYPHEN _____
          (Zip code)   (Area)   (Telephone number)

SLANT BAR _____
            (Originating station call sign and state/country)

....

TO: _____ _____
      (Name of addressee – phonetically)   (MARS call sign)

INITIALS or FIGURES _____ _____ ____
                       (Number) (Street name – phonetically)   (City)   (State)

FIGURES _____ PHONE FIGURES _____ HYPHEN _____ HYPHEN _____
          (Zip code)   (Area)   (Telephone number)

GROUPS _____ BREAK OVER (optional)
          (Number)

Listen for all requests – after "ROGER" send text (No ID required here)

_____ _____ _____ _____ _____ 05

_____ _____ _____ _____ _____ 10

_____ _____ _____ _____ _____ 15

_____ _____ _____ _____ _____ 20

_____ _____ _____ _____ _____ 25

_____ _____ _____ _____ _____ 30

BREAK OVER (Receiving station must ID here)

....

DISPOSITION OF TRAFFIC: MAILED _____ PHONED _____

TOR: _____ TOD: _____

REFILED TO ARS: CALL _____ MSG # _____ MONTH_____ DAY ____

THIS MESSAGE WAS HANDLED THROUGH THE COURTESY OF MARS. YOU MAY REPLY THROUGH STATION _____
ADDRESS_____

UNITED STATES AIR FORCE

MILITARY AFFILIATE RADIO SYSTEM

MESSAGE

THIS MESSAGE WAS HANDLED THROUGH THE COURTESY OF MARS. YOU MAY REPLY THROUGH STATION _____,
ADDRESS_____

AF Form 427 Sep 1962

Electronic Format

SHARES HF RADIO PROGRAM
STATION DATA FORM
SECURITY PROCEDURES AND PRIVACY ACT

ACTION: Add New Station ☐   Delete Station ☐   Update Station/ERP Data ☐   Add ERP ☐

PART I: NCSH 3-3-1 STATION DATA

1. ENTITY: _____   2. STATION LOCATION:

3. VOICE CALL SIGN: _____   City _____

4. BBS CALL SIGN: _____   State _____

5. STAR CALL SIGN: _____   6. STATION TELEPHONE:

7. ALE ADDRESS CODE: _____   Commercial _____   DSN _____

8. VOICE FREQUENCIES: 9. ALE FREQUENCIES:

Primary (*)   LSB (+)

1. _____ ☐   ☐   1. _____   5. _____
2. _____ ☐   ☐   2. _____   6. _____
3. _____ ☐   ☐   3. _____   7. _____
4. _____ ☐   ☐   4. _____   8. _____

10. STATION HOURS OF OPERATION: 1 - 24 Hours ☐   2 - Part Time/Duty Hours ☐   3 - On Call/Emergency ☐

11. STATION CAPABILITIES: (Check All That Apply)

SSB Voice	☐	HF E-mail	☐	GTOR	☐	HF Packet	☐
ALE (141b/1045b)	☐	Phone Patch	☐	AMTOR	☐	CLOVER	☐
PACTOR/PACTOR II	☐	MODEM (1052)	☐	CLOVER 2000	☐	STI	☐
STAR	☐	MODEM (110b)	☐	PSK31	☐	MT63	☐

PART II: SECURITY PROCEDURES AND PRIVACY ACT

Information contained in NCSH 3-3-1, SHARES Directory, carries a FOR OFFICIAL USE ONLY (FOUO) designation due to the compilation of station data. To participate in SHARES, a member must comply with the following security procedures for handling FOUO material as specified in NCSH 3-3-1, Chapter 1, para 1.9: (1) The information shall not be released in any manner to the public or other personnel who do not have a valid need-to-know, (2) the information shall not be photocopied or electronically reproduced, (3) when unattended, the information shall be stored in a locked container or in a room with sufficient physical access control measures to afford adequate protection to prevent unauthorized access, (4) when stored on a computer, the information shall be password protected, (5) the information shall be disposed of in such a manner as to ensure destruction beyond recognition and reconstruction, (6) upon leaving the SHARES program, the Project Office shall be notified of the date NCSH 3-3-1 is destroyed, and (7) the loss, compromise, suspected compromise, or unauthorized disclosure of the information shall be reported to the SHARES Project Office. Failure to comply with these security procedures to protect NCSH 3-3-1 information from unauthorized personnel shall result in removal from the SHARES program.

The information voluntarily provided on this Form 1 is covered by the Privacy Act of 1974. The information is stored on the Master SHARES Data Base and used by Project Office to contact SHARES members. Information contained in Part I of this Form 1 is also included in NCSH 3-3-1, SHARES Directory, and distributed to SHARES members as FOUO information. Failure to provide the information requested on the Form 1 may result in not being allowed to participate in SHARES.

PART III: ADMINISTRATIVE DATA

STATION POINT OF CONTACT OR ERP: ENTITY POINT OF CONTACT:

Name: _____

Address: _____   Name: _____

_____

_____   Entity: _____

Phone: _____ E-mail: _____

STATION POINT OF CONTACT OR ERP: I have read   ENTITY POINT OF CONTACT: I approve the Form 1
and understand the procedures contained in Part II of this Form 1.   request.

Signature _____ Date _____   Signature _____ Date _____

SHARES FORM 1
REV. 2/04

SHARES HF RADIO PROGRAM
MESSAGE FORM

_____ **THIS IS** _____
(CALLED STATION CALLSIGN)   (CALLING STATION CALLSIGN)

TIME: _____ (ZULU)
DAY   TIME   MONTH

FROM: _____
NAME   AGENCY   CITY   STATE   PHONE

TO: _____
NAME   AGENCY   CITY   STATE   PHONE

MESSAGE CONTAINS ( ) PARAGRAPHS

MESSAGE FOLLOWS

PARA 1 THIS IS A SHARES (EXERCISE) MESSAGE

PARA 2 _____

_____

_____

_____

_____

_____

_____

END OF MESSAGE   OVER

OPERATOR NOTES		
FOR MESSAGE RECEIVED	FOR MESSAGE TRANSMITTED	REMARKS
TIME: _____ TIME MESSAGE RECEIVED	TIME: _____ TIME MESSAGE TRANSMITTED	
FROM: _____ CALLSIGN	TO: _____ CALLSIGN	
FREQUENCY _____	FREQUENCY _____	
NAME: _____ OPERATOR	NAME: _____ OPERATOR	

SHARES FORM 2
REV 02/99

THE AMERICAN RADIO RELAY LEAGUE
RADIOGRAM
VIA AMATEUR RADIO

NUMBER	PRECEDENCE	HX	STATION OF ORIGIN	CHECK	PLACE OF ORIGIN	TIME FILED	DATE

To

THIS RADIO MESSAGE WAS RECEIVED AT

AMATEUR STATION _____ PHONE _____

OWNER _____

STREET ADDRESS _____

CITY AND STATE _____

TELEPHONE NUMBER

SENDER'S ADDRESS AND PHONE NUMBER FOR REFERENCE:

REC'D	FROM	DATE	TIME	SENT	TO	DATE	TIME

THIS MESSAGE WAS HANDLED FREE OF CHARGE BY A LICENSED AMATEUR RADIO OPERATOR, WHOSE ADDRESS IS SHOWN IN THE BOX AT RIGHT ABOVE. AS SUCH MESSAGES ARE HANDLED SOLELY FOR THE PLEASURE OF OPERATING, NO COMPENSATION, DIRECT OR INDIRECT, PAID OR PROMISED, CAN BE ACCEPTED BY A STATION OWNER. FOR THE SAME REASON, NEITHER EVENTUAL DELIVERY NOR ACCURACY OF COPY CAN BE GUARANTEED. ANY REPLY MAY BE FILED WITH THE STATION DELIVERING THIS MESSAGE TO YOU. FURTHER INFORMATION ON AMATEUR RADIO MAY BE OBTAINED FROM A.R.R.L. HEADQUARTERS, 225 MAIN STREET, NEWINGTON, CONN. 06111.

THE AMERICAN RADIO RELAY LEAGUE, INC., IS THE NATIONAL MEMBERSHIP SOCIETY OF LICENSED RADIO AMATEURS AND THE PUBLISHER OF QST MAGAZINE. ONE OF ITS FUNCTIONS IS PROMOTION OF PUBLIC SERVICE COMMUNICATIONS AMONG AMATEUR OPERATORS. TO THAT END, THE LEAGUE HAS ORGANIZED AN AMATEUR RADIO PUBLIC SERVICE CORPS (ARPSC), CONSISTING OF THE AMATEUR RADIO EMERGENCY CORPS (AREC) FOR WORK DURING EMERGENCIES, AND THE NATIONAL TRAFFIC SYSTEM (NTS) FOR DAILY NATION-WIDE MESSAGE HANDLING. THE TWO DIVISIONS SUPPLEMENT EACH OTHER IN DAILY OPERATION. MORE INFORMATION IS AVAILABLE FROM A.R.R.L. HEADQUARTERS. LITHO.—U.S.A.

I. Preamble
- a. Number (begin with 1 each month or year)
- b. Precedence (R, W, P or Emergency)
- c. Handling Instructions (optional)
- d. Station of origin (first amateur handler)
- e. Check (number of words/groups in text only)
- f. Place of origin (not necessarily location of station of origin)
- g. Time filed (optional with originating station)
- h. Date (must agree with date of time filed)

II. Address

As complete as possible, include ZIP code and telephone number

III Text

Limit to 25 words of less if possible

IV Signature

For more information on the ARRL message form, go to internet site:
http://www.arrl.org/FandES/field/forms/fad218.pdf

MARS/AMATEUR REFILE

RECEIVED VIA MARS

NR 55 ROUTINE
131430Z JAN 00
FROM MAJ A N COLE
BOX 372
APO AE 09130/AGA7PM GE
TO MRS A N COLE
8 MAIN STREET
NEW BOSTON PENNSYLVANIA 33221
TELEPHONE 804-832-7828

GR 17

BREAK

<u>ARRIVED SAFE AND WELL PACKAGE AND LETTER RECEIVED ON ARRIVAL
HAVE MAILED LONG LETTER LOVE SIGNED AL</u>

BREAK

REFILED TO AMATEUR SERVICE

NR 75 KF4SQ CK 18 GERMANY VIA MARS 143OZ JAN 13
TO MRS A N COLE
8 MAIN STREET
NEW BOSTON PENNSYLVANIA 33221
TELEPHONE 804-832-7828   BREAK

<u>ARRIVED SAFE AND WELL XRAY PACKAGE AND LETTER RECEIVED ON
ARRIVAL XRAY HAVE MAILED LONG LETTER XRAY LOVE</u> BREAK AL END OF
MESSAGE.

FROM MAJ A N COLE BOX 371 APO A.E 09130

NOTE
Underline words are those used to obtain the group count (CK) in both messages. The
FROM line address in the MARS message should follow the signature on re-file to amateur
service. When re-filing to the amateur service (ARS) use of "XRAY" for periods is optional
at discretion of the originating amateur station.

HQ ARRL publishes a card, which is useful for amateur traffic handlers. This card may be
obtained from HQ ARRL, at HAMFESTS (at the ARRL booth), and from section/station
ARS coordinators. The card is "Amateur Message Form, FSD-218(585)

ARRL Numbered Messages

Group One—For Possible "Relief Emergency" Use

ONE Everyone safe here. Please don't worry.

TWO Coming home as soon as possible.

THREE Am in _____ hospital. Receiving excellent care and recovering fine.

FOUR Only slight property damage here. Do not be concerned about disaster reports.

FIVE Am moving to new location. Send no further mail or communication. Will inform you of new address when relocated.

SIX Will contact you as soon as possible.

SEVEN Please reply by Amateur Radio through the amateur delivering this message. This is a free public service.

EIGHT Need additional _____ mobile or portable equipment for immediate emergency use.

NINE Additional _____ radio operators needed to assist with emergency at this location.

TEN Please contact _____. Advise to standby and provide further emergency information, instructions or assistance.

ELEVEN Establish Amateur Radio emergency communications with _____ on _____ MHz.

TWELVE Anxious to hear from you. No word in some time. Please contact me as soon as possible.

THIRTEEN Medical emergency situation exits here.

FOURTEEN Situation here becoming critical. Losses and damage from _____ increasing.

FIFTEEN Please advise your condition and what help is needed.

SIXTEEN Property damage very severe in this area.

SEVENTEEN REACT communications services also available. Establish REACT communication with _____ on channel _____.

EIGHTEEN Please contact me as soon as possible at _____.

NINETEEN Request health and welfare report on _____ . (State name, address and telephone number.)

TWENTY Temporarily stranded. Will need some assistance. Please contact me at _____.

TWENTY ONE Search and Rescue assistance is needed by local authorities here. Advise availability.

TWENTY TWO Need accurate information on the extent and type of conditions now existing at your location. Please furnish this information and reply without delay.

TWENTY THREE Report at once the accessibility and best way to reach your location.

TWENTY FOUR Evacuation of residents from this area urgently needed. Advise plans for help.

* Can be used all holidays

TWENTY FIVE Furnish as soon as possible the weather conditions at your location.

TWENTY SIX Help and care for evacuation of sick and injured from this location needed at once. Emergency/priority messages originating from official sources must carry the signature of the originating official.

Group Two—Routine Messages

FORTY SIX Greetings on your birthday and best wishes for many more to come.

FIFTY Greetings by Amateur Radio.

FIFTY ONE Greetings by Amateur Radio. This message is sent as a free public service by ham radio operators at _____. Am having a wonderful time.

FIFTY TWO Really enjoyed being with you. Looking forward to getting together again.

FIFTY THREE Received your _____. It's appreciated; many thanks.

FIFTY FOUR Many thanks for your good wishes.

FIFTY FIVE Good news is always welcome. Very delighted to hear about yours.

FIFTY SIX Congratulations on your _____, a most worthy and deserved achievement.

FIFTY SEVEN Wish we could be together.

FIFTY EIGHT Have a wonderful time. Let us know when you return.

FIFTY NINE Congratulations on the new arrival. Hope mother and child are well.

SIXTY* Wishing you the best of everything on _____.

SIXTY ONE Wishing you a very Merry Christmas and a Happy New Year.

SIXTY TWO* Greetings and best wishes to you for a pleasant _____ holiday season.

SIXTY THREE Victory or defeat, our best wishes are with you. Hope you win.

SIXTY FOUR Arrived safely at _____.

SIXTY FIVE Arriving _____ on _____. Please arrange to meet me there.

SIXTY SIX DX QSLs are on hand for you at the _____ QSL Bureau. Send _____ self addressed envelopes.

SIXTY SEVEN Your message number _____ undeliverable because of _____. Please advise.

SIXTY EIGHT Sorry to hear you are ill. Best wishes for a speedy recovery.

SIXTY NINE Welcome to the _____. We are glad to have you with us and hope you will enjoy the fun and fellowship of the organization.

Section II

Net Control

(NCS)

Training Manual

1 March 2006

USAF MARS

NET CONTROL TRAINING

FOREWORD

by

Guice W. Johnson

The Region 2 NCS program was developed with the cooperation and input of several members. The lack of Net Control procedures was highly noticeable. Each night each NCS used a different net procedure. This not only was unprofessional but confusing to the net members. There had to be a better way. Therefore a NCS training program was implemented.

EDITOR'S NOTE: Without the dedication and expertise of members like Mr. Guice Johnson, our entire net structure would not be the superbly fine tuned operation that Region 2 has had the distinction of having for many years. The Net Control Training guide has retained all of the most important features created by Mr. Johnson. Only certain administrative corrections have been implemented to accommodate the many changes in the AF MARS program.

Edited and updated by

Vic Carson – AFF2C/AFN2TD

1 Sept 2005

INTRODUCTION

In accordance with USAF MARS Operating Directives, all AF MARS nets are directed nets. This means that these nets are under the control of a central figure that we call the NET CONTROL STATION (NCS). The NCS is responsible for the overall net operation. He/she maintains the assigned net frequency, controls the proper traffic flow and provides for the most efficient use of the net time available.

The Net Control Training Program provides the basis for the development of an effective Net Control Station.

This program is divided into four parts. Three of these parts are on-the-air sessions of approximately one hour each. These sessions are strictly instructional.

The fourth part is the on-the-air certification. Each trainee is given the opportunity to be Net Control under the supervision of an instructor. Certifications will usually, but not always, require two or more sessions. The instructor will critique each session.

NCS training is the responsibility of the Region HF Voice Net Manager.

CONTENTS

Attachments

Session #1

REGION NCS TRAINING

2-1. REQUIREMENTS TO BE A GOOD NCS

2-1.1. The first requirement of a good Net Control Station is to be able to hear and to be heard. You must have a good transmitter/receiver plus an amplifier with a well-engineered antenna. All NCS equipment MUST be NTIA compliant.

2-1.2. The second requirement is an operator with excellent USAF MARS procedures who understands the use of correct procedures and prowords and has a desire to be a good NCS.

2-1.3. We assume that you have already been trained as a MARS operator and we will not try to teach you operator procedures. We will thoroughly cover Net Control procedures however.

2-2. NCS SELECTION AND ASSIGNMENT

2-2.1. Prospective NCS candidates are assigned to NCS training by their respective State MARS Directors on an AF Form 3661.

2-2.2. At the completion of training and certification, the NCS will be assigned, whenever possible, to a net of his/her choice.

2-2.3. It is hoped that we will soon have a minimum of two NCS assigned to each net. The extra NCS will be called the ANCS for alternate net control station. There is no difference between the NCS and the ANCS as both stations will alternate each week as NCS.

NET CONTROL STATIONS

2-3. RELATIONSHIPS

2-3.1. In every net operation, certain stations perform functions that are keys to an efficient operation. The operation must be looked at in terms of foreground and background operation. Foreground operations include those participants that are directly involved with net activity. They are responsible for the real-time operations occurring at that moment. The foreground components of a net are:

<div align="center">
Net Control Station
Alternate Net Control Station
Net Participants
</div>

2-3.2. Background operations are those functions relating to the administrative support and quality control of the present moment operation. They are ever present and serve to ensure control and support is provided to enable the foreground to function efficiently. The background components of a net are:

<div align="center">
Frequency Monitor
Net Manager
</div>

2-4. NCS AUTHORITY: The present purpose of the Net Control Station is to direct all net operations and activities. The Net Control Station has the absolute authority on net operations at the moment. His/her directive is the final decision on immediate net activity. It is very important that all Net Control Stations and participating members respect this authority.

2-5. NCS DUTIES AND RESPONSIBILITIES: The following is a list of activities for which the Net Control Stations are held responsible:

    2-5.1. Opening nets at prescribed times.

    2-5.2. Maintaining the net frequency.

    2-5.3. Directing participant activities.

    2-5.4. Direct traffic flow.

    2-5.5. Reporting infractions.

    2-5.6. Reporting interference.

    2-5.7. Maintain and report net time.

    2-5.8. Submit reports as required.

2-6. ALTERNATE NET CONTROL STATION: The term ANCS is used to identify a station that is prepared at all times to assume control of the net in the event the acting NCS is unable to continue.

2-7. ANCS DUTIES:

    2-7.1. The ANCS will copy along with the NCS and perform all log keeping functions as if he/she were controlling the net. Preparation to assume NCS duties at any time is the prime responsibility of the ANCS.

    2-7.2. As soon as traffic is listed, the ANCS should begin to plan traffic routing and be prepared to furnish this information to the NCS if requested.

2-8. SCHEDULING: ANCS is not a permanent assignment. Alternating between NCS and ANCS is mandatory in order to maintain proficiency and distribute the workload equally.

NCS/ANCS STATION REQUIREMENTS

2-9. TYPE OF EQUIPMENT: A necessary requirement for the NCS is a good transceiver or a good transmitter/receiver combination. The NCS must have the capability to hear and be heard throughout the region. This means that the transmitter and receiver must be in good condition and properly aligned. In case of a transceiver, the transmitter section must track the receiver section. That is, it must transmit on the exact frequency that the receiver is on. In order to be heard, an amplifier capable of maximum power output is a necessity. All NCS equipment MUST be NTIA compliant.

2-10. FREQUENCY STABILITY: Since the NCS must maintain the proper frequency (This will be covered in detail later) a highly stable frequency is required. A Temperature Compensated Crystal Oscillator (TCXO) or equivalent is considered necessary. A reliable frequency counter is also desirable. All NCS stations MUST have NTIA compliant equipment. (Redundancy intentional.)

2-11. ANTENNA SYSTEM: A good antenna system is one of the most important items of station equipment. A dipole or inverted "V" that is resonant at the operating frequency and properly erected will greatly improve an otherwise weak transmitted signal and will also improve receive capability. Room permitting, a resonate horizontal loop will provide a low noise superior gain antenna for region communications. Above ground antenna elevation will impact communications range in that lower elevation tends to reduce range and higher antenna elevation tends to increase range often skipping over intermediate stations. Experimentation is necessary to find the best arrangement for a given station depending on location within the region. A good feed line is one requirement that is sometimes overlooked or taken for granted. To get maximum power to the antenna use the best grade of RG8U, RG8X or one of the other types of low loss feed line available. Be sure to check all cable connections periodically for continuity and shorts. It is also important to check for moisture in the coax. All outside connections should be waterproofed.

2-12. GEOGRAPHIC LOCATION: During low sunspot activity antenna engineering is especially critical. A station that is located near the center of the Region can have a definite advantage in communication with a properly engineered antenna system with a relatively high radiation angle. Depending on propagation, a station at the region fringe could be experience spotty communication continuity across the region. Ideally the NCS and ANCS should not both be central or near the region fringe in order to minimize communication voids under poor propagation or high static conditions. Excessive traffic relays can cause long slow nets.

2-13. OPERATING POSITION: The operating position must afford sufficiently clear space to operate efficiently without distraction or clutter. Sufficient room for administrative activities will prevent a good deal of fatigue. The NCS must be constantly utilizing the net log, maps, ZIP code directory and traffic routing guides. All of this material consumes space and must be at fingertip reach.

2-14. NCS AIDS: To efficiently route traffic the NCS should acquire the following aids:

2-14.1.   Maps Of Each State: Rand McNally publishes a road atlas of the United States that has proven highly effective in locating Region traffic destinations. The maps for each state in this region should be tabbed and marked for quick access. Also, extending the XY grid lines on each map helps aid in locating a point when using the alphabetical listing of cities and towns.

2-14.2.   ZIP Code Directory: ZIP code directories are available from the US Post Office for a nominal fee. Many postmasters will donate last year's directory if you explain what it is to be used for. These ZIP directories are also available on the internet (www.usps.gov) and CD ROM.

2-14.3.   Region VHF Directory: The Region VHF coordinator – AFF#V, maintains the directory for all region VHF nets. This list serves to point out the last thread in the network for delivering traffic. It is available on request to all SMDs.

2-14.4.   NCS Log Sheets: The standard NCS log sheet must be used by all NCS/ANCS. Hq. USAF MARS does not furnish these forms. Each NCS is responsible for furnishing his/her own log sheets. A master copy suitable for duplication will be furnished by the HF net manager and is also included in this manual as attachment 2.

2-14.5.   Computer Aids: Some members have created an NCS logging/routing computer program. This will save much time by the NCS if available. Also, computer search engines can be very useful in locating cities within a state. One of the most reasonable cost software packages for such activity is Microsoft Roads and Trips and older editions, perfectly suitable for city locations searches, are often available for a small price.

Session #2

CONTROLLING NET OPERATIONS

NET CONTROL

The Net Control Station establishes the level of controlled activity or confusion on a net. The tempo of net activities is directly proportional to the precision of the net controls procedures, timing in the directing of traffic and ability to communicate under all circumstances.

2-15. NET CONTROL PROCEDURES: Net Control procedures must be executed with PROMPTNESS, PRECISION and CLARITY to ensure all stations being directed as well as those monitoring interpret the instructions exactly the same. It is extremely important that all Net Controls use exactly the same methods for the purpose of maintaining system quality control. Nothing creates confusion faster than an NCS who continually alters net procedural calls or a net whose control changes methods daily.

2-16. DIRECTING TRAFFIC: The method of directing traffic determines the efficiency of the net operation. Only so much time is available to pass all the listed traffic, and time spent doing anything else reduces the net efficiency. The NCS, along with the ANCS, must have at their disposal all the proper tools to quickly identify the routing of traffic. As soon as one piece of traffic is complete no time should be wasted in directing the next. Preparation and timing are critical to efficiency. The only time that should affect net efficiency other than traffic and directing it, is the administrative requirements for checking stations in or out or for frequency violations.

2-17. COMMUNICATIONS QUALITIES: All net control stations must possess a station with the ability to hear and be heard throughout the region under adverse conditions. Another equally important factor is the speaking style of the individual. In the interest of time many net controls tend to talk quickly and then find themselves being asked to repeat what they said. For many this is a difficult problem to overcome. The net control procedures have been designed to permit the communication of the directions precisely and in a short manner. The NCS should speak in a slow controlled and moderate tone. The sound of control and authority is a paramount attribute each NCS must project.

2-18. PROCEDURE INFRACTIONS: The control of stations that repeatedly interrupt net operations must be handled diplomatically. Methods for notifying stations of their actions will include: telephone, Email or letter. Net procedure monitors will initiate actions accordingly at their discretion or by notification of request for such action from the NCS. UNDER NO CIRCUMSTANCE WILL CORRECTIVE ACTION EVER BE GIVEN ON THE AIR.

2-19. ROLL CALL RADIO CHECK: Roll call/radio check will be performed at the discretion of the NCS. At no time will a Roll Call/Radio check interfere with normal net business. The NCS will announce to the net that a roll call/radio check follows. The NCS will start at the top of the log and call each station in order. Any station that does not answer will be called again at the end of the roll call/radio check. Stations that do not answer will not be given credit for that net. Should a station call later and indicate that they were on the phone, another net etc., the benefit of the doubt prevails and the station will be reinstated with no further discussion. Roll call/radio checks will **_not_** be given on one-hour nets.

2-20. FREQUENCY MONITOR STATIONS: The affiliate membership provides the technical support necessary to ensure that MARS net operations are maintained within prescribed frequency tolerance. The Frequency Monitor (FYMON) role is one of advisor to the NCS. The final authority on net frequency rests with the NCS.

2-21. FREQUENCY MONITOR DUTIES: Frequency monitor duties are to maintain proper frequency tolerance and to report any aberrations as may be necessary to the NCS. While FYMONs serve only as advisor to the NCS, they are tasked with the responsibility to report unresolved frequency tolerance infractions, interference and procedure problems.

NET CONTROL PROCEDURES

2-22. HIGH FREQUENCY NET OPERATIONS: The following is a sequence of events a Net Control Station must follow to conduct an affiliate-controlled traffic net on Region HF net frequencies. Each is defined in succeeding pages.

- CHECK FOR A NET CONTROL, FYMON AND ANCS.

- STATION TUNE UP PERIOD.

- FREQUENCY SETTING.

- NET OPENING.

- ROLL CALL.

- TRAFFIC AND NET BUSINESS.

- NET CLOSING.

   2-22.1. CHECK FOR A NET CONTROL: Before starting any HF net it is necessary to make certain that there is not another net on frequency. Even though these nets operate on assigned frequencies and at scheduled times, there is the possibility that the frequency may be in use. The following procedure will be used by the NCS:

"IS THERE A NET CONTROL ON FREQUENCY, OVER?" (Make this call twice)

If there is a response, inform the station on frequency that a net (using designator) is scheduled at this time. At this time the other station should relinquish the frequency. If; it is a Military Emergency, Civilian Government Emergency or Emergency Contingency Unit, delay starting the net until the frequency is free.

2-22.2. STATION TUNE-UP PERIOD: Because it is not permissible to tune equipment on frequency without the permission of the Net Control Station, a one minute period is provided for this purpose.

2-22.3. FREQUENCY SETTINGS: In order that all stations on the net are on the correct frequency, the Frequency Monitor will be afforded the opportunity to set the net frequency. It is the responsibility of the Frequency Monitor to correct any station transmitting out of frequency tolerance. It is the responsibility of the NCS, with the advice of the FYMON, to insure that all stations on the net are operating within the correct frequency tolerance. If there is no FYMON on the net, the NCS will establish the correct frequency. If a FYMON checks into the net later, that FYMON will assume the duties and become the FYMON of record. If the FYMON station does not respond at the net beginning, the NCS will set the net frequency using a long count.

2-22.4. NET OPENING: After all administrative activities are complete the net is now ready to begin the business for which it is intended. At this time the net is formally open. (The complete opening and closing checklist is included in later pages)

2-22.5. ROLL CALL: An orderly roll call procedure is a must to enable the NCS to properly list the traffic and log stations entering the net. A general call will be made to the net for any station in the Region with or without traffic using emergency power. Next, a general call is made to the net for stations with traffic. During periods of high traffic volume, the NCS will call each state in alphabetical order for their traffic listings. When this becomes necessary, the Net Manager will notify each NCS of the change in procedures. Next roll call will be for stations without traffic. This will be done alphabetically by states. All roll calls will be made twice. When conditions are poor, it is permissible to make several calls per state and the NCS may have the ANCS, FYMON, or other station to also make calls as he/she deems necessary to ensure that all stations are logged. After the roll call for stations without traffic, a general call is made for late stations with traffic. Next a general call is made for late stations without traffic. These general calls are also made at least twice. When the roll call is complete, check with your ANCS and determine if he/she needs any fills.

2-22.6. NET BUSINESS: The order in which traffic is handled:

2-22.6.1.   IMMEDIATE (Top priority traffic and/or announcements)

2-22.6.2.   OFFICIAL (HQ broadcasts, official traffic, HQ bulletins RMD bulletins etc.)

2-22.6.3.   PRIORITY (Includes regular priority messages or TRANSCON priority)

2-22.6.4.   ADMINISTRATIVE DISCUSSIONS (Must include one state or region official)

2-22.6.5.   TRANSCON (Routine - Must identify if training and what type unless regular traffic)

2-22.6.6.   ROUTINE OR MORALE (Regular traffic)

2-22.6.7.   ANNOUNCEMENTS (All except official from HQ or RMD)

2-22.6.8.   INFORMAL DISCUSSIONS (Not to exceed five minutes)

2-22.7. Routine traffic will be handled as follows:

2-22.7.1.   PRIORITY TRANSCON then ROUTINE TRANSCON (Routine TRANSCON will follow administrative discussions) (All TRANSCON traffic MUST be identified as training or regular. All training TRANSCON messages must be sent to AFF#T or his designated stations.)

2-22.7.2.   ADMINISTRATIVE DISCUSSIONS. An administrative discussion is defined as a discussion concerning MARS activities of a nature that requires immediate attention not satisfied by normal administrative channels. One party of this type discussion must be a USAF MARS Official, Region MARS Official or a State MARS Director. This can, of course, include the NCS on duty.

2-22.7.3.   ROUTINE REGION. Interstate region traffic.

2-22.7.4.   ANNOUNCEMENTS. (Region non-official announcements etc.)

2-22.7.5.   INFORMAL DISCUSSIONS. An informal discussion is a discussion concerning MARS activities and not necessarily including any MARS official. These discussions can include any subject relating to MARS activities and must not exceed a period of more than five minutes. If stations exceed this limit, the following procedure will be executed:

> NCS: (between transmissions) "ALL STATIONS WAIT. THIS IS (call-sign) NET CONTROL"
>
> The NCS will then make a NET CALL. After the NET CALL is complete and if there is no more business brought before the net, the NCS may allow the informal to continue for no more than five minutes.

2-23. TRAFFIC DISTRIBUTION:

2-23.1. Traffic will be directed to the station nearest the traffic destination, if there is only one station checked into the net from the state of destination, that station will handle the traffic. Traffic should never be redirected to another station within a state without the NCS permission.

2-23.2. There will be times when a station in a state other than the state of destination will be closer than the station directed to take the traffic. Do not direct the traffic to that station unless the station in the neighboring state offers and definitely indicates acceptance.

2-23.3. Do not show favoritism to any one station or state. Direct traffic in an equitable manner. Do not unload any one station holding traffic while ignoring another. A reasonable number of messages to be directed at any one time are two or three depending on conditions.

2-24. ROLL CALL/RADIO CHECK: Performing a roll call/radio check seems to confuse some stations. The NCS will announce to the net: "#S1 THIS IS _____ROLL CALL/RADIO

CHECK FOLLOWS." The NCS will then call each station in turn starting at the top of the log. An example follows: "AFA#XX THIS IS _____ OVER. You do not need to repeat ROLL CALL/RADIO CHECK as this has already been announced. The station called will respond: "THIS IS _____ HAVE YOU LOUD AND CLEAR (or whatever the signal is) OVER." The NCS will respond with, "I HAVE YOU LOUD AND CLEAR (or whatever the signal is), OUT." No roll calls will be made on one-hour nets.

Session
#3

TRAFFIC NET PROCEDURES

2-25. DIRECTING TRAFFIC: The following is a typical example of the procedures that must be followed by the NCS when directing net activities:

> "AFA#SB (phonetically) THIS IS AFB#AO (phonetically), SEND ONE
> ROUTINE MEMPHIS TENNESSEE TO AFA#RN (phonetically) OUT." The
> sending station will then call the station receiving the traffic to determine
> readability, and if satisfactory, will proceed with the traffic.

2-26. NET CALLS: The NCS will make a net call at least every fifteen minutes. An example follows: "#S1 THIS IS AFB#AO (phonetically), OVER." This is a signal for stations to enter the net, list traffic or request to close. The net call will be made at least twice. The net call can be made more frequently if traffic conditions permit. And, when net conditions are poor the ANCS or FYMON may also be asked to make a net call.

2-27. CLOSING STATIONS: The NCS will close a station as in the following example: "THIS IS AFA#PU REQUEST TO CLOSE, OVER." The NCS will respond with: "AFA#PU, I HAVE YOU CLOSED, OUT." It is absolutely improper to say anything else after this statement.

2-28. RELAYING: The ANCS or FYMON will normally act as a relay for stations that are hard to hear. In some cases the ANCS or FYMON may also be unable to hear the station. In this case any station may offer to relay. An example of the procedure is as follows: "THIS IS AFA#ZV, MAY I RELAY, OVER." The NCS will respond with: AFA#ZV, PLEASE RELAY, OUT." The proword "OUT" is used to signal the relaying station that he/she may call the weak station to get the complete information needed to conduct the relay if necessary. Many stations volunteer relays ONLY relays requested by the NCS may be made. When several stations attempt to relay or make corrections it creates confusion. The NCS should advise "ALL STATIONS WAIT" when this situation occurs and begin again when the confusion abates.

2-29. DUAL TRANSMISSIONS: There will be many occasions when dual transmissions occur. The NCS may not necessarily hear all stations involved. When these situations occur and the ANCS or FYMON cannot copy the station, any station hearing the dual transmission may advise with: "THIS IS AFA#ZE DUAL TRANSMISSION, OUT." The NCS will respond with "THIS IS AFA#XX ROGER, OUT" and then immediately make a net call to allow the unknown station or stations to respond.

2-30. FREQUENCY VIOLATIONS: When the FYMON calls the NCS to indicate a frequency violation, the following dialog is used: "THIS IS AFF#F FREQUENCY MONITOR, OVER." The NCS will respond with "ROGER AFF#F FREQUENCY MONITOR, OUT". This response by the NCS indicates to the FYMON that he/she is clear to call the station in violation and correct his/her frequency. When the correction is completed, the NCS will resume net business.

2-31. NET CLOSING: This appears to be an awkward time for some NCS. It is not necessary for the NCS to say "Any station with net business before we close?" or "We thank everyone for

their participation". No comment is required except the normal net closing procedure. The following example of net closing procedure will be used:

> "THIS IS AFA#XX CLOSING THE #S1 NET. THIS NET WILL MEET AGAIN AT (**TIME**) date/time/month/year_, OUT" (All times in zulu). The date and time will be said numeral by numeral phonetically. The month will not be said phonetically. The entire four numerals of the year will be said phonetically numeral by numeral. The proword "TIME" must precede the DTG.

> **HAND-OFF FREQUENCY:** When the traffic load exceeds the amount that can normally be passed in a two hour period, the NCS should request the use of an alternate (or hand-off) frequency. The following guidelines will be used in conjunction with hand-off frequencies. Most regions have a single handoff frequency. If other frequencies are needed as hand-off frequencies, the NCS may send the FYMON to the TRANSCON net and request the temporary use of one of their frequencies. When you decide that you are going to need a hand-off frequency, ask the FYMON of record to check the conditions on the hand-off and report back to you accordingly. If the hand-off frequency is usable, it is necessary to send a FYMON or the ANCS to establish the frequency. Next, direct the station holding the traffic to go to the hand-off frequency. Next you direct the stations that are to receive the traffic to go to the designated hand-off frequency and direct which traffic they are to receive. Remind them to return to the primary net frequency when they have completed traffic. Do not send more than five stations to receive traffic to the hand-off frequency at any one time. As each station returns to the primary net, direct another station to go to the hand-off for designated traffic. When all traffic is complete on the primary net frequency, you should send someone down to the hand-off and get all stations to return to the primary.

> **INFORMAL DISCUSSIONS ARE NOT PERMITTED ON HAND-OFF FREQUENCIES!**

2-32. NCS TRAFFIC LOGS:

   2-32.1. Every NCS/ANCS is responsible for keeping an accurate log recording the net's activities. Affiliate members are sensitive to receiving proper credit for their MARS activity and expect accounting measures to be efficient. All NCS/ANCS must use the same log keeping methods to assure time is reported accurately and the information is available for analysis purposes. Log sheets from the NCS/ANCS will be made available to the Net Manager upon request. The net manager will send the NCS condensed report to the Operations Analysis Manager (AFF#0) each quarter.

    2-32.2. The following is a description of the prescribed method to be used for traffic logs. Attached is a sample log sheet is included to be used for duplication. Other forms may be used but the information listed below MUST be included on the log.

        2-32.2.1.   HEADING INFORMATION.

            2-32.2.1.1. NET CONTROL/FYMON/ALTERNATE NET CONTROL. The call signs of these stations assigned to the net are listed. They will also list any traffic they may have at their check-in time.

            2-32.2.1.2. NET DESIGNATOR. For the traffic net concerned.

            2-32.2.1.3. DATE. The date /time, month/year is logged, (zulu time only)

            2-32.2.1.4. TIME NET OPENED, (zulu)

            2-32.2.1.5. TIME NET CLOSED, (zulu)

        2-32.2.2.   NCS TRAFFIC LOGGING

            2-32.2.2.1. TIME IN/OUT. Check-in/out time of the station.

            2-32.2.2.2. STATION CALL. Callsign of the member station.

            2-32.2.2.3. STATION LOCATION. City and state of station.

            2-32.2.2.4. LIAISON. "F" for FYMON. "A" for ANCS. "T" for TRANSCON. ". The designator for any VHF net is shown as liaison.

            2-32.2.2.5. TRAFFIC HANDLED. Numerical designator for traffic directed to that station.

            2-32.2.2.6. TRAFFIC LISTED. Traffic listed by that station. All traffic must be listed by city and state.

2-33. MARKING THE LOG FOR TRAFFIC FLOW.

    2-33.1. Each traffic listing will be numbered sequentially beginning with the first listing and ending with the last listing given on the net. The traffic listing number will then be noted in the "TRAFFIC HANDLED column adjacent to the station that the traffic will be routed through.

    2-33.2. As each listed piece of traffic is handled, the NCS will line out the listing and also the corresponding number in the "TRAFFIC HANDLED" column.

    2-33.3. The letter "P" will indicate PRIORITY traffic. The letter "A" will indicate ADMINISTRATIVE traffic, and the letter "I" to indicate INFORMALS.

2-34. QUARTERLY REPORTS: Quarterly reports are normally compiled by each NCS using the MARSTIME computer program. Each NCS submits their consolidated net

participation reports to the Region Net Manager (AFF#N). NCS reports are then consolidated and subsequently submitted to the Region Operation Analysis Manager AFF#O. The NCS report will include, callsign and participation times of each station. It will also include a consolidated report on all traffic handled by the NCS for the quarter as a last entry using the pseudo callsign TFC followed by the quarter's traffic total count.

3 Attachments:
1. Net Opening/Closing Procedure
2. NCS Log Sheet (1 blank)
3. NCS Net Roll Call Log

Net #S1 Opening and Closing Procedures

THIS IS _____ IS THERE A NET CONTROL ON FREQUENCY? "OVER" (Call twice)
                 (NCS)

THIS IS_____, IS THE FYMON MONITORING? "OVER"
             (NCS)

THIS IS _____, IS THE ALTERNATE NET CONTROL MONITORING? "OVER"
               (NCS)

FOLLOWING IS A PERIOD FOR ALL STATIONS TO TUNE EQUIPMENT. YOU MAY TUNE FOR ONE MINUTE, "OUT"

THIS IS _____ THE FOLLOWING PERIOD IS FOR STATIONS TO ADJUST FREQUENCY.
                  (NCS)
(fymon call-sign), SET THE NET FREQUENCY, "OUT"

#S1 THIS IS _____. LOCATED IN _____FIRST CALL WILL BE FOR STATIONS WITH TRAFFIC. SECOND CALL WILL BE FOR STATIONS WITHOUT TRAFFIC

STATIONS WITH OR WITHOUT TRAFFIC USING EMERGENCY POWER, "OVER" (Call twice)

STATIONS REGION # WITH TRAFFIC, "OVER" (MAKE THIS CALL TWICE)
STATIONS WITHOUT TRAFFIC IN ___STATE___, "OVER" (CALL EACH STATE AT LEAST TWICE)
                NOTE: Repeat for each state in alphabetical order within the region

THIS COMPLETES ROLL BY STATES. ARE THERE ANY LATE STATIONS WITH TRAFFIC? "OVER" (CALL AT LEAST TWICE)

REGION STATIONS TO ENTER THE NET, "OVER" (CALL TWICE)

ANCS DO YOU NEED ANY FILLS? "OVER"

#S1, THIS IS _____NET CONTROL. THE FYMON IS _____THE ALTERNATE NET CONTROL IS_____.
            (NCS)   (FYMON)   (ANCS)

ALL STATIONS WAIT. "OUT" (BEGIN DIRECTING ANY TRAFFIC)   (MAKE NET CALLS AT LEAST ONCE EVERY 15 MINUTES as #S1 THIS IS _____, "OVER")

Closing Procedure

#S1, THIS IS____CLOSING THE #S1 NET. THIS NET WILL MEET AGAIN AT (TIME)___ OUT. The Date Time Group will be given as indicated earlier in this guide with the year said phonetically in four digits

NCS TRAFFIC LOG

Page   of   Pages

NCS:	Net Designator:	Freq Mon
ANCS:	Time Opened:	Time Net Closed
Date:		Credit Until:

TIME IN/OUT	Station Call	Station Location	Liaison	Traffic Handled	Traffic Listed

NET ROLL CALL

DATE _____ NET OPEN _____ LOG NUMBER _____ SHEET 1 OF _____

DESIGNATION _____ FREQUENCY _____ NET CLOSED _____ Z MEET AGAIN _____ Z

#	TIME IN	CALLSIGN	LOCATION	STATE	CLOSING	SIGNAL				REMARKS: TFC LISTED, POSN (FMON, BEACON, TRANSCON, LIAISON TO, NET ANNOUNCEMENTS, ETC.	HRS
						CK	CK	CK	CK		
1										NCS	
2										ANCS	
3										FYMON	
4											
5											
6											
7											
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#	TIME IN	CALLSIGN	LOCATION	STATE	CLOSING	SIGNAL				REMARKS: TFC LISTED, POSN (FMON, BEACON, TRANSCON LIAISON TO, NET ANNOUNCEMENTS, ETC.	HRS
						CK	CK	CK	CK		
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#	TIME IN	CALLSIGN	LOCATION	STATE	CLOSING	SIGNAL			REMARKS: TFC LISTED, POSN (FMON, BEACON, TRANSCON LIAISON TO, NET ANNOUNCEMENTS, ETC.	HRS
						CK	CK	CK CK		
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DATE _____ DESIGNATION _____

#	TIME IN	CALLSIGN	LOCATION	STATE	CLOSING	SIGNAL				REMARKS: TFC LISTED, POSN (FMON, BEACON, TRANSCON, TRANSCON LIAISON TO, NET ANNOUNCEMENTS, ETC.	HRS
						CK	CK	CK	CK		
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Section III

National ECOM Plan 2006-1

By
HARRY L. MARSTERS II, CMSgt, USAF
National Emergency Coordinator (AFN1EC)

1 March 2006

Authorized by Headquarters Air Force MARS
For Air Force Training

Contents

Attachments

DEPARTMENT OF THE AIR FORCE
Air Force Communications Agency
Military Affiliate Radio System (MARS)

National Emergency Communications (ECOM) Plan 2006-1   1 March 2006
Reference(s): USAF MARS Operating Instruction (MOI)
        AFI 33-106, Managing High Frequency Radios, Land Mobile Radios, Cellular
        Telephones, and the Military Affiliate Radio System
        FEMA Federal Emergency Response Plan
        DOD Directive(s) 4950.1

3-1. SITUATION: A disaster condition may result from a catastrophic earthquake, significant natural disaster, weapons of mass destruction attack or other incident that produces extensive damage and results in large volumes of requests from all levels of government authority for services required to save lives and alleviate human suffering. Authorities require accurate and timely information on which to base their decisions and focus their response actions. Widespread damage to commercial telecommunications facilities is likely. At a time when the need for real-time electronically processed information is greatest, the capability to produce it may be seriously restricted or nonexistent. All surviving telecommunications assets of the various levels of government, augmented by extra-regional assets, will be needed immediately to assure a proper response to the needs of victims of the event.

    3-1.1. General. This ECOM plan serves as a general guide for USAF MARS stations conducting emergency operations during emergency, disaster and contingency operations and serves as a basic plan and template from which local plans should be developed. This plan, used in conjunction with regional and local plans, provides guidance for use in the event that a situation exists or is projected which threatens life and/or property and/or causes a state, federal, or military official to declare an emergency or disaster for a specific geographic area. This plan also applies to contingency operations.

    3-1.2. Situation Management. Local and/or state emergency management officials, augmented by communications support from MARS as needed, accomplish the primary response to emergency or disaster events. MARS members are not to enter into the management of the emergency except for actions required to employ MARS and to maintain the safety of MARS personnel.

3-2. MISSION: The USAF MARS mission is to provide radio communications that:

    3-2.1. Augment Department of Defense (DOD) emergency and disaster preparedness and response operations by providing primary or back-up communications links between DOD organizations and to federal response agencies.

    3-2.2. Enhance Defense Support to Civilian Authorities (DSCA) during emergency and disaster response and recovery operations by providing state and local authorities with communications links to DOD and federal response agencies.

3-2.3. Provide Essential Elements of Information (EEI) reports to the National Emergency Coordinator – AFN1EC. EEI Reports provide critical information regarding emergency and or disaster situations that could adversely impact life, limb or otherwise impede the Public Safety. EEI Reports provide insight into availability and limitations of local infrastructure. This information should be forwarded to appropriate local, county and state emergency management and emergency response agencies if included as part of the local and state communications support plan.

3-3. SUPPORTED ORGANIZATIONS AND AGENCIES:

Department of Defense
U.S. Northern Command (USNORTHCOM)
Joint Director Of Military Support (JDOMS)
National Communications System (NCS)/Shared HF Resources (SHARES).
Federal Emergency Management Agency (FEMA)
National Guard
Local and State Emergency Management Agencies
Other organizations and agencies as directed

3-4. PLANNING: Disaster and emergency response begins at the local levels. MARS ECOM planning must begin within each state. State level planning and organization provides state emergency planners with known resources which, when tasked, can provide primary or secondary communications links to Military and federal response agencies and organizations.

3-4.1. All three MARS services must plan for a coordinated joint MARS response and be prepared to serve as a single supplier of emergency communications. Locally, the three services should develop a joint response plan and combine resources to maximize resources (manpower, equipment, networks and frequencies) and capabilities. Emergency planners should see MARS as one organization. Army, Navy-Marine Corps and USAF must work as partners.

3-4.2. Joint planning should include support to National Guard and active duty military installations each state. State MARS Directors (SMDs) and State Emergency Coordinators (SECs) must be proactive in the involvement and coordination of MARS support within the state.

3-4.3. Planning should begin with the National Guard Headquarters in each state. This should be accomplished with the Joint Forces Headquarters (JFHQ) J6 function (Command, Control, Communications, and Computer (C4) Systems Directorate). JFHQ typically provides Operational Control (OPCON) of National Guard resources in each state, in support of the state's Office of Emergency Management (OEM) or Emergency Management Agency (EMA) requirements. MARS must be an integral part of the overall emergency and disaster communications architecture in order to be considered part of the state response plans.

3-4.4. Planning should include liaison with Amateur Radio Emergency Service (ARES), Radio Amateur Civil Emergency Service (RACES), and the Civil Air Patrol (CAP). Typically, these organizations are already in place and providing the critical "on-scene" communications links to and from the local, county and state Emergency Operations Centers (EOCs).

Coordinated efforts will help define the role of each of the communications services and enable each to focus on its primary role within the state's communications architecture. Liaison with ARES and RACES will generally provide direct communications links into the local, county and state Emergency Operations Centers (EOCs) in the affected area.

3-5. ASSUMPTIONS:

3-5.1. Upon activation of the SHARES "SCN" (Shares Coordination Net) and or FEMA "NECN (National Emergency Coordination Net), USAF MARS will immediately activate TRANSCON Voice Nets and ECOM Nets in the area(s) affected by the emergency/disaster that has resulted in the SHARES and FEMA activations. TRANSCON will provide support to SHARES, FEMA and MARS regional and state ECOM Nets in the affected region(s) as required.

3-5.1.1. If an actual emergency or disaster occurs and MARS has not yet received official notification of the FEMA or SHARES net activations, FEMA Liaison and SHARES stations should monitor FEMA and SHARES frequencies and be prepared to provide liaison support.

3-5.2. Upon activation of ARMY MARS ECOM Nets, USAF MARS will also activate ECOM Nets in the affected areas and TRANSCON Net(s) and prepare to support the emergency or disaster response. NOTE: HQ ARMY MARS serves as the primary liaison with JDOMS.

3-5.3. Upon activation of USAF MARS regional ECOM Nets, TRANSCON Voice will activate its nets or extend its operations to provide liaison between regions and federal agencies and serve as a gateway for ECOM related traffic between MARS regions and other government agencies (FEMA, SHARE, etc.) responding to and supporting an actual event or exercise.

3-5.4. Upon activation of MARS ECOM nets during "actual" ECOM operations, MINIMIZE will be imposed on TRANSCON digital networks. Only mission essential and ECOM related traffic will be passed on the networks until MINIMIZE is lifted by the National ECOM Manager or National Digital Manager.

3-5.5. MARS ECOM ALERTS/BROADCASTS serve as immediate guidance for supporting ECOM operations. These broadcasts may also provide interim changes in this plan or the MARS Operating Instruction (MOI) as it pertains to ECOM operations and are considered directive in nature. Alerts/broadcasts will be distributed throughout USAF MARS by all available modes of communications including Digital, Voice and EMAIL. Alerts and broadcasts will be broadcast on all voice nets (Phone Patch nets will use their administrative nets only for this purpose).

3-5.6. MARS stations outside affected emergency/disaster areas (including exercise areas) are asked to monitor regional and TRANSCON frequencies and be available to assist relaying traffic and with deliver of traffic whenever possible.

3-5.7. MARS Joint Service Operations are directed at all levels of MARS operations. MARS will, when possible, serve as one-entity and support ECOM operations as needed.

Effective use of each other's available resources will be coordinated at the lowest levels of management when possible.

3-6. COMMAND AND CONTROL:

3-6.1. State, Regional and National MARS officials operate under the authority assigned by the Chief, USAF MARS, or designated authority, and in accordance with (IAW) the USAF MARS Operating Instruction (MOI) and this plan. These officials may task appropriate CONUS, regional and or state ECOM support within their jurisdictions as needed, based upon reliable knowledge that an emergency or disaster situation (or exercise) is imminent or has already occurred, and when MARS ECOM operations will enhance contingency operations or emergency/disaster response and recovery efforts.

3-6.2. The State MARS Director (SMD) is the only state official authorized to commit USAF MARS affiliate resources within their jurisdiction. These responsibilities may be designated to the SEC.

3-6.2.1. The State MARS Director (SMD) will appoint a State Emergency Coordinator (SEC) who will serve as the OPR (Office of Primary Responsibility) for all State Level ECOM issues and operations, under the direction and guidance of the SMD and REC.

3-6.2.2. More than one SEC may be appointed. Each SEC will have responsibility for a specific geographic region. All SECs will work together to provide ECOM support statewide.

3-6.3. The Region MARS Director (RMD) has overall responsibility for coordination of USAF MARS support by affiliate members within the jurisdiction. The RMD or REC may assign Affiliate Stations to serve as liaison to FEMA and or other agencies as required to coordinate MARS ECOM support and handle traffic during exercises, emergencies, disasters and contingency operations.

3-6.3.1. The Region Emergency Coordinator (REC) will serve as the OPR (Office of Primary Responsibility) for all ECOM issues in the region, under the direction and guidance of the RMD and National ECOM Manager (NEC), and will coordinate ECOM support as needed within the jurisdiction.

3-6.4. The National Emergency Coordinator/Manager (NEC) is the focal point and OPR (Office of Primary Responsibility) for all USAF MARS ECOM activities including planning, exercises, contingency operations and actual emergencies/disaster support. National level guidance is provided as needed to national, regional and state level MARS operations.

3-6.4.1. The NEC serves as the USAF liaison for Joint MARS operations at the national level, coordinates USAF MARS support of joint MARS operations and provides direction and guidance for national, regional and state joint ECOM operations as needed.

3-6.5. The National Guard JFHQ in each state typically provides primary Operational Control (OPCON) of National Guard military resources in each state, in conjunction with the State Office of Emergency Management or Emergency Management Agency. Joint MARS

coordination efforts should include the JFHQ Command, Control, Communications, and Computer (C4) Systems Directorate (J6).

3-7. TASKED EQUIPMENT AND NETWORKS: The equipment and networks employed during ECOM operations are determined by the situation and mission requirements.

    3-7.1. Except for military stations, equipment may be either government and privately owned and maintained by individual MARS members.

    3-7.2. Equipment and networks are made available at no charge, in support of the DOD, the public interest and safety.

    3-7.3. Fixed station High Frequency Single Sideband (HF/SSB) radio systems provide beyond line of site non-secure voice and digital communications to support ECOM operations.

    3-7.4. Limited mobile, transportable and portable HF/SSB systems may be available for deployment within each region. Tasking is on a voluntary basis depending upon the available resources. The Military or Government is not liable for accidents or deaths during deployment.

    3-7.5. Limited VHF/FM voice and digital resources are available to support local ECOM operations. Each state's VHF/FM capabilities and infrastructure varies. Tasking is on a voluntary basis.

    3-7.6. TRANSCON (Transcontinental) voice and digital networks provide CONUS wide communications links and provide a gateway between regional jurisdictions. TRANSCON networks also serve as the primary gateways for federal response agencies to enter ECOM traffic into the MARS networks.

    3-7.7. USAF MARS Phone Patch Nets are available to any and all stations operating from within a disaster area, and requiring Phone Patch capabilities to conduct OFFICIAL ECOM business.

      3-7.7.1. Phone Patches are made by placing "COLLECT" calls to the party being called, by the Phone Patch Operators. This must be briefed and understood by those placing calls from the disaster area.

      3-7.7.2. The following briefing will be given when initiating Phone Patches:

> *(SIR/MA'AM) THIS IS A NON-SECURE RADIO CIRCUIT. PLEASE SAY THE WORD "OVER" EACH TIME YOU FINISH TALKING. USE LAST NAMES ONLY. THE USE OF FULL NAMES, RANK AND GEOGRAPHICAL LOCATIONS ARE NOT ALLOWED. OBSCENE OR PROFANE LANGUAGE IS TRICTLY PROHIBITED. DO NOT DISCUSS CLASSIFIED INFORMATION OVER THE AIR. ADVISE PERSONNEL IN THE AREA THAT YOU ARE DOING A NON-SECURE PHONE PATCH AND BACKGROIUND NOISES WILL BE TRANSMITTED OVER THE RADIO. DO YOU HAVE ANY QUESTIONS (SIR/MA'AM)?*

3-8. EXECUTION:

3-8.1. CONCEPT OF OPERATIONS:

3-8.1.1. General. The purpose of USAF MARS ECOM operations is to provide primary, secondary or alternate communications links with which to expedite the flow of emergency and routine message traffic into and out of a disaster area. USAF MARS stations, in a state and/or region where an emergency situation is imminent or occurring, will activate all available communications resources to conduct ECOM operations, including radio (voice and digital modes), wire-less and wire based communication assets, and assets belonging to other MARS Services IAW ECOM plans. MARS emergency operations can simultaneously support several agencies and several phases of the MARS mission. MARS emergency operations will continue until terminated at the request of user agencies or determined to be no longer required by MARS officials.

3-8.1.2. Purpose. The primary purpose is to provide communications support to, local, state and federal emergency/disaster response by providing communications links between local, state, federal response agencies and DOD resources.

3-8.1.2.1. The secondary purpose is to provide communications links to send infrastructure status reports from a disaster area via AFN1EC to the Joint Director of Military Support (JDOMS) using the Essential Elements of Information (EEI) reporting program.

3-8.1.2.2. The third purpose is to provide communications links to provide morale, health and welfare (H& W) communications support into and out or a disaster areas. During disaster support addresses may not meet the specific MARS message formatting requirements for addresses and phone numbers. MARS station handling this type of traffic will make every effort to deliver H&W traffic and deliver it to its destination.

3-9. ALERTING:

3-9.1. Notification. Upon notification of a potential or current emergency/disaster event within a jurisdiction, state and regional leadership will immediately notify:

3-9.1.1. Affiliate members by the most expedient method possible depending upon the nature of the pending or current event

3-9.1.2. Army and Navy-Marine Corps MARS Points of Contact within the affected state/area

3-9.1.3. National ECOM Manager by sending an EMERGENCY/ CONTINGENCY PLAN ACTIVATION message by EMAIL. (See attachment 1)

3-9.1.4. In the event that neither the SMD nor SEC is available, affiliate members will notify the other affiliates in their jurisdiction, brief them on the situation and instruct them to monitor the appropriate Net frequencies and wait for further instructions.

3-9.1.5. Affiliates will notify the REC and obtain assistance and guidance if needed. When contact is made with the SMD or SEC, they will assume command and control of the situation and provide appropriate guidance and take appropriate action.

3-9.2. ECOM ALERT (CONDITION) CODES: The ECOM CONDITION CODES serve the same function as the Warning Order and Operations Order. These are considered authorization to implement the ECOM actions directed by each condition. Alert Codes may begin at the level most appropriate for the current situation.

3-9.2.1. Any member may initiate an ECOM ALERT Condition in the absence of the SEC, SMD, or Region officials; however, attempts to contact these designated authorities shall be made prior to and after a member initiates the Alert Condition. The member initiating the Alert Condition is also responsible for ensuring that the telephone Alerting system and ECOM Nets are activated.

3-9.2.2. When broadcasting Alert Conditions, ensure that the geographical areas that are, or may be affected, are identified.

3-9.2.3. Unless an emergency or disaster situation is local and requires no outside support, ECOM Alerts are applicable to the entire region. Actions taken by stations outside the emergency or disaster (affected) area may vary depending upon the support required.

3-9.3. ECOM Conditions.

ECOM CONDITION 5

Normal Day-to-Day Communications Operations. Broadcast ECOM CONDITION 5 to notify Stations to resume normal operations when ALERT CONDITIONS are no longer required.

ECOM CONDITION 4

Conditions exist that may develop into potential emergency/disaster situations over the next few days. NOTE: This is primarily used for potentially severe weather ALERTS issued by the National Weather Service and should be used any time severe weather is predicted <u>take the following action(s):</u>

- Stay Alert to News and Weather reports for potential problems.
- Be prepared to change ECOM Conditions to higher Readiness levels
- Check-in to regular State, Area, and Region Nets for current information.

ECOM CONDITION 3

An emergency or disaster situation is expected to develop within 48 hours <u>take the following action(s):</u>

- Monitor regular and/or Primary ECOM Net Frequencies.

- Check into Nets to obtain the latest information.
- Monitor designated Joint Service frequencies and systems, for Local or State Wide situations.
- For Region Wide situations, Monitor the Primary REGION ECOM Frequencies
- Activate the Alerting System. Ensure that all members are aware of the potential emergency/disaster situation.
- Encourage all to check-in to regularly scheduled Nets for the latest updates on the potential situation.
- Take preliminary precautions: Test emergency power, locate essential equipment and supplies, review ECOM Plan, etc.
- Continue normal MARS operations and REMAIN ALERT.
- Continue preparing for ECOM operations.

ECOM CONDITION 2

An emergency or disaster situation is anticipated within 24 hours take the following action(s):

- Take all actions required to activate all ECOM operations on short notice (In addition to actions taken in ECOM Condition 3).
- Maintain close contact with State and Region Officials for guidance and up to date information. STAY ALERT!
- Monitor regular and/or ECOM nets for updated information
- Take appropriate actions to protect family and property
- Ensure that food and water supplies and other personal items are readily available.
- Establish Regularly Scheduled Broadcasts of updated information regarding the potential emergency/disaster situation

ECOM CONDITION 1

An emergency or disaster is imminent take the following action(s):

- Suspend all normal operations
- Activate All ECOM Networks (NETS) and ECOM Plan(s)
- Take final actions to protect family and property.
- Check-in to ECOM Nets and monitor (Guard) closely
- For Local and Statewide situations, check-into appropriate Joint Service NETS and be prepared to help as needed.

ECOM CONDITION 0 (ZERO)

An Emergency or Disaster situation exists take the following action(s):

- Same actions as ECOM Condition 1
- Ensure that all available ECOM Nets and systems are in full operation
- Provide ECOM assistance to Local and State and Federal Emergency management Agencies as needed.

3-10. TASK(S): Establish and maintain the following communications capabilities as required by the situation:

3-10.1. ECOM Net Operations:

3-10.1.1. The Net Control Station (NCS) will activate ECOM Nets and assign an Alternate NCS (ANCS) to assist with activities. Nets will be directed and strict Net procedure will be followed during ECOM operations.

3-10.1.2. In the absence of an "officially designated or assigned" NCS, any affiliate member may activate an ECOM Net.

3-10.1.2.1. An "official" NCS may assume control of the net when available. All information and net rosters will be transferred to each new NCS. Any USAF MARS station may serve as NCS or ANCS and provide whatever assistance is needed.

3-10.1.3. The NCS will obtain the current ECOM ALERT Condition from available state or region officials. If none of the officials are available, use the guidance in this plan and issue an ECOM ALERT CONDITION. Ensure that this is passed on to each NCS and ANCS when Net Control stations change.

3-10.1.4. The NCS and Alternate NCS will maintain a log of all activities.

3-10.1.5. Regional and national MARS officials, designated liaison stations (SHARES, FEMA and TRANSCON) and TRANSCON Digital stations will identify themselves during Check-in.

3-10.1.6. The NCS will obtain the current communications capabilities from stations checking in from the emergency or disaster area. These capabilities should include modes of operation (HF, VHF, digital, telephone, cellular phone, fax, etc.), emergency power availability, portability or mobility of each station.

3-10.1.7. Liaison station(s) will be assigned to other agency nets (FEMA, SHARES, TRANSCON, etc.) as required. NOTE: Joint Service Liaison Stations will not be required if a pro-active Joint Service MARS program exists and Joint Service stations are on the net frequency.

3-10.1.8. Radiotelephone/phone patch and Digital modes may be used on any ECOM voice net with approval of the NCS, if applicable to the current emergency situation and when in the best interest of expediting the flow of ECOM message traffic.

3-10.2. State ECOM Operations

3-10.2.1. States affected by an emergency or disaster will immediately alert all State MARS members and activate State ECOM Nets on assigned frequencies IAW local ECOM Plan.

3-10.2.2. Ensure that Army and Navy - Marine Corps MARS leadership has also been notified of the situation and implement Joint operations. Joint Service operations should be activated immediately and Joint resources should be used to support the emergency, disaster or contingency.

3-10.2.3. Regional HF Frequencies may be used when state and Joint service frequencies are not available or insufficient to support HF operations. Select a frequency that will provide the best propagation coverage to all direct supporting stations (stations within the affected area). Frequency availability problems should be forwarded to the NEC immediately for action.

3-10.2.4. VHF Voice and Digital operations may be conducted as required and IAW local MARS ECOM Plans.

3-10.2.5. Establish a gateway into TRANSCON Digital networks for out of region message traffic and EEI reports.

3-10.2.6. SMD or SECs will notify the Regional MARS Director (RMD) or Emergency Coordinator (REC) and request Regional support for State operations if needed.

3-10.2.7. State level Nets operating non-regional nets will provide liaison to the Regional Nets that will serve as a gateway (link) outside of the affected area.

3-10.2.8. Establish Liaison to ARES, RACES and CAP if applicable. ARES and

3-10.2.9. EEI Reporting is <u>critical</u> to provide the NEC with the status of existing infrastructures in a disaster area. All MARS Stations in a disaster stricken area should accomplish EEI reporting. Every possible effort will be made to draft and send an EEI Report to AFN1EC.

3-10.2.9.1. USAF MARS stations aware of any emergency or disaster situations) or operating in a disaster area with conditions which could adversely impact life, limb or otherwise impede the public safety, regardless of how minor it may appear, will immediately prepare and send EEI reports to AFN1EC to ensure that the most current information is available, in order to make an assessment on what emergency action, if any, should or needs to be taken; and how best to proceed given the information obtained from EEI reports.

3-10.2.10. Net Control Stations will maintain accurate logs of all activities on the net.

3-10.2.11. Net Control Stations will monitor the availability of all liaison stations and TRANSCON Digital stations to ensure that a gateway to other nets and digital modes exists.

3-10.3. Regional ECOM Operations

3-10.3.1.   The Primary emphasis on Region-wide Operations will be for the purpose of supporting local, state, or area operations in effected areas.

3-10.3.2.   At the direction of the Chief, National ECOM Manager, Regional MARS Director, designated representative (REC, RVNM) or any other region official, a HF Radio voice Command and Control (C2) Net will be established on the primary or alternate Regional Nets for the purposes of:

3-10.3.2.1.   Coordinating emergency/disaster communications support for State MARS ECOM operations.

3-10.3.2.2.   Providing local and State MARS ECOM Operations with "GATEWAYS" (Links) into agencies such as FEMA, SHARES and other federal and military agencies supporting emergency, disaster and contingency operations.

3-10.3.2.3.   Frequencies will be determined by the geographical area involved, type of support, time of day and propagation conditions.

3-10.3.3.   Establish liaison to TRANSCON Voice Net(s) to ensure that incoming and out going traffic has an outlet beyond the region and into FEMA, SHARES and other federal agencies networks.

3-10.3.4.   Establish liaison with SHARES Coordination Net (SCN) if SHARES is activated. Registered SHARES should provide the liaison and gateway between SHARES and MARS Regional/TRANSCON nets. SHARES frequencies are published in the National Communications System Handbook 3-3-1 normally published in SHARES Readiness Notice.

3-10.3.5.   Regions where an emergency or disaster has occurred or is imminent, should establish liaison with the FEMA NECN (National Emergency Coordination Net) as directed. Only stations in the affected disaster area and surrounding region(s) should check into the FEMA NECN. All other liaison stations should "monitor" and be prepared to assist with message relays and traffic handling as needed. Liaison stations provide the MARS gateway to FEMA networks.

3-10.3.5.1.   The MARS Regional NCS will identify FEMA NECN liaison stations when calling the net. Liaison to FEMA NECN should be maintained throughout the duration of the ECOM operation.

3-10.3.5.2.   Liaison stations should utilize the FEMA frequency that best supports propagation from your area to FEMA. FEMA NCS locations and assigned frequencies are identified in their activation messages.

3-10.3.6.   Identify TRANSCON Digital stations on the Nets and ensure that traffic is routed from voice nets to digital networks whenever possible to expedite ECOM traffic and EEI Report handling and minimize congestion on voice nets.

3-10.3.7.   Establish liaison to Joint Service Coordination Nets as required. Frequency designators are typically provided in alert messages if available. TRANSCON may also be used for this purpose during large-scale ECOM missions.

3-11

10.4. National ECOM Operations

3-10.4.1. TRANSCON Voice Nets will be activated and maintained to provide a gateway for incoming and out going ECOM traffic from the Disaster area.

3-10.4.1.1. Stations outside the disaster area should check into TRANSCON voice Nets and be available to help handle traffic.

3-10.4.1.2. Identify TRANSCON Digital stations on the Nets and ensure that traffic is routed from voice nets to digital networks whenever possible to expedite ECOM traffic and EEI Report handling and minimize congestion on voice nets.

3-10.4.2. TRANSCON DIGITAL networks will be utilized whenever possible to expedite the flow of traffic.

3-10.4.2.1. SYSOPS will monitor their networks and ensure that traffic is flowing in a timely manner.

3-10.4.3. MANNED Digital nets play a critical role in ECOM and are encouraged, especially when dedicated point to point links to and from the disaster area will enhance message handling.

3-10.5. Joint Service Operations

3-10.5.1. State, area (multi-state), and regional Joint Service ECOM Operations are authorized and strongly encouraged. Prior planning, coordination and training enables members of all three MARS services to interoperate with one another on each others networks efficiently, effectively and accomplish the ECOM mission.

3-10.5.1.1. Good working relationships with Army and Navy-Marine Corps MARS will allow for smoother transition into ECOM operations when needed. Joint use of HF/SSB Voice and Digital (Multi-mode) Nets consolidates resources and frees up limited frequencies for Region or Area wide operations. Combined VHF resources will enhance local Joint operations.

3-10.5.2. Any MARS station from any service or federal agency station will be recognized and allowed access to USAF MARS Nets during ECOM Operations. USAF MARS stations will provide assistance and guidance to stations from other services and agencies when they check in to USAF Nets.

3-10.6. Essential Elements of Information (EEI) Reporting:

3-10.6.1. Essential Elements of Information (EEI) reports are critical reports provided to the National Emergency Coordinator – AFN1EC which provide insight into availability and limitations of local infrastructure during and immediately following an emergency or disaster event. These situations are reported because there is a potential that the event has or could adversely impact life, limb or otherwise impede the Public Safety. EEI Reporting is an ongoing mission supported by MARS.

3-10.6.1.1. JDOMS is engaged in gathering, packaging, and presenting information to the Army (executive agent for Defense Support to Civilian Authorities) and Department of Defense (DOD) leadership.

3-10.6.2. This information may also be forwarded to appropriate local, county and state emergency management and emergency response agencies if included as part of the local and state agency's communications support plan. HQ Army MARS and the USAF NEC also provide the information to a variety of DOD operations centers when applicable.

3-10.63. EEI Reports should be submitted to AFN1EC using the most expedient manner possible and as soon as possible once the information is received regarding an emergency or disaster event. The information provided in EEI reports may be critical to the assessment of the infrastructure and the potential need for DSCA. At a time when the need for "Real Time" electronically processed information is greatest, the capability to produce it may be seriously restricted or non-existent. EEI'S will be needed immediately, to help ensure that a proper response is available.

3-10.6.3.1. ***Every MARS member must be proficient in generating EEI Reports***

3-10.6.3.2. EEI reports must be sent as soon as possible during or immediately after an emergency or disaster occurs.

3-10.6.3.3. All actual EEI reports (non-exercise) should be sent directly to:

3-10.6.3.3.1. Check the latest ECOM broadcasts for updates to the reporting addresses.

3-10.6.3.3.2. Send all actual and exercise EEI reports to the NEC (AFN#EC) by EMAIL to the addresses listed on attachment 5.

3-10.6.3.3.3. The NEC will forward actual EEIs to various DOD EOCs and JOCs (Joint Operations Centers) when applicable.

3-10.6.3.4. Reports must be submitted using the format in attachment 3. <u>DO NOT SEND EEI **REPORTS** AS EMAIL **ATTACHMENTS.**</u> Paste them into your email software in the text box and in the format identified in attachment 3.

3-10.6.4. All MARS Members are asked to send EEI Reports if you are aware of any disaster or emergency situation which could adversely impact life, limb or otherwise impede the public safety, regardless of how minor it may appear.

3-10.6.4.1. Reports should include bridges or roads washed out, widespread power lines down, wind or tornado damage, heavy rains, flooding, heavy snow, forest fires, etc. Include large scale accidents with HAZMAT (Hazardous Materials) or Chemical spills

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3-10.6.4.2. Local fires and traffic accidents that don't affect more than a small portion of the local population probably don't need to be reported. Fires engulfing city blocks or neighborhoods and major accidents on highways blocking traffic should be reported.

3-10.6.4.3. EEI reports require common sense. **<u>DO NOT REPORT SEVERE WEATHER WATCHES OR</u>** <u>WARNINGS.</u> This information is already available to AFN1EC and other agencies. However, if during the severe weather, conditions adversely impact life, limb or otherwise impede the public safety, report them.

3-10.6.4.4. Follow-up EEI reports may be sent using the same EEI formats and addresses with updated information. These are not normally required, but for large scale emergencies or disasters that will require lengthy response and recovery operations they may be needed to update AFN1EC, especially when information from normal channels is limited.

3-11. LOGISTICS:

3-11.1. USAF MARS affiliates will normally operate from their home stations unless situations require deploying to specific operating locations. Most USAF MARS stations are not deployable. AF MARS stations will <u>never</u> be mandated to deploy. <u>Deployment is strictly voluntary and the Military or Government is not liable for injuries or deaths that may occur.</u>

3-11.2. USAF MARS affiliates should be equipped and prepared to deploy (on a voluntary basis) from their normal operating locations and establish communications links and systems required to support organizations and agencies involved in emergency/disaster operations if they choose to do so. <u>The USAF assumes no responsibility for any injury or death incurred if a station deploys.</u>

3-11.3. USAF MARS affiliate stations should be capable of operating on emergency power.

3-11.4. Commercial power sources should be used whenever possible in order to conserve batteries and other emergency power sources.

3-11.5. USAF MARS affiliates should be capable of integrating their equipment, systems, and operating procedures with other DOD and Emergency Management and Military agencies. This can only be accomplished by participation in Joint Service Exercises

3-11.6. USAF MARS Military Auxiliary Stations and Base Support Teams (BST) will operate IAW the USAF MARS Operating Instruction, Air Force Instructions, and applicable installation Disaster Preparedness and USAF MARS ECOM Plans.

3-12. RECORDS: (Logs & Reports)

3-12.1. Logs. Accurate and complete logs will be maintained by each Net Control Station (NCS) in order to account for USAF MARS participation in any operation, as well as serve as a key source of information for review and analysis of USAF MARS effectiveness. Logs should include number of messages transmitted/originated & received and any pertinent information.

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3-12.2.   Situation Report (SITREP). A SITREP <u>must be submitted daily</u> for each 24-hour (0001Z - 2359Z) period throughout the entire length of the ECOM operation (actual or exercise). The SITREP from the previous 24-hour period (0001Z - 2359Z) will be submitted to the NEC daily no later than (NLT) 1600Z daily via EMAIL. (See attachment 7 for format and information required)

3-12.2.1.   A SITREP will be submitted by each NCS to the Regional Voice Net Manager (RVNM) or designated representative. These should be submitted by each NCS immediately following the ECOM net session.

3-12.2.2.   A SITREP will be submitted to the RVNM or designated representative, for consolidation into a daily report covering the 24-hour period (0001Z - 2359Z), throughout the entire length of the ECOM operation (actual or exercise).

3-12.2.3.   The RVNM or designated representative will send the consolidated SITREPS to the NEC via EMAIL by 1600Z daily during ECOM operations (including exercises). Info the SEC and REC IAW local ECOM plans. (See attachment 7 SITREP format)

3-12.2.4.   TRANSCON Voice and Phone Patch Nets are requested to submit a SITREP only when engaged in ECOM operations support. Net managers or designated representatives should submit a SITREP IAW paragraph 3.12.2. using the format in attachment 7.

3-12.3.   After Action Report (AAR). An AAR is ***mandatory*** for all ECOM exercises and actual operations. The AAR provides a significant tool for managers, at all levels, to use to evaluate MARS operations. After-action reports not only identify potential limitations, but they also provide valuable information on specific portions of an operation that worked well and those that didn't work so well and require improvements. (See attachment 2)

3-12.3.1.   Regional and State Emergency Coordinators (RECs and SECs) will collect and consolidate statistics and the information needed to complete an AAR for each of their jurisdictions. Emergency coordinators are responsible for an AAR submission to the NEC following each MARS exercise (MARSEX) or actual ECOM operation. The NEC should receive an AAR from each state and each region involved in the ECOM operations and MARSEX.

3-12.3.2.   An AAR should be submitted within 5 working days of termination of the ECOM operation or MARSEX and sent to the NEC via EMAIL. Send an INFO copy to the RMD and SMD.

3-12.3.3.   Reports should be submitted in message format IAW attachment 2.

3-13. SAFETY:

3-13.1.   All possible precautions will be taken to prevent accidents or injuries to all MARS affiliates and other persons. The Military or Government assumes no liability.

3-13.2.   Antenna systems and equipment will be installed in such a manner as to minimize physical, electrical, and RF radiation safety hazards.

3-13.3.   Safety is the Number One Priority for all MARS Members.

3-14.   SECURITY:

3-14.1.   OPSEC: During ECOM operations all communications should be on a need-to-know basis. The items listed below are considered Critical Information (CI) and should be treated as FOR OFFICIAL USE ONLY (FOUO):

- Units/agencies participating in the mission
- Dates and times of the mission
- Systems tasked
- Call signs and frequencies associated with users
- Security weaknesses
- Physical security at deployed sites
- Any VIP itineraries
- Capabilities of Communications Equipment
- Operations schedules
- After Actions Reports and lessons learned

3-15.   DISTRIBUTION:

3-15.1.   The NEC will distribute this plan to MARS leadership and to HQ USAF MARS via EMAIL distribution.

3-16.   RMDs and SMDs will ensure this is distributed to all MARS stations within their respective jurisdictions.

3-16.1.   This plan in its entirety will not be placed on public websites. **Frequency designators and frequency lists will be removed before posting on public websites.** Contact the NEC for copies to be posted on websites.

HARRY L. MARSTERS II, CMSgt, USAF
National Emergency Coordinator (AFN1EC)

9 Attachments:
1. ECOM Plan Activation Message
2. After Actions Report Format
3. Essential Elements of Information Format
4. Essential Elements of Information Event Identifiers
5. Essential Elements of Information Routing (EMAIL and DIGITAL Addresses)
6. Sample Essential Elements of Information Message
7. SITREP
8. Sample SITREP
9. Record of Changes

(Attachment 1)
ECOM PLAN ACTIVATION MESSAGE

PRECEDENCE: IMMEDIATE
FROM: (YOUR CALLSIGN & STATE)
      TO: AFN1EC ME
 INFO: REC
      RMD

BT
(ACTUAL EVENT or MARSEX)
SUBJECT: ECOM PLAN ACTIVATION MESSAGE
1. SITUATION: *(Nature of the emergency)*
2. REQUESTER: *(Name and Title of requester of USAF MARS support)*
3. LOCATION: *(Affected location or area)*
4. APPRAISAL: *(Severity of the emergency. Estimate of communications needs and circuits to be established)*
5. COMMUNICATIONS: *(Identify the level of communications support required/anticipated. Identify the Nets tasked to support this ECOM operation activated include: TRANSCON, Regional, State, Joint, TRANSCON Digital, Regional and State Digital Networks etc.).*
6. REMARKS: *(Pertinent information not mentioned above. Include a narrative overview of the ECOM operation)*
(ACTUAL EVENT or MARSEX)
BT
NNNN

(Attachment 2)

AFTER ACTIONS REPORT

PRECEDENCE: ROUTINE

FM SEC or REC *(Name/Call sign/State)*

TO AFN1EC

INFO *(IAW Local/Regional Plans)*

BT

(ACTUAL EVENT or MARSEX)

SUBJ   AFTER ACTIONS REPORT

1. NATURE OF THE EVENT REQUIRING SUPPORT:

A. PARTICIPATING STATIONS: *(List Call signs)*

B. NET CONTROL STATION (S):   *(List NCS Call signs)*

C. LOCATION(S):   *(Event Location)*

D. DEPLOYED MARS STATION(S):   *(List Call signs and deployed locations)*

E. BRIEF DESCRIPTION OF OPERATION: *(Narrative)*

F. HOW WERE YOU NOTIFIED OF THE EMERGENCY:

G. WEATHER CONDITIONS DURING OPERATIONS:

H. PROPAGATION CONDITIONS: *(List Time/Date/Frequency/Conditions)*

I. NUMBER OF MESSAGES PROCESSED:

J. NUMBER OF MESSAGES ORIGINATED:

K. NUMBER OF EEI MESSAGES PROCESSED:

2. PROBLEMS OR ISSUES ENCOUNTERED/OBSERVED: *(List problems or issues)*

A. PROVIDE NARRATIVE DESCRIPTION OF PROBLEMS/ISSUES: *(Include positive and negative)*

B. RECOMMENDATIONS OR SUGGESTIONS FOR IMPROVEMENTS:

3. MEDIA RECOGNITION: *(list media sources, attach copies or provide links/URLs)*

(ACTUAL EVENT or MARSEX)

BT

NNNN

(Attachment 3)

ESSENTIAL ELEMENTS of INFORMATION (EEI)

PRECEDENCE: PRIORITY *(Actual* Reports)/ROUTINE *(MARSEX & Training)*
FM (Members Name/Call sign/State)
TO AFN1EC/ME
INFO RGN EC *(DO NOT INCLUDE EMAILADDRESSES)*
     RGN DIR
     STATE DIR
     STATE EC
        (INFO copies IAW local and regional ECOM Plans via Email and digital)
BT
SUBJ: *(ACTUAL EVENT/EEI or MARSEA9*
1. REF: *(APPLICABLE EVENT IDENTIFIER/STATE/DATE OF EVENT)*
A. **AREA IMPACTED BY INCIDENT:** *(Date and time of the incident, specify town, city, county or state-wide area)*
B. **STATUS** OF **EMERGENCY MEDICAL FACILITIES:** *(Operational, Damaged, destroyed, or Field Facilities needed, Not Applicable)*
C. **STATUS** OF **LOCAL TRANSPORTATION FACILITIES:** *(Indicate which Roads are affected and status - open, restricted, closed, damaged, destroyed, Not Applicable. Which Bridges are open restricted, damaged, destroyed. What is local airport and status - open, restricted, destroyed, unknown. What is the local railroad and status - operating, restricted, destroyed, unknown. The objective is to provide enough information to disaster relief officials to aid in deciding how to get assistance into the affected area).*
D. **EXACT LOCATION** AND **CHARACTERISTICS** OF DAMAGE: *(General description of damage or impact of incident or Not Applicable, on major structures such as government buildings, schools, residences, commercial property, public facilities, fire stations, etc. Identify location of shelters if applicable).*
E. **STATUS** OF **AREA UTILITIES:** *(Gas, water, commercial power, sanitation systems - operational, damaged, destroyed, needed, Not Applicable)*
F. **STATUS** OF **COMMERCIAL COMMUNICATION FACILITIES:** *(Telephone, Radio, TV, Cellular Phone - Operational, Damaged, Unavailable, Not Applicable.)*
G. SOURCE OF INFORMATION: *(Indicate Source of information if different from Date Time Group of the message. Include MARS Call sign, name of official and agency, radio/TV station Call sign or network as applicable).*
H. REMARKS: *(Include Comments about expected changes in status of any of the above items such as Power Companies expect power to be out for more than how many hours. If applicable, include expected time of next report).*
ACTUAL EVENT/EEI or MARSEX: *(Same as subject line)*
BT
NNNN

(Attachment 4)

EVENT IDENTIFIERS

EVENT:	IDENTIFIER:
AIR CRASH	FALLEN STAR
AIRBORNE POISONED GAS	POISONED AIR
BIOLOGICAL EVENT	BAD BUG
BOMBING INCIDENT	LOUD BANG
BRIDGE DAMAGE/LOSS (MAJOR)	LOST SUPPORT
CHEMICAL SPILL	POISONED GROUND
CIVIL UNREST/RIOT	BAD MAGIC
COMMUNICATIONS LINK DOWN (MAJOR)	LOST COMM
DAMAGING HAIL	FALLING ICE
EARTH QUAKE	ROLLING THUNDER
FLOOD	TALL WATER
FOREST/GROUND FIRE	SCORCHED EARTH
GAS LEAK/EXPLOSION (MAJOR)	HOT AIR
HEAVY WIND (OTHER THAN HURRICANE OR TORNADO)	MIGHTY WINDS
HURRICANE	HOWLING WIND
ICY ROADS	BLACK ICE
INTERSTATE BLOCKED/DAMAGED (MAJOR)	BLOCKED LANE
NUCLEAR	NUCLEAR GRAYSTONE
OIL SPILL (WATER)	DARK WATER
POWER OUTAGE (MAJOR)	DARK DAY
SEARCH/RESCUE	SECURE HAVEN
SEISMIC SEA WAVE	TSUNAMI
SHIP WRECK/INCIDENT	DEEP SEA
TERRORIST THREAT	HIDDEN SHADOW
TORNADO	VIOLENT TWISTER
TRAIN WRECK/DERAILMENT	BROKEN TRACKS
VOLCANO	BRAZEN BRIMSTONE
WATER DAM BROKE/DAMAGED (MAJOR)	FAST WATER
WINTER SNOW STORM	WHITE BLANKET
COMMUNICATIONS SUPPORT ROLE(S):	**IDENTIFERS:**
NATIONAL COMM SYSTEMS (NCS) SUPPORT	TOP COVER
JOINT CHIEFS OF STAFF (JCS) SUPPORT	JOINT LIONS
NATIONAL DISASTER MEDICAL SYSTEM (NDMS) SUPPORT	MED LINK
SHARES SUPPORT	COMMON FORTUNE
NATIONAL GUARD/RESERVES SUPPORT	CIVIL COVER
FEMA SUPPORT	FED LINK

(Attachment 5)

EEI MESSAGE ROUTING

EMAIL ADDRESSES:

    NEC

    AFNIEC(c~AOL.COM **and** HARRY.MARSTERS@MEBNGR.ANG.A.F.MIL

DIGITAL ADDRESSES (TRANSCON DIGITAL ADDRESSES) :

    NEC:

    AFNIEC ct,AFA1PZ.ME

INFO ADDRESSEES SHOULD ONLY BE USED DURING EMAIL TRANSMISSIONS.
MORE THAN ONE ADDRESSEE LISTED ON DIGITAL MESSAGES REQUIRES
SEPARATE MESSAGES TO EACH ADDRESSEE

(Attachment 6)

SAMPLE EEI MESSAGE

DE AFA#PZ NR 0101 P 261730Z JAN 05
FM JOHN DOE/AFA#PZ ME
TO AFN1EC/ME

INFO RGN EC
       RGN DIR
        STATE DIR
        STATE EC
BT
ACTUAL EVENT/EEI
1. REF: TALL WATER
A.   26 JAN 05 1600Z GREATER PORTLAND AREA
B.   NOT AFFECTED
C.   FLOODING ON MANY SECONDARY ROADS. ALL ROADS PASSABLE AT
      THIS TIME
D.   NOT AFFECTED
E.   NOT AFFECTED
F.   NOT AFFECTED
G.   SAME AS ABOVE
H.   RAIN EXPECTED FOR SEVERAL HOURS. ROADS EXPECTED TO GET WORSE.
      POTENTIAL FOR CLOSING OF MANY SECONDARY ROADS POSSIBLE LATER
      TODAY.
ACTUAL EVENT
BT
NNNN

(Attachment 7)

SITUATION REPORT (SITREP)

NET SITREP Format:
PRECEDENCE: PRIORITY
FM   (NAME)/(CALLSIGN) (STATE)
TO   AFN1EC ME
      SMD
      RMD
      REC
      RVNM
BT
ACTUAL EVENT *(Include Event ID and State)* or MARSEX
SUBJECT: SITREP
1. NET OPENING/CLOSING TIME:
2. NET DESIGNATOR:
3. TOTAL STATIONS:
4. NUMBER OF EEI REPORTS:
5. TOTAL MESSAGES HANDLED:
6. REMARKS: *(Provide a brief overview of the MARS mission and communications being provided)*
ACTUAL EVENT *(Include Event ID and State)* or MARSEX
BT
NNNN

(Attachment 8)

SITREP SAMPLE

DE AFA#JQ NR 023
R 031200Z APR 97
FM   HENSLEY/AFA#JQ SC
TO   AFF#SC
      AFF#C
      AFF#E
      AFF#N
BT
MARS EXERCISE TALLWATER SC
1.   031101Z – 031700Z APR 97
2.   2S1
3.   23
4.   18
5.   25
6.   FLOODING DUE TO HEAVY RAINS CREATING MAJOR ROAD CLOSURES AND LIMITING TRANSPORTATION. MARS IS PROVIDING EEI REPORTS AND LINKS TO AND FROM THE STATE EOC VIA ARES LIAISON. COMBINATION OF VHF PACKET, HF VOICE, RTTY, COMMERCIAL FAX AND EMAIL USED TO SEND ALL MESSAGE TRAFFIC TO REQUIRED DESTINATIONS.
MARS EXERCISE TALLWATER SC
BT
NNNN

DEPARTMENT OF THE AIR FORCE
Air Force Communications Agency
Military Affiliate Radio System (MARS)

RECORD OF CHANGES

This page will reflect all changes or amendments posted in this document.

Change/Amendment		Entered By	
Number	Authority	Date Entered	(Signature)

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SECTION IV

Frequency Monitor (FYMON) Procedures

CONTENTS

Frequency Monitor Procedures and Requirements

4.1. GENERAL INFORMATION. The term FYMON is an acronym for the term Frequency Monitor.

 4.1.1. FYMONs are chosen for their unique expertise and ability to utilize specialized equipment. It is required that all FYMON stations possess a frequency counter, a highly stable NTIA compliant transmitter and some method for reading received frequencies using a spectrum analyzer or other specialized frequency readout.

 4.1.2. FYMON stations will act in an advisory capacity to the Net Control Station (NCS) and advise the NCS when a station is off frequency or has some signal aberration that needs correcting. The NCS may then request the net FYMON to attempt to correct the problem.

 4.1.3. All FYMON stations must develop the ability to determine when a station is off frequency by listening to the harmonics or voice color of the transmitting station. This is generally done by ear and is an acquired talent. Off-frequency stations can generally be detected by ear when they exceed plus or minus 20 Hz.

 4.1.4. It is imperative that all FYMON stations use NTIA compliant equipment. All FYMON stations should be tested quarterly to determine their ability to perform their respective tasks. The region Chief FYMON will hold nets for this purpose each quarter. The required FYMON frequency readout tolerance is plus or minus 5 Hz. The required maximum frequency tolerance for <u>all</u> stations is plus or minus 20 Hz.

 4.1.5. No FYMON station will be certified unless they are using NTIA compliant equipment and can satisfactorily demonstrate their ability to handle their respective jobs to the satisfaction of the Chief FYMON.

 4.1.6. FYMON stations act only as advisors to the NCS and will NEVER take any action to close a station.

4.2. VOICE NET PROCEDURES. The following procedures have been adopted by the AF MARS for all FYMON stations and should be used whenever possible on all voice nets.

 4.2.1. The Net Control Station will call on the FYMON of record to set the net frequency at the beginning of all voice nets. When the FYMON is called upon to set the voice net frequency, the FYMON will first give a long count followed by an accurate signal for all stations to tune to. There are different methods of transmitting signal standards. One often-used method is the FATTO (**F**requency **A**djusting **T**wo **T**one **O**scillator). This method utilizes a pair of harmonically related tones that can be tuned by any SSB receiver to achieve the exact frequency that the FYMON is transmitting. The details of the FATTO can be found on most MTS nets. Other methods us a single tone which can get the receiving station within the required tolerance. The FYMON usually sends the signal standard for a period of one minute. Other methods are available and can be found on most MTS and FYMON nets in all regions.

4.2.2.   During the course of the net, the FYMON station may encounter a station that is off frequency. The FYMON should then call the NCS and announce AFA#XX this is AFA#AA frequency monitor "OVER". The net control station will then say "ROGER" AFA#AA frequency monitor "OUT". The FYMON will then call the station in question and say "AFA#BB this is AFA#AA frequency monitor. Please give a short count "OVER". The FYMON will then determine if the station is high or low in frequency and make the necessary corrections. Sometimes a station may have distortion or other signal problems. The procedure will be the same

4.2.3.   Sometimes the scheduled FYMON will not be present and another FYMON station may take the place of the scheduled FYMON. In these cases, the temporary FYMON will automatically relinquish his/her position when the FYMON of record checks into the voice net and the FYMON will assume the duties as above. If no FYMON checks into the voice net, the NCS will continue until net closing.   It will then be the duty of the NCS to get the off-frequency station on frequency.

4.2.4.   The NCS will have the final authority on all frequency corrections and will use the FYMON only as an advisor. If a station fails to get his/her station on frequency or eliminate distortion problems, the NCS may choose to close that station until he/she eliminates the problem.

4.2.5.   The FYMON may occasionally act as a procedure monitor and give the NCS or other official information that can be used to correct the offending station. No procedure corrections are to be made on the air. Phone, Email or letter must make all such corrections to the offending station. Minor procedure errors should not be considered for reporting.

4.3.   DIGITAL NET PROCEDURES. Digital nets have essentially the same requirements for FYMON use as the voice nets except some procedures are different. The digital nets will have a FYMON station set a tone in the digital format used for all stations to tune to. The procedure will vary with different modes.

4.3.1.   The digital nets will normally open with a tone signal set by the FYMON. The FYMON will usually send a short test message for all stations to tune to. The FYMON will continue to monitor all stations for frequency aberrations and, when found, attempt to place them back on the correct frequency. Normally certain digital stations that are off frequency will not be able to copy the net and will automatically return to the correct frequency.

4.3.2.   Packet nets will normally send a beacon signal with identifying callsign when not participating in net activities. This beacon can be used to tune to a station. A FYMON will periodically check packet stations to insure correct frequency tolerances.

4.3.3.   BBS stations will be checked by a FYMON periodically when problems occur.

4.3.4.   Other digital modes will require special consideration to insure frequency accuracy. These modes will sometimes require special equipment and will not be covered here. More detailed information on frequency adjustment for these modes will be covered in another section of this manual.

4.3.5.   Every attempt should be made by the Chief FYMON to have a FYMON present on all digital nets.

Section V

PHONE PATCH MANUAL

OPERATIONS AND PROCEDURES

John B McGee — AFN2AC
National Phone Patch Manager

1 March 2006

Contents

PHONE PATCH NETWORK PROCEDURES

5-1. Purpose. To establish standardized procedures for MARS phone patch networks.

5-2. General Information. Procedures for USAF MARS phone patching have become relatively standard over the years. All phone patch net operators will be familiar with the procedures outlined in this manual and use them in all phone patch operations. MARS phone patch nets are closed nets.

5-3. Responsibilities.

   5-3.1. USAF MARS. USAF MARS is responsible for efficient operation of the MARS phone patch network. To accomplish this task, it will:

      5-3.1.1. Initiate AF MARS Form 3661 appointing affiliate phone patch net manager.

      5-3.1.2. Make frequency assignments.

      5-3.1.3. Periodically update and distribute copies of the network structure and assigned frequency lists to all users.

   5-3.2. MARS Phone Patch Special Network Manager (SNM). The SNM will:

      5-3.2.1. Coordinate with State MARS Directors (SMD) and USAF MARS for the assignment of affiliate stations to the phone patch network.

      5-3.2.2. Ensure stations have the required capabilities prior to assignment to the phone patch net.

      5-3.2.3. Direct phone patch net operations, exercising NCS duties and responsibilities.

      5-3.2.4. Control the use of assigned phone patch frequencies by designating the primary and secondary frequencies.

      5-3.2.5. Ensure proper operating procedures, circuit discipline, and system integrity are maintained.

      5-3.2.6. Maintain records of affiliate station participation, and report this time quarterly to their respective MARS ROAM.

   5-3.3. Phone Patch Network Station. A phone patch network station will:

      5-3.3.1. Maintain contact with the NCS during their station's operating times.

      5-3.3.2. Participate in network operations as required.

      5-3.3.3. Conduct all communications IAW current directives.

      5-3.3.4. Comply with instructions issued by the NCS

5-4.   Assignments. MARS phone patch networks is a closed net with the exception of those affiliates assigned on AF MARS Form 3661. The phone patch net is open to all military MARS stations. Affiliate assignment to this network will be made by the SNM in response to an affiliate's phone patch net application from their SMD. For affiliates meting net prerequisites, the member's SMD then coordinate the member's acceptance to the net with the phone patch SNM. The member, or the SNM may terminate net membership for cause. Failure to participate is cause for net membership termination.

5-5.   Station Requirements. There are special requirements that each affiliate station must meet prior to being assigned to a phone patch network. Specifically, these stations will:

  5-5.1.   Be capable of operating on assigned network frequencies.

  5-5.2.   Have RF output power and antennas capable of phone patch operations. Normally a one-kilowatt amplifier and a directional antenna are required. Mini-beams do not qualify.

  5-5.3.   An on the air phone patch test is required that must result in a quality voice signal with no distortion or hum.

  5-5.4.   Be willing to dedicate time in excess of the minimum MARS activity requirement.

5-6.   Phone Patch Procedures.

  5-6.1.   General. Phone patch network operating hours and frequencies are established with coordination/approval through USAF MARS and FHA. Changes to times or frequencies will be disseminated through the MARS broadcast, and by notifying the affected net. Phone patch nets use frequencies that propagate on an international scale. Consequently, MARS operations on these frequencies must be conducted in a highly professional manner so USAF MARS is reflected upon favorably. Because of the long distance nature of the frequencies assigned to the phone patch net, communications between stations will vary depending upon the time of day/month/year, and station location. Therefore, it is not always possible for all stateside stations to be in direct contact with one another. Frequent use of relays will be required to coordinate traffic passing on phone patch nets. Networks will not change between assigned frequencies for the sole purpose of enhancing contact among stateside stations, but will choose the frequency best suited for overseas phone patch operations.

  5-6.2.   Checking Into and Out of Nets. IAW standard USAF MARS operating procedures, checking into or out of a net will be accomplished only when the circuit is free of traffic being passed. Use of the proword "BREAK" is not authorized. The station checking in/out will call the NCS. If the NCS does not respond, stations already checked into the net will relay the request at the next possible time.

  5-6.3.   Traffic Distribution. To the greatest extent possible phone patches will be rotated among stations that are operating on the net. Maximum participation by all net members is desired to enhance training and their ability to respond in times of emergency. To this end, all stations should have equal access in handling the available traffic.

5-6.4.   Participation Reporting. Phone patch net participation will be reported quarterly. It is each net member's responsibility to make sure his or her participation time is received by the SNM before the end of the quarter. The net manager will consolidate these reports and send them to the respective ROAM. Using MARS messages is encouraged to meet the participation-reporting requirement.

5-7.   MARS Phone Patch Procedures. The USAF MARS operator on each end of the circuit is responsible for proper operation of the phone patch. Specific procedures are as follows:

5-7.1.   Calling Methods. Most phone patches are made by reversing the charges (i.e. collect). Occasionally the calling party may request billing to a third party or credit card. While these are allowed, operators are, cautioned to maintain an accurate log. A log will assist in answering any questions that may arise about payment of long distance charges. Often a third party (US Sprint, MCI, etc.) will prepay for phone patches during selected holiday periods. The SNM will provide necessary information for this service to his/her net members. Telephone access info from the SNM must be treated as close-hold (non-releasable) information, since illegal or unauthorized use of it could result in the loss of this free service. The bottom line is: *While USAF MARS provides 'free' morale and welfare calls, this "free" service refers to the part of the call that is transmitted over the radio. At no time will the cost of a morale and welfare phone (non-transmitted) call be charged to MARS or to the government.*

5-7.2.   Called Party Instructions. Instruction on phone patch procedures is usually required before the patch can be initiated. The called party will be advised in the use of the proword "OVER" and the circuit's unclassified status. Unless specified by the SNM or NCS, operators should brief the calling and called parties that the circuit is not secure and not to discuss items of a highly personal or classified nature. They should be told that only one person can talk at a time, and that the phone patch will be limited in time. They should also be instructed not to discuss geographical locations.

5-7.3.   Proword And Abbreviation Usage. Only prowords and abbreviations authorized for USAF MARS may be used. Those developed in other services/systems (e.g. Citizens Band, Amateur Radio Relay League (ARRL), etc.), and modes such as CW or RTTY, ***are not authorized***. When approved prowords do not exist to express an action/function, plain English will be used (e.g. "no answer" is acceptable, while "DNA" is not).

5-7.4.   Time Limit. "Morale" phone patches are normally limited to five minutes. Operators may extend this time limit, depending on circuit traffic load and/or importance of the call. Responsibility for enforcing the time limit rests with the initiating station. There is no time limit imposed for official calls.

5-7.5.   Phone Patch Protocol. A phone patch usually follows the sequence given below. Slight deviations may occur depending on the specific circumstances of the patch.

5-7.5.1. The initiating station will list the patch with the NCS. Several patches may be listed at one time to expedite operations.

5-7.5.2. When it is the initiating station's turn, the NCS will advise the initiator to conduct their patch(es) with the other station.

> NOTE: The NCS will process phone patch traffic on a basis of precedence (i.e. Immediate, Priority, Routine). Messages of the same precedence will be processed on a first-in, first-out basis (this depends on availability of other net member stations also).

5-7.5.3. The initiating station will call the receiving station and conduct a signal check. If patch quality exists in both directions, the patch will be conducted

5-7.5.4. Completion of the patch will be reported to the NCS.

5-7.6. Phone Patch Log. Affiliate stations will log all phone patch operations. In addition to other MARS logging requirements, the phone patch log will contain the following information:

5-7.6.1. Station call sign.

5-7.6.2. Name of person for whom the patch was performed.

5-7.6.3. Phone number called, and phone number/credit card number of the caller (if billing will be to other than the number called).

5-7.6.4. Specific information about the patch (e.g. completed, refused, etc.).

5-7.6.5. Time, date, and frequency of the patch

5-7.6.6. Any additional data as determined by the NCS.

5-8.   Classified Information. Discussion of classified information during a MARS phone patch is not authorized. MARS operators are not expected to determine the classified nature of phone patch conversations and will not terminate patches when suspected violations occur. They should bring the information to the attention of the NCS. To preclude occurrences of this nature, the initiating and receiving parties will be briefed on the insecurity of USAF MARS phone patch circuits prior to the patch being initiated.

1 Attachment
A5-1 Sample Phone Patch Dialogue

USAF MOI Attachment 5-1

Sample Phone Patch Dialogue

A typical MARS phone patch dialogue might be as follows:

AGA#DB - "AIR this is AGA#DB, I have three patches to list, Over."

AGA#DB This is AIR. Roger, Out."

(Later on)

AIR – AGA#DB this is AIR. List two phone patches with AFA#XX, Out."

AGA#DB "AFA#YZ This is AGA#DB. Radio check, over"
AFA#YZ "AGA#DB This is AFA#YZ. Loud and clear, ready to copy, over"

AGA#DB "Patch number one is from Don, I spell DELTA OSCAR NOVEMBER Don James, I spell JULIETT ALPHA MIKE ECHO SIERRA, James going to the state of Kentucky, phone figures THREE FIVE SEVEN Hyphen FOUR NINE THREE Hyphen TWO TWO SEVEN EIGHT. Patch number two is (and so on), Over."

AFA#YZ "Roger, Wait."

AFA#YZ "AGA#DB This is AFA#YZ. I have Dan's brother on the line. Have Don initiate, over."

AGA#DB - (Don speaking) "Hi Robert. Have you got the house yet, over."?

AFA#YZ - (Robert James speaking) "Hi Don. I'll have it soon, over."

(And so on)

AFA#YZ - "AGA#DB This is AFA#YZ. Patch complete Over."

AFA#YZ - "This is AGA#DB, Roger Out."

(After the second patch is completed)

AGA#DB - "AIR this is AGA#DB. Two patches complete with AFA#YZ, over."

"This is AIR. Roger Out."

Section VI

DIGITAL OPERATIONS AND TRAINING GUIDE

1 March 2006

US Air Force MARS

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CONTENTS

Introduction

6-1.   Historical Background.

6-1.1.   Reliability, security and speed are the three fundamentals of military communications, with reliability ultimately the most important. Reliability must never be diminished or sacrificed to meet the conflicting demands of security, speed, or convenience. Modern digital communications provide a means of enhancing both the reliability and speed of communications within MARS.

6-1.2.   There are some who claim that the first radio communications using Morse code or continuous wave (CW) were digital communications. CW communications were the major method of communications in both the military and the Army Auxiliary Radio System (AARS), the precursor to MARS, up to World War II. CW communications provided a nominal 25 words per minute (wpm) speed. High-speed nets operated up to 40 wpm; reliability was determined by operator fatigue.

6-1.3.   During WWII, radio teletype digital communications using the 5-level Baudot code, identified as "RATT" in military terms and later "RTTY" in the amateur world came into common use. This new mode provided 60 and 100 wpm communications speed, but did not provide for any error detection or correction. Operators learned to correct for garble when the Letters shift or Numbers shift character was missed during transmission. Experienced operators could correct single character errors from context and knowledge of single bit errors. The use of punched paper tape prior to transmission offered an opportunity to correct typing errors and enhance reliability in message relay.

6-1.4.   By 1950, the academic engineers had developed communications theory to the point that error correction and detection methods were theoretically possible but were not yet practical. An early attempt to put the new theories into practice was the British Piccolo system that used multiple tones and required a bank of mechanically resonant vibrating reeds in the receiver

6-1.5.   The development of the microprocessor made the modern amateur digital communications systems technically possible; the relaxation of FCC rules that inhibited the use of other than Baudot code in the amateur bands gave amateurs the go ahead to explore these exciting new possibilities. Radio teletype demodulators that were used to drive mechanical teleprinters were now connected instead to the new home computers of the 1980's. This was followed by the development of packet radio when radio amateurs in Canada developed a system for transmitting data over radio known as the Vancouver protocol. When USA amateurs were permitted to use other than the Baudot code over the air, a group known as Tucson Amateur Packet Radio (TAPR) developed an enhancement of the Vancouver protocol using the international x.25 protocol developed for landline packet switching, naming it AX.25. With this development, error correcting digital transmission was made available to amateur operators and MARS members.

6-1.6.   Packet radio required a hardware device know as a Terminal Node Controller (TNC) or Data Controllers to interface the radio and the user's computer. Digital signal processing was carried out in the TNC and soon other digital modes were added to the capability of these TNCs.

As new modes such as AMTOR and PACTOR were introduced, some manufacturers called their units Multi-Mode Controller (MMC). The generic nickname of TNC is still the most commonly used acronym to describe these interface units. AMTOR and PACTOR introduced Forward Error Correction (FEC) and Automatic Repeat Request (ARQ) error correction for Packet radio. FEC enhances the reception of broadcast traffic by automatically correcting errors. Similarly capable sophisticated proprietary modes such as G-TOR and CLOVER also appeared at this time.

6-1.7. The development of digital radio modes leveled off during the 1980's while home computer technology continued to grow. In the decade of the 90's, some amateur operators realized that the peripheral sound cards in home computers were powerful devices containing a digital to analog converter, an analog to digital converter and a sophisticated digital signal processor. Fortunately, the computer code to control these sound cards was in the open and the sound card digital mode revolution began. PSK31, developed by Peter Martinez (G3PLX), was the first of these modes to achieve popularity. This was followed by many new modes such as QPSK-31, MFSK-16 and MT63. In addition, older modes such at RATT, ASCII, and AMTOR were implemented in sound cards. This eliminated the need for expensive modulators/demodulators (modems) and TNCs except for PACTOR transmission because of licensing issues. As of mid-2005, amateur and MARS operators must have a dedicated TNC/MMC in order to transmit and receive PACTOR; some of the sound card programs include a receive only PACTOR level I capability.

6-1.8. As we enter the 21st century, systems such as Winlink 2000 are providing a seamless interconnection between digital radio and the Internet. These developments have opened digital operations to persons who do not have the skills required for earlier digital radio operations.

6-2.   Training. Air force MARS members need three skills to become an accomplished digital communications operator: These skills are (1) knowledge of digital net procedures, (2) knowledge of hardware operation and (3) knowledge of software operation. Skill (1) is the subject of this document. Skills (2) and (3) are beyond the scope of this document. They are best acquired through experience by participation in digital training nets and by working with mentors. The information required to acquire the hardware and software skills can also be found in the user manuals that come with the hardware and software.

6-3.   Guide Organization. This guide consists of four chapters and a number of amplifying appendices. Chapter 2 is covers network operations conducted in a digital mode only. Chapter 3 is concerned with mixed-mode network operations where basic net operations are conducted using voice, but where traffic is passed using digital operations. Chapter 4 is concerned with operations involving MARS TRANSCON Message Center Systems (BBS) and stand alone-mail boxes (PBBS). The appendices cover procedural signals, an overview of digital modes in use in MARS, digital hardware and interconnection, and of digital communications software.

6-4.   Digital Net Operations (Keyboard)

6-4.1.   General. Digital nets are primarily operated in a "broadcast" mode so that all net members can copy the information sent. Network operations should be conducted using Sound Card or PACTOR using Forward Error Correction (FEC) mode. In the examples that follow, the "transmitted information" is shown in uppercase; explanations of procedural signals are shown in lowercase and are enclosed in parentheses.

6-4.2.   Digital Net Operations. MARS digital net operations are basically derived from the USAF MARS Morse code and RTTY net procedures that are no longer used in MARS. They are similar to voice net procedures and should be familiar to MARS members. One significant difference is that prosigns and the Q and Z procedural signals replace the prowords used in voice nets.

   6-4.2.1.   Q- and Z-signals. A word of caution is in order concerning Q and Z-signals as there are many more of these signals than are required for MARS operations with some considered obsolete. Others are concerned with highly specialized operations. It is suggested that MARS member confine the use of Q and Z-signals to those found in Attachment A of this document. Recommended additions that may enhance digital network operations should be made through the member's Region level training staff. Usage of Q and Z signals may vary between services therefore in the interest of interoperability members should be familiar with those used by both USAF, Army and Navy MARS.

   6-4.2.2.   Procedures. Some of the radio teletype (RATT) procedures were developed to overcome the limitations of the old mechanical teleprinters, including the continuous paper output of these machines. Some of these can be dropped here in the 21st century without sacrificing reliability and with some increase in speed. Specifically, sending of double carriage returns (CR) prior to sending a linefeed (LF) and sending extra LF characters is neither required nor can it easily be done with modern keyboards. Current on-air experience tells us that beginning each transmission with five spaces and one ENTER key allows the software to synchronize better with the transmitted signal. Military record communications text continues to be transmitted in upper case characters only and until there is a change to that procedure, USAF MARS message text will continue to be formatted accordingly.

   6-4.2.3.   Use of a 7-character MARS callsign. Most terminal node controllers (TNCs) will not allow you to use an Army or Navy/Marine Corps 7-character MARS callsign such as AAA9USA. Unfortunately, some software will permit entry of a seven-character callsign, but the actual callsign is truncated into the software stored text buffer as six characters so AAA3USA may becomes AAA3US. Most TNC manufacturers use a data element field that is designed to only accept a properly configured amateur radio callsign. For example, trying to connect to the Army Western Area Gateway using their full voice callsign (AAA9USA) will cause you considerable frustration. To overcome this obstacle, Army has adopted the Routing Indicator (RI) that drops the leading character or trailing character of the callsign prefix of their assigned callsign for digital operations so that AAA9USA becomes digital routing indicator AA9USA while AEM1USA becomes AE1USA. Navy/Marine has incorporated a similar procedure by dropping an "N" in their call so that in digital operation NNN0ASA becomes NN0ASA.

      6-4.2.4.   Net Opening. The Net Control Station (NCS) opens the net at the scheduled time by transmitting a general net call and a tuning signal. This tuning can be the traditional "RYRYRY" sequence or any other line of about 60 characters. The RY sequence was significance with the old RATT Baudot code where it produced an alternating mark and space sequence but with modern codes and equipment any pattern can be use such as **"THE QUICK BROWN FOX JUMPS OVER THE LAZY DOG'S BACK 01234567890"**.

      Example: NCS transmits.

      TRR TRR DE AFA#JN
      ZRF (I will send a tuning signal)
      ZRC1 (Tune your transmitter to the proper frequency)
      THE QUICK BROWN FOX JUMPS OVER THE LAZY DOG'S BACK
      01234567890
      AR (Out)

      After one minute, during which stations may adjust equipment, the NCS invites stations to check into the net by transmitting:

      TRR TRR DE AFA#JN

      INT ZKE INT ZBO (Does any station wish to check into the net?
      K (Over) The NCS may also ask check-ins for a signal report
      Using QRK Readability.

      6-4.2.5.   Initial Net Check-in. Stations check into the net as follows:

      DE AFA#QG GA QRU K (No traffic; I have nothing for you)

      DE AFA#BA FL ZBO 1 M VA HOSPITAL NE PACTOR K (I have traffic; 1 MARSGRAM for VA HOSPITAL NE USING PACTOR)

      DE AFA#CZ WI ZBO 1 R AFA#QG MT-63 K (I have traffic 1 routine for AFA#QG using MT-63)

      DE AFA#PQ NE QRU K

      DE AFA#LB AR QRU INT QSO AFA#QG K (No traffic, request informal contact with AFA#QG)

      The NCS acknowledges stations checking into the net.

      TRR TRR DE AFA#JN
      R AFA#QG GA
      AFA#BA FL 1M
      AFA#CZ WI 1R
      AFA#PQ NE

AFA#LB AR QSO AFA#QG
INT ZOD (Is there any relay of additional stations not heard by NCS?) K

      6-4.2.6.   Message handling. The NCS directs the passing of traffic in order of precedence AFA#CZ DE AFA#JN ZOG 1R AFA#QG AR (Send your message to AFA#QG Out)

AFA#QG AFA#QG DE AFA#CZ   K

The receiving station responds indicating he is ready to accept traffic

AFA#CZ DE AFA#QG QRK 5 QRV K (I am reading you good and ready to copy, Over)

The transmitting station then sends the traffic. If a non-error correcting or FEC mode is used, one or two seconds of idle should be sent to allow the receiving station to achieve synchronization.

(Idle or "diddle" transmission)

AFA#QG DE AFA#CZ NR 12
R 12143Z DEC 2005
FM AFA#CZ WI
TO AFA#QG GA
BT

(Message text)

BT
NNNN (End of message)
K

The receiving station receipts for the message

AFA#CZ DE AFA#QG R NR 12 AR

The NCS directs passing of the next piece of traffic

AFA#LB DE AFA#JN ZOG AFA#PQ AR

AFA#LB calls AFA#PQ
AFA#PQ AFA#PQ DE AFA#LB INT QRK K

If the receiving station feels that conditions warrant the use of an ARQ mode, he should send:

AFA#LB DE AFA#PQ QRK 5 QRV PACTOR ARQ K (I am ready for PACTOR ARQ)

The sending station initiates an ARQ connect and sends the traffic as soon as his software shows that a link has been made. No idle is required in this case as the two stations are already in synch. When the message has been passed, the sending station issues an ARQ change over command and the traffic receiving station receipts for the message.

DE AFA#PQ R NR 17 AR and then disconnects the link.

Since ARQ transmissions are difficult to monitor, the sending station informs the NCS that the traffic has been successfully passed by transmitting in the FEC mode of the net.

DE AFA#LB QRU AR

6-4.2.7.   MARS Business or Bulletins. The NCS queries the net for official MARS business or bulletins.

TRR TRR DE AFA#JN INT MARS BUSINESS OR BULLETINS K

Any Chief USAF MARS, ECOM or TRANSCON bulletins are normally transmitted to the net using FEC mode.

6-4.2.8.   Net Training. Digital net training can take the form of practice message passing or training lessons on topics specific to digital communications. These lessons can be prepared ahead of time and transmitted from a file just as a bulletin is broadcast. The National Training Manager, AFN2TD, or within a Region the Region Training Manager, AFF#T, have access to basic digital communications lesson plans.

A typical digital net training session might be transmitted as follows

3S1 3S1 DE AFA#VP NET INFORMAL

TODAY'S TRAINING IS ON THE USED OF THE Z-SIGNAL ZEN

USE OF ZEN AND ZXX

WHEN ZEN IS PLACED BEFORE AN ADDRESSEE, IT MEANS THAT THE MESSAGE HAS BEEN SENT TO THAT PARTICULAR INDIVIDUAL BY OTHER MEANS AND FORWARDING OR RELAYING THE MESSAGE TO THAT ADDRESSEE IS NOT REQUIRED.

AS AN EXAMPLE, FOR AN EEI REPORT, THERE ARE MULTIPLE ADDRESSEES. THE TO LINE CONTAINS THE ACTION ADDRESSEE AND THE INFO LINES CONTAIN ADDITIONAL ADDRESSEES. AS THE MESSAGE IS BEING RELAYED THROUGH THE MARS RADIO SYSTEM, THERE IS A NEED TO IDENTIFY THE RECEIVING STATION IF THE INDIVIDUAL ADDRESSEE(S) HAS BEEN TAKEN CARE OF OR IF THE MESSAGE NEEDS TO BE RELAYED TO THEM AS WELL.

AN EXAMPLE OF THE ADDRESS LINES OF AN ACTUAL INCIDENT EEI:

DE AFA#VP NR 37
P 141400Z DEC 2005
FM STEINEL / AFA#VP KS
TO JDOMS@AA#USA
INFO AGA3C IL
AFF#E MO
ZEN AFF#KS KS
ZEN AFN1EC ME
BT

IN CASES WHERE A LARGE NUMBER OF THE INFO ADDRESSEES
HAVE BEEN HANDLED BY OTHER MEANS THE Z SIGNAL ZXX CAN BE
USED WHICH MEANS THIS MESSAGE HAS BEEN DELIVERED TO ALL
INFORMATION ADDRESSEES WHOSE CALLSIGNS FOLLOW THIS
OPERATING SIGNAL. FOR INSTANCE, IF ALL THE INFO STATIONS
HAD RECEIVED THE ABOVE EEI VIA E-MAIL, THEN WE COULD USE
ZXX INSTEAD OF PUTTING ZEN BEFORE EACH:

DE AFA#VP NR 37
P 141400Z DEC 2005
FM STEINEL / AFA#VP KS
TO JDOMS@AA#USA
INFO ZXX AFN1EC ME
AGA3C IL
AFF#E MO
AFF#KS KS
BT

WHEN USING E-MAIL, YOU CAN DETERMINE BY THE E-MAIL TO LINE
AND/OR THE CC LINE WHAT ADDRESSEES WERE INCLUDED AND
HAVE BEEN SENT THE MESSAGE DIRECTLY. IN OTHER WORDS,
WHEN USING E-MAIL, A RELAY OF THE MESSAGE IS USUALLY NOT
REQUIRED AND THEREFORE THERE IS NO NEED TO USE THE
PROSIGN ZEN.

DOES ANY STATION HAVE COMMENTS OR QUESTIONS? ..... K

6-4.2.9.   Net Member Informal Comments. If time permits once all traffic has been
cleared, official MARS business concluded, and training conducted, the NCS may place the net
in the informal mode and call each net member to solicit informal comments. The net is still a
directed net but operated on an informal basis.

3S1 3S1 DE AFA#VP NET INFORMAL AR

AFA#RT DE AFA#VP GM TOM K

AFA#VP DE AFA#RT GM CONNIE ES NET. ENJOYED THE TRAINING. WX HERE IS NICE AND SUNNY. LOOK FORWARD TO ADMIN NET THIS EVENING. K

Etc., etc.

6-4.2.10.   Net closing. The NCS may make any informal closing remarks and then close the net at the designated time by transmitting:

3S1 3S1 DE AFA#VP

ZKJ2 (the net is closed) ZKJ1 (I am closing station) AR

6-5.   Mixed Mode Net Operations (Used in conjunction with voice nets)

6-5.1. **Definition.** A mixed mode net is one in which normal net operations are conducted using radiotelephone and where some or all traffic is passed using a digital mode. Members checking into a mixed mode net with traffic should indicate the preferred mode of digital transmission at that time. Members, who are capable of receiving digital traffic, should be prepared to receive traffic by having their computers and other equipment ready and announcing that they have digital capabilities when checking in.

6-5.2. Operations.

6-5.2.1.   Initial Check-in. A typical sequence during the net opening might go like this:

THIS IS AFA#YX WISCONSIN NO TRAFFIC, HAVE PACTOR OVER

THIS IS AFA#AN MISSOURI 1 ROUTINE AFA#YX PACTOR ARQ OVER

In this example AFA#AN lists traffic and indicates that he is prepared to send using the PACTOR ARQ mode.

6-5.2.2.   Moving Traffic using an ARQ Mode. After acknowledging initial station check-ins using voice mode, the NCS directs traffic relay.

AFA#AN THIS IS AFA#VP CALL AFA#YX AND SEND YOUR 1 ROUTINE, OUT

AFA#AN responds by voice:

AFA#YX DE AFA#AN HOW COPY OVER

AFA#YX responds by voice:

THIS IS AFA#YX YOUR GOOD READABLE PACTOR READY, OVER

At this point AFA#AN would initiate a PACTOR Connect command with AFA#YX and immediately send the traffic when his software indicates that a link has been established.

DE AFA#AN NR 03
R 121806Z DEC 2005
FM AFA#AN MO
TO AFA#YX WI
BT

(Message Body)

BT
NNNN

There are 5 carriage returns inserted between the final "BT" and the four-letter end-of message indicator "NNNN".

AFA#AN now sends a change over command so that the receiving station, AFA#YX, becomes the sending station. AFA#YX then receipts for the message

DE AFA#YX R NR 03 AR

AFA#YX then issues a link disconnect command. Upon receipt of the link disconnect, AFA#AN announces by voice.

THIS IS AFA#AN TRAFFIC COMPLETE, OUT

This last procedure is for the benefit of the NCS and other stations without digital monitoring capabilities to know that this net operation had been completed and the next operation or additional station check-ins can proceed.

6-5.2.3.   Requesting Fills with an ARQ Mode. Normally fills are not required with an ARQ mode as errors are corrected automatically by retransmission of bad packets. Operator error may cause the first line or two to be lost because receiving station neglected to open a buffer or file for saving the traffic. In any case, the receiving operator will request fills at the time that the link is turned over to him after transmission of the message:

DE AFA#YX AB FM AFA#AN K (And, issues a changeover command() The sending station responds)

DE AFA#AN AB FM AFA#AN
DE AFA#AN NR 03
R 121806Z DEC 2005
K

The receiving station then receipts for the message

DE AFA#YX R NR 03 AR (And, then issues a link disconnect command.)

   6-5.2.4.   **Moving Traffic using an FEC Mode**. The procedure differs slightly from
ARQ mode transmission because of synchronization delays. A few seconds of idle or null
transmissions should precede the sending of the message. The process begins with the NCS
directing the sending of the traffic:

   AFA#AN THIS IS AFA#VP SEND 1 ROUTINE TO AFA#YX, OUT

   AFA#AN calls AFA#YX and asks for a signal report by voice.
   AFA#YX THIS AFA#AN HOW DO YOU READ OVER

   AFA#YX responds by voice:

   THIS IS AFA#YX YOUR LOUD AND CLEAR, MFSK16 READY, OVER

   At this point AFA#AN would initiate an MFSK16 transmission but wait a few
   seconds or send five spaces and one ENTER key for the receiving station's
   equipment to establish synchronization. After this short delay, AFA#AN would send
   the traffic from a text file or transmit buffer.

   DE AFA#AN NR 03
   R 121806Z DEC 2005
   FM AFA#AN

   (Rest of message)

   BT
   NNNN

   AFA#AN now un-keys his transmitter and the receiving station receipts for the
   message by voice:

   THIS IS AFA#YX ROGER NUMBER 03 OUT

   The NCS then continues the net operation.

   6-5.2.5.   Requesting Fills with an FEC Mode. The newer sound card modes, such as
MT-63, have very robust FEC algorithms and will seldom require repetitions for fills. AMTOR
and PACTOR FEC transmission will on occasion require fills, but much less frequently than the
Baudot RATT and PSK-31 modes. Fills should be requested by voice in a mixed mode net and
sent by voice if only one or two groups are needed. Otherwise, all or part of the message can be
sent again. For example, at the end of the initial transmission, the receiving station requests a fill
by voice:

   THIS IS AFA#YX SAY AGAIN WORD AFTER BUILD, OVER

   The sending station replies:

THIS IS AFA#AN I SAY AGAIN WORD AFTER BUILD IS FIGURES 1.08,

OVER

The receiving station then receipts for the message:

THIS IS AFA#YX ROGER NUMBER 03 OUT

If major portions of the text are corrupted, the receiving station may request a retransmission of all or part of the message. As a practical matter, retransmission of the entire message may be more expedient rather than wait for the sending station to edit the text for retransmission. For example:

THIS IS AFA#YX SAY AGAIN ALL BEFORE BREAK OVER

Here the receiving station is indicating that he needs multiple fills in the header of the message and the send stations responds.

THIS IS AFA#AN, RETRANSMISSION FOLLOWS WAIT.

The sending station resends all or the message or just the header, using the FEC mode. The receiving station responds by voice:

THIS IS AFA#YX ROGER NUMBER 03 OUT

6-6.   PBBS and BBS Mailbox Operations

   6-6.1.   Introduction. TNC Mailboxes (PBBS) Personal Bulletin Board Systems (PBBS) provide a means of sending and receiving MARS messages and bulletins outside of scheduled net time. A TNC Mailbox function is part of the firmware within the TNC. A BBS system requires both a TNC and a personal computer but provides enhanced capabilities over the simpler TNC Mailbox. Personal electronic mailboxes, PBBS (non-disk based mailboxes) are not to be used in the USAF MARS Digital System for traffic requiring further radio communications relay. This feature is only to be used for receiving messages that do not need to go further electronically.

   6-6.2.   TNC PBBS Mailbox Operations. This section will use the Kantronics KAM and KPC3 mailbox protocols as examples as they are perhaps the most widely used. Both Timewave/AEA and MFJ TNCs have mailbox modes and the basic command structure is similar for all three. Refer to your equipment manual to identify any differences in command syntax. Internal mail boxes generally will not forward messages, they must be retrieved and relayed manually. Some mailboxes can provide limited forwarding but only to a single BBS normally identified as the HOME BBS.

       6-6.2.1.   TNC Connections. The user connects to the TNC Mailbox using either Packet on VHF or PACTOR ARQ on HF. When connected, the TNC Mailbox will send a sign-on message and issue a command prompt ">" which indicates it is now ready to receive commands. It is important that the user read the screen and respond to the prompts. These devices are fairly

bullet proof and will respond to most operator errors with a humorous digital request for repetition:

>EH? or INVALID COMMAND

6-6.2.2.   Mailbox (PBBS) Commands. Table 6-1 is a list of Kantronics PBBS commands. A full list can be obtained at any time by typing H <enter> in response to the command prompt.

Table 6-1	Kantronics KAM Mailbox Commands
Command	Function
B(ye)	PBBS WILL DISCONNECT
J(heard)	CALLSIGNS WITH DAYSTAMP
J S(hort)	HEARD CALLSIGNS ONLY
J L(ong)	CALLSIGNS WITH DAYSTAMP AND VIAS
L [x [y]] [;]	LIST MESSAGES x THRU y YOU CAN READ
L <|> call	LIST MESSAGES FROM OR TO CALL
LB	LIST BULLETINS
LC [cat]	LIST CATEGORIES
LL n	LIST LAST n MESSAGES
LM(ine)	LIST UNREAD MESSAGES ADDRESSED TO YOU
LO [+|-]	LISTING ORDER
	LT LIST TRAFFIC
LTn	DISPLAY LOCATION TEXT n=1-4
K (ill) n	DELETE MESSAGE NUMBER n
KM (ine)	DELETE ALL READ MESSAGES ADDDRESSED TO YOU
R (ead)N	DISPLAY MESSAGE NUMBER n
RH n	DISPLAY MESSAGE n WITH HEADERS
RM (ine)	READ ALL MESSAGES ADDRESSED TO YOU
S(end) call	SEND MESSAGE TO callsign
S[B|P|T] call	SEND BULLETIN, PRIVATE, or TRAFFIC

6-6.2.3.   Listing and receiving messages: To obtain a list of the messages stored on the PBBS, type the command:

L <enter>

6-6.2.4.   Reading Messages. To read a specific message, type the command:

R # - where the symbol "#" is the message number in the list shown above.

After you have received a message addressed to you by the callsign you used to connect with the PBBS, remove it from the PBBS by typing the command:

K #

e. Sending messages. Before sending a message, it is suggested that the message be prepared and stored in a file or in your terminal software transmit buffers. Start sending a message by typing the command:

ST <callsign> - where <callsign> is the callsign of the recipient of the message. The PBBS will then respond with the prompt:

Subj:

Type a short one line subject of the message that will appear in the traffic listing. Examples are:

Example 1 NET REPORT
Example 2 NET CONTROL ASSIGNMENT
Example 3 MARS EXERCISE

The PBBS will then respond

Msg:

Start typing the text or send it from the transmitted buffer or file. At this point the PBBS is in a single purpose mode, it will accept anything your type or send, including PBBS commands, as message text until it receives either of two END OF MESSAGE (EOM) indicators. These EOM indicators must be typed on a line by themselves and followed by a carriage return or ENTER keys. The EOM indicators are **"/EX"** or, "<control>**z**" (Press control shift key while pressing the letter "z")

Upon receipt of the EOM indicator, the MBO will respond

MESSAGE SAVED.

Do not use the shorthand command S <callsign> as it is interpreted in different ways by different MBOs. In the case of the Kantronics PBBS, it is processed as SP (Sent Private) command and only the sender, the recipient or the PBBS system operator, can read the message. In other systems, it is processed as ST (Send Traffic) command and can be read and relayed by all the BBS users. <u>ST is the preferred command for most traffic in the MARS network</u>.

6-6.3. Keyboard Short Cuts. As the MARS operator gains experience with BBS operations, he may wish to use the following short cut commands:

LM -(List Mine) list all traffic addressed to me

RM -(Read Mine) will read all traffic addressed to me. All the messages will be sent continuously and without a pause between messages.

KM -(Kill Mine) will kill all messages addressed to me. This command should be used with caution as you may have not read all of your messages and then you will not be able to recall them.

6-6.4.   TRANSCON FULL SERVICE BBS Operations.

6-6.4.1.   General. Winlink and MSYS are the two programs being used at this time for full service scanning and fixed frequency TRANSCON BBS systems.

6-6.4.2.   PACTOR III. The older MSYS DOS-based software is no longer supported by its author but is still being used. Winlink takes advantage of Microsoft Windows environment and will operate Pactor I, II or III.

6-6.4.3.   BBS Advantages. The BBS computer provides nonvolatile storage of messages on the computer hard drive. When properly configured, a deleted message may be retained in the hard disk archives. It can forward messages on a regular schedule to other systems using forwarding tables that can provide alternate routing in the event of distant BBS outage or lack of propagation. Table 6-2 is a list of Winlink commands. You will notice that this is just an expanded list of the commands used with a PBBS. However, the user familiar with just a smaller list of simple PBBS commands will still be able to use the BBS effectively.

Table 6-2		Winlink Classic Commands
CMD	ALIAS	FUNCTION
A	ABORT	Stop Sending
B	BYE	Log off from Winlink
C #	CANCEL	Delete my message number #
D #	DELETE	Delete my message number #
E	EXPERT	Expert Mode (ON/0FF)
H	HELP	Read the Main Help file
K #	KILL #	Delete my message number #
I	INFO	Read the Information File for this mode
L	LIST	List all my Private and NTS messages
LM		List all my Private and NTS messages
LB		List new Bulletins since last inquire
LB #		List Bulletins starting with Bul #
LLB # (loc)		List last # Bulletins filed, beginning at "loc"
LL		List new Messages since your last inquiry
LL # (loc)		List last # messages filed, beginning at "loc"
LM		List all my PRIVATE and NTS messages
LN		List all my unread messages
LR		List users in last 24 hours
LT		List all NTS messages in the system
LY		List this station's usage statistic
L> CALL LTO		List all messages addressed to "CALL"
L< CALL LFM		List all messges from "CALL"
L@ CALL		List all messages addressed "@ CALL"
NTS		List all "pending" NTS messages
PAGE		Page Mode (ON/OFF). Show current mode w/o
R #	READ #	Read a specific message number WITHOUT headers
RC		Read all my pending messages without your confirmation
RH #		Read a specific message number WITH routing headers
RM		Read all my unread messages WITHOUT headers
SP CALL		Send a PRIVATE message to CALL. May stay at this
SP		Send a PRIVATE message to CALL at MMCSCALL (4)
SB TOPIC		Send a BULLETIN to TOPIC
SB TOPIC@DESTN		Send a Bulletin to TOPIC at DESTINATION
ST		Send a NTS message
TIME		Show daily MMCS usage limit and time left
T		TALK Alert the Sysop
V	VERSION	Ask for the current WinLink software version
Y		Send the next group of lines

Note: You may still read a Deleted message until the next message purge cycle, but you must remember its message number.

6-6.5. Initial BBS Use. When a MARS operator connects with a BBS for the first time, he may be asked to register. In some cases, the BBS system operator (SYSOP) may have manually completed the registration for his Region operators. If you are asked to register after registering in the past, it is just an indication of a hard disk crash or change in the BBS system. Registration consists in providing your first name, city, ZIP code and your "Home BBS." This information will be used to forward any traffic sent to you from out of state to you. You can use the callsign of your Region BBS as your Home BBS. Just follow the prompts on the screen to enter the registration information. One additional point to remember when using any BBS is that it will control the direction (sending or receiving) of the link.

6-6.5.1. **Listing and Reading Messages**. Unlike a simple TNC based mailbox the Winlink or MSYS BBS based system has the ability to remember which messages you list on your prior connects to the system. There are a number of ways to list traffic:

- The command **LL** will list all new traffic posted since your last connect.

- The command **LB** will list all new bulletins posted since your last connect.

- The command **LLB 5** will list the last five bulletins posted without regard to your last connect.

- The command **LM** will list all traffic held on the BBS that was either sent by you or sent to you.

- The command **NTS** lists all third party traffic posted since your last connect. Reading traffic is done very much like the procedure used with a PBBS.

- The command **R #** will cause the BBS to send you the message indicated by number # in the listing, e.g., R 1246 will result in the BBS sending you message number 1246.

- The command **RM** will result in BBS sending you all new traffic addressed to you in a continuous stream without a break between messages. However, the BBS may pause after a certain number of lines set by the system operator and ask if you wish to continue for the next group lines or continue without a pause or quit reading the message or messages. Enter your desired response by sending a single letter as follows:

    Y - Send the next group of lines.

    C - Send the remainder of the current message and all other pending messages without a pause.

    A - Quit reading all messages pending.

    B - This pause can be eliminated for your station by sending the BBS command PAGE OFF

6-6.5.2. Sending traffic to an BBS. For in-state traffic you can use the same procedures for sending traffic to a TNC based mailbox. For out-of-state traffic it is necessary to indicate some routing information so that the MARS traffic system (Region and Area and other state gateways) will know how to forward your traffic.

6-6.5.3. Adding the Routing Indicator of the final BBS after the callsign of the recipient indicates the routing. For example, the command ST AFN1EC@AFA#PZ is used to

send traffic such as an exercise EEI to the National Emergency Coordinator. In the case of a
MARSGRAM, the postal zip code should be used, such as ST 10048@AFA#PZ. If you don't
know the destination call then you would address it zip code to zip code such as ST
10048@10048. MARSGRAMs going to Southwest Asia via the ARMY MARS European
Gateway, use ST 99123@AE1USA as the routing indicator.

> 6-6.5.4.   The BBS will then prompt for a Subject line that will appear in the message
listings. For example:

> *Subj:*
> *EXERCISE EEI BROKEN TRACKS KS* could be used for an Exercise EEI being
> sent to AFN1EC from Kansas.

> For a third party MARSGRAM, the message must contain information such as city
> and telephone prefix that will expedite routing and delivery when it is received at
> the final TRANSCON Station. This information allows the SYSOP to direct the
> MARSGRAM to a station close to or within the toll free calling area for delivery.
> For messages to another MARS member, use a short description of the content of
> the message. For Example:

> *HF NODE INFO*

> The BBS prompts for the message header and text by transmitting:

> *Msg:*

> The operator sends the text and terminates with the /EX or <control>Z EOM
> indicator and the BBS responds with:

> *Message filed.*

> Unfortunately, Winlink does not receipt for a message with its message number.
> The older MSYS software does this and the operator could make note of this in his
> message log. With Winlink, the only way to get this information is to send the
> command LL and get a two line listing of this most recent traffic.

> 6-6.5.5.   Keyboard Users can only see messages addressed TO and FROM themselves.
BBS stations can see any message in the system. Send "LOC" location (message number or
number of messages) to start the list or list. Oldest message "O" – Newest message "N." A
message sent without routing information (Hierarchal Routing) may stay at that BBS until the
recipient connects to that same station to read it.

> 6-6.5.6.   MCSCALL.HR = Routing indicator of BBS with hierarchal route, where the
message will automatically be forwarded to. For example, a complete hierarchal routing
indicator might look like this:

> AFA#YX@AFA#LK.KS.RGN3.AF.USA
> | | |
> | | → Hierarchal routing showing State, Region,
> | | miltary service and area
> | → MCS-Routing Indicator
>   → Callsign of Address

Attachment 6-1

Prosigns and Operating Signals.

A6-1.1.   Prosigns. Prosigns are single letters or letter groups that have a specific assigned meaning when used a part of digital net operations. They were transferred directly from the older CW prosigns. Most prosigns have a corresponding voice proword. Table 1 below lists commonly used prosigns and the equivalent proword.

TABLE 6-3	PROSIGNS and PROWORDS	
Prosign	Meaning	Proword
AA	Unknown Station or All After	ALL AFTER
AB	All Before	ALL BEFORE
AR	End of transmission	OUT
AS	Wait	WAIT
B	More to Follow	MORE TO FOLLOW
BT	Break, this separates the heading from the MSG and the MSG text from the end of the message	BREAK
C	Correct	CORRECT
DE	This transmission is from the station whose callsign follows	THIS IS
EEEEEEEE	Error (Eight E'S sent sequentially)	CORRECTION
FM	The Originator's Designation Follows	FROM
G	Repeat back (entire message transmission is Repeated back to the sending station.)	READ BACK
GR(Numeral) Group	Group Count. The message text contains (numeral) Groups. Used only when sending encrypted messages.	
IMI	Repeat. Used to indicate a word is repeated for verification or emphasis.	I SAY AGAIN
INFO	Information Addressee(s) designator(s) Follow	INFO
INT	Interrogatory (Asking a question) This prosing precedes a "Q" or "Z" signal normally to indicate a query to the respective signal.	
J	Verify with Originator and Repeat	VERIFY
K	Invitation to transmit	OVER
M	MARSGRAM (Precedence)	MARSGRAM
MSG	Message	MESSAGE
NR	Number	NUMBER
O	Immediate Precedence	IMMEDIATE
P	Priority Precedence	PRIORITY
R	Receipt, Routine, Roger ROGER	ROUTINE,
SGD	(Signed) Signature follows	
T	Transmit to designated station(s)	
TO	Action Addressee(s) designator(s) follow	TO
WA	Word After	WORD AFTER
WB	Word Before	WORD BEFORE
XMT	Exempted Addressee(s) designated stations need not acknowledge receipt.	EXAMPT

A6-1.2.   Q and Z- signals. Q and Z- signals are three letter groups that have a specific meaning when used as procedural signals. The Q-signals were developed by early Morse operators. Z-signals were developed later by military operators. Z-signals are sometimes modified by the addition of a single numeral after the three letter group. Q and Z signals should

be used sparingly. Sometimes it is more efficient and less confusing to type a directive in plain text rather than use a rare Z-signal. For example, an NCS can put a net into freemode by sending:

> *DE AFA#CZ THE NET IS INFORMAL AR*

or by sending

> *DE AFA#CZ ZUG ZKD AR*
> (ZUG - Negative)
> (ZKD - Obtain permission before transmitting)

    6-1.2.1.   Table 2 contains a list of common Q and Z-Signals. It is recommended that only those signals listed in Table 2 be used on MARS nets. You may not use some of those listed but remember under interoperability you may be handling traffic from another service that does.

TABLE A6-4	ABBREVIATED LIST OF OPERATING SIGNALS		
Signal	Meaning	Signal	Meaning
ZAX	You are causing interference	ZBO	I have traffic
ZDE	Message undelivered	ZEN	Message copy sent by other
ZEU	Exercise (drill) msg		
ZFG	This msg is an exact duplicate of	ZGN	Nothing heard
ZKA	I am net control msg previously sent.	ZKB	Obtain permission before transmitting
ZKD	Take net control	ZKE	I am checking into the net
ZKJ	(1) Close down until … (2) I am closing down	ZKS	Following stations are in the net
ZOD	Act as relay	ZOE	Send me your msg for
ZOF	Relay msg to (May use email if email address is included)	ZOG	Send your msg to
ZOJ	Wait	ZRA	Your freq is (1. correct) (2. high) (3. low)
ZRB	Check your freq	ZRC	Tune your xmtr to (1. proper freq) (2. zero beat)
ZRF	Will send tuning signal on present frequency	ZUE	Affirmative
ZUG	Negative	ZUH	Unable to comply
ZXX	This message has been delivered to all information addressees whose designation follow.	ZYJ	This is a SHARES msg
QRK	Readability (1-5)	QRU	I have nothing for you
QRV	I am ready	QRY	Your turn is
QRZ	You are being called by	QSA	Signal Strength
	Who is calling		
QSG	Send___msgs at a time	QSL	Acknowledge Receipt of Information
QSO	I can communicate with	QSZ	Send words twice
QTA	Cancel my msg NR____	QTB	I do not agree with your Group Count

Note -Operating signals have interrogatory sense when preceded by Prosign INT

Attachment 6-2

Digital Modes

A6-2.1.   MARS Digital Modes. The Chief USAF MARS has always encouraged members to experiment with new digital modes in order to increase our reliability in carrying out the MARS mission. The only constraint on new digital modes imposed by the USAF Frequency Managers is that the emission bandwidth of any MARS digital transmission must not exceed the emission bandwidth of a radiotelephone signal. If a new mode is developed and it meets the 2.8 kHz emission bandwidth limitation. Permission to use a new mode in MARS operations can be obtained by submitting a request up the chain of command. Usually, a test team will be designated to determine the pros and cons of a new system before it is fully accepted into the program. The following paragraphs are a brief description of each of digital modes currently in use in USAF MARS along with a summary of their advantages and disadvantages.

      A6-2.1.1.   RTTY or Radio Teletype . This is the original radio teletype mode using the 5 level Baudot code. It is transmitted using either Frequency Shift Keying (FSK) or Audio Frequency Shift Keying (AFSK) modulation with a mark/space frequency of 2125/2295 Hz and 170 Hz shift. The five level code limits this mode to 32 characters, but the use of Letters/Figures shift allows 61 characters. This limits text to uppercase characters, numerals and a few punctuation marks. There is no error detection or error correction with this mode.

      A6-2.1.2.   ASCII. The American Standard Code of Information Interchange (ASCII) is the 8 level code use to represent characters in modern computer. It can support the full set of upper and lowercase characters. If only 7 of the 8 bits are used for information, the 8th bit can be use as a parity bit which can use for error detection. However, few digital software packages use this feature.

      A6-2.1.3.   Packet Radio. This mode uses an Amateur Radio modification of the international X.25 protocol for land line packet switching known as AX.25 protocol. The message is broken into packets which contain an address header, the data and a checksum. The receiving packet station computes the checksum of the received packet and compares it to the checksum sent by the transmitting station. If they agree, the packet is acknowledged (ACK) to the sending station who then sends the next packet. Otherwise, the receiving station sends a negative acknowledgment (NAK) and the sending packet station re-sends the packet until an acknowledgment is received. This mode requires a high signal to noise ratios for a good throughput. It works well over a VHF FM channel at a signaling rate of 1200 or even 9600 baud. Speeds of 300 baud can be used on an HF channel, but experience over the last 20 years in MARS suggests that this mode be used only when none of the more robust HF modes are available.

      A6-2.1.4.   AMTOR (Amateur Teletype Over Radio). This is the amateur radio implementation of the commercial SITOR mode by G3PLX. It uses a 7-level Murray code and actually has two modes. Mode A or ARQ (Automatic Repeat request) uses a short three character burst. Errors can be detected at the individual character level. This is a "connected" mode in which the sending station transmits the bursts and receiving station sends ACK or NAK short burst in between sending bursts. Mode B or FEC (Forward Error Correction) is a broadcast mode. Each character is sent twice, but the transmission of the second character is delayed by three characters to take advantage of the short burst nature of radio static. The receiving station compares the two copies of each character. If either or both are valid characters that character is

printed. If neither character is valid, then an error character is printed. Most AMTOR software uses the underscore "_" as the error character. The 7-level Murray code supports only the uppercase character set of the Baudot code. ARQ speeds are up to 100 wpm while the FEC mode is a fixed 50 wpm.

A6-2.1.5.   PACTOR. PACTOR is a proprietary mode developed by Special Communications Systems (SCS) GMBH from Germany. They have developed three Levels or Modes, Level I has been licensed by other manufacturers for use with their terminal mode controllers. Levels II and III are still proprietary and can only be operated using one of the SCS TNCs such as the SCS PTC-IIe, IIex, or SCS II Professional. Most modern amateur HF TNCs are licensed to transmit PACTOR I. At least one Linux-based soundcard software package is capable of sending and receiving PACTOR I. Several software packages claim PACTOR I receive capability. PACTOR combines features of both Packet and AMTOR and supports the ASCII code is used for the characters. PACTOR I also uses the 170 or 200 frequency shift keying tone shift similar to Packet and AMTOR. Modulation of PACTOR II signals is based on differential phase shift keying (DPSK). PACTOR III uses a voice channel of 2.4 khz and with an optimal link, is 4 to 5 times faster than PACTOR II mode. PACTOR III utilizes up to 6 speed levels and up to 18 tones spaced at 120 Hz. Maximum bandwidth is 2.2 kHz and a center frequency of 1.5 kHz. In the ARQ mode, there is a dynamic adjustment to speed. If repeated NAKs are sent by the receiving station, the sending station will slow the speed of transmission. When several slow speed packets are received without error, the sending station will attempt to raise the speed. In addition to the basic signaling rates of 100 and 200 wpm additional message speed can be had by using optional Huffman compression. The PACTOR FEC mode is similar to the AMTOR FEC mode except the sending operator can specify the number of times that a character is repeated. The number of repeats can be increased from the default value of 2 up to a value of 5. This brings about a major increase in broadcast transmission reliability at the price of speed. Because of the 200 wpm maximum speed, PACTOR transmissions need to use a minimum 200 Hz shifts. PACTOR ARQ is the preferred mode used for HF MMCS operations.

A6-2.1.6.   G-TOR. This is a proprietary mode developed by Kantronics and implemented in their KAM (Plus/98/XL) series of TNCs. It is an acronym for Golay Teletype Over Radio. It is a robust ARQ mode that dynamically adjusts transmission speeds among 100, 200 and 300 wpm in response to error rates. It uses frequency shift keying similar to PACTOR and packet radio. It is rarely used and not recommended.

A6-2.1.7.   CLOVER/CLOVER 2000. Clover is another proprietary mode and was developed by HAL Communications Corporation. It requires special hardware either in the form of an external TNC or a personal computer plug-in ISA card. Clover is a dynamic ARQ system using four tones phase modulated in several modes that change according to conditions. The hardware monitors the error rate and adjusts the mode accordingly. Under poor conditions a 62.5 wpm ARQ mode will be employed; under excellent conditions transmission speed will increased to the equivalent of 750 baud. CLOVER 2000 is a significant upgrade allowing about 4 times faster throughput but a wider bandwidth (2 kHz) centered between 500 and 2,500 Hz. It is currently **not authorized** within the MARS network.

A6-2.1.8.   PSK-31. This was the first of the popular sound card modes. It was developed by Peter Martinez, G3PLX as a keyboard-to-keyboard digital mode. It uses narrow band phase shift keying at a modest data rate of 31.5 baud and a variable length code. Maximum typing speed is 50 wpm. It is a narrow band mode and the powerful DSP capability of sound

cards makes it possible to copy signals even when they cannot be heard. The basic modulation scheme is BPSK without error correction. Since the emission bandwidth is on the order of 80 Hz, a single voice channel can support more than a dozen simultaneous keyboard to keyboard transmissions. This is a major advantage for MARS in times of heavy traffic load.

A6-2.1.9.   QPSK-31. This is an often overlooked extension of PSK-31 with robust FEC. A high degree of interleave and Verbiti decoding is used such that there are 32 opportunities to correctly receive any 5 bits in the Varicode stream. It is effective under poor propagation conditions.

A6-2.1.10. MFSK-16. This is a multi-tone (16) FEC mode. It is loosely based on the old British Piccolo system using relatively narrow tone spacing. It has an effective 30-80 wpm data rate and uses about a 316 Hz bandwidth. It has proven to be a good weak signal, long distance mode. The narrow spacing and narrow bandwidth require accurate tuning and frequency stable transmitters.

A6-2.1.11. MT-63. This mode uses 64 tones and spreads the transmission of any single character over frequency and time. It is reported that the sophisticated FEC scheme used can recover from up to 25 percent obliteration of a character. The emission bandwidth is either 500, 1000 or 2000 Hz and is user selectable. Initial settings for MT-63 are typically Bandwidth 1000 Hz, Non-Inverted, Long Interleave. This is generally the default for most software packages designed for this mode of operation. Some sources state that tuning is critical and requires a very frequency stable transceiver on both ends; other users have found this to be debatable. The spreading of each character over time, does lead to some delay in the display of text. However, its performance has made it the mode of choice for traffic handling in many MARS net.

A6-2.1.12. B-12. ALE. ALE is an acronym for Automatic Link Establishment. It can be viewed as a digital HF system rather than a digital mode as it uses several modes. It is important to the MARS mission, as it is the method of HF digital communications used by several of our served agencies such as DOD, SHARES and FEMA.

A6-2.1.12.1. Until recently this system was only available to MARS member willing to purchase the expensive commercial hardware implementations as there are few ALE devices that have moved to the surplus property inventory. It is an implementation of Mil-Std 188-141B and FED-STD 1045A. More information can be found of the NTIA web site http://www.its.bldrdoc.gov/pub/oa-rpt/hf-ale/handbook/.

A6-2.1.12.2. Charles Brain, G4GUO, wrote a computer soundcard implemented version of ALE nicknamed PC-ALE that opened this system up to MARS members at relatively low cost. Mr. Brain released his source code to a MARS development team that is currently (2005) continuing the development and the current software is now nicknamed MARS-ALE. The ability of the sound card version of ALE to connect with a military hardware was demonstrated during Grecian Firebolt 2004 and 2005.

A6-2.1.12.3. Because of the requirement for military users of ALE to be registered with their parent service, MARS members must obtain permission to operate ALE though their State Director to the corresponding National ALE Coordinator. A separate operating guide will be published for approved MARS-ALE users.

Attachment 6-3

DIGITAL HARDWARE INTERCONNECTION

A6-3.1.   Digital Operations. Digital operations will involve a transceiver, computer and interface device. It is beyond the scope of this document to treat every combination of equipment. The information required to connect these devices can be found in the user manuals of the radio transceiver and the interface devices. This Attachment is intended to summarize the advice of experienced MARS digital operators on connecting and adjusting these devices.

A6-3.2.   Terminal Node Controllers (TNC) and Multimode Controllers (MMC).

A6-3.2.1.   Computer to TNC/MMC connections. This is usually accomplished with a standard RS-232 serial cable. For all known devices, a straight though cable and not a so called "null modem" cable is required. The user need only match the pins on the computer port and the TNC or MMC. These will be either a 25-pin or 9-pin connectors. In the absence of commercially available cables it is a relatively easy matter to fabricate these cables since normally only a three-wire connection is required and DB-9/25 shells are readily available.

A6-3.2.2.   RS-232 Legacy problem. The computer industry has unilaterally declared the RS-232 serial interface to be a legacy (obsolete) device and is not included as a standard input/output port on many new computers, especially laptops or notebook type computers. As of mid 2005, there is only one TNC available with USB port connectivity (SCS PTC-USB), however several companies have announced upcoming products based on USB connectivity. If your computer does not have a serial output port, then either a USB to Serial adapter or a serial interface card must be installed in your computer. Caution, not all USB to Serial cards may work with your specific system. Save your receipt in the event you need to try a different cable or interface card.

A6-3.2.3.   Transceiver to TNC/MMC (receive). These cables must either be built by the user or purchased from a third party source. In 2005 both MFJ Enterprises and Buxcom began offering pre-wired cables to interconnect all current TNCs to most transceivers. These are recommended especially if your transceiver uses the difficult to homebrew 13-pin DIN plug to connect to the MMC.

A6-3.2.4.   TNC/MMC to Transceiver (transmit). -The TNC/MMC can be connected either to the microphone connector or to the rear-panel auxiliary/accessory (ACC) port of the transceiver. The use of the ACC port is recommended as it eliminates the need to swap cables or use a microphone/TNC switch. In addition, the ACC port usually has a fixed level audio output that is independent of the front panel volume control and a "push-To-Talk" (PTT) presented to this ACC port can mute the microphone input during digital operations. Use of the microphone input may require an additional cable if the received audio is not present on a spare pin of the standard microphone connector.

A6-3.2.5.   Transmit Audio Level Adjustment. Once the transceiver, TNC/MMC and computer have been connected, the operator needs to make a one-time adjustment of the audio level out of the TNC into the transceiver. This may require temporary removal of the cover on the TNC to access the level control adjustment. Follow the instructions of the TNC

manufacturer for this adjustment. Generally, this involves placing the system in a digital transmit calibration mode, keying the transmitter and adjusting the audio level such that there is little or no Automatic Level Control (ALC) action indicated by the transceiver's metering circuits. Some newer transceivers provide an adjustment of the incoming auxiliary port audio by a front panel menu function. Refer to your transceiver user's manual to see if this alternative method is available to you.

A6-3.3.   Sound Card Interfacing. In general, the transceiver audio output is connected to a sound card input and, a sound card output is connected to the transceiver audio input. There are audio level considerations that must be addressed. In addition, it is best to use some form of audio isolation between the sound card and transceiver. A sound card may have only two inputs, a microphone input and an earphone/speaker output. Some sound cards have line level inputs and outputs; if available, the use of these ports is recommended. In most cases, especially when using microphone inputs on both the transceiver and sound card, some form of audio attenuation is required. If this attenuation is not provided by an interface device, then a simple -40 dB pad consisting of a 100 k ohm and 1 k ohm resistive divider will provide the necessary attenuation and allow the sound card controls to function at mid range.

   A6-3.3.1. Interface devices

        A6-3.3.1.1.   Interface devices for sound card digital modes are offered by a number of manufacturers including West Mountain Radio (RigBlaster, NoMic), Buxcom (Rascal), and MFJ Enterprises (MFJ-1273/1275/1279). Additionally, many of the TNC manufacturers are including soundcard interfacing as part of their Multi Mode TNCs. All these devices perform as specified. The new digital operator is encouraged to consult experienced MARS operators in their state for more information. This is a personal decision and Army MARS cannot make any recommendations as to one manufacturer over another. One can also build an interface from parts using designs published in the amateur radio literature.

        A6-3.3.1.2.   In 2004, a new type of interface device called the RigExpert was released by the authors of the popular MixW digital sound card software. This device includes soundcard hardware and transceiver interface circuitry in a small external package which includes the PTT line. It communicates with the host computer using only the new industry standard USB serial interface. Informal, initial reviews are good.

        A6-3.3.1.3.   External soundcards -External sound cards are available for personal computers. These communicate with the host computer using the USB 2.0 serial interface. MARS members converting to external sound cards from older internal sound cards report some performance improvement as the external sound card is isolated from internally-generated computer "hash". However, this type of sound card still requires audio isolation and a perhaps a digital PTT line.

A6-3.4.   PTT line or VOX Keying.

   A6-3.4.1. Transmitter Keying. Sound card based software needs some method keying the transceiver. Perhaps the simplest method is the use of the VOX (Voice Operated relay) of the transceiver. The disadvantage of this method is that it requires the use of a short VOX Delay,

which can be annoying if the operator uses VOX for radiotelephone operations. The preferred method is to use one of the computer serial ports to key the transceiver through a suitable interface for the RS-232 RTS or DTR lines. (Note only the RTS line can be used with ALE as the DTR line is reserved for other transceiver control). Most of the digital sound card interfaces discussed above provide a serial interface connector and suitable isolation. The disadvantage of this method is that it ties up a serial port or requires that the user purchase and install a USB-to-serial adaptor for computers without an RS-232 serial port.

A6-3.4.2. <u>Unintentional Transmitter Keying</u>. **CAUTIONARY NOTE: IT HAS BEEN OBSERVED THAT DURING COMPUTER BOOT UP AND SOUND CARD PROGRAM INITIALIZATION, SOME USB-TO-SERIAL ADAPTORS MAY UNINTENTIONALLY KEY THE TRANSCEIVER. IF THIS IS OBSERVED, THE DIGITAL OPERATOR MUST TAKE STEPS TO AVOID KEYING UNINTENTIONALLY**. This can be as simple as not powering the sound card interface until the computer has booted up and the sound card program has loaded or changing a function switch to another position during the boot-up sequence.

A6-3.4.3. <u>Level Adjustment</u> -Level adjustment for digital sound card operations is required for both transmit and receive audio.

A6-3.4.3.1. The adjustment can be performed at the both the sound card interface device and the software sound card level adjustment panel. Experience has shown that both adjustments in conjunction with any fixed attenuation should be used so that the software "sliders" are normally at their mid-range setting. Consult the user's manual for the digital software program in use at your station for details. Pay particular attention to setting the transmit-audio-level for no ALC action to insure undistorted signals.

A6-3.4.3.2. Operators who use multiple sound card programs may find that different programs require different audio in/out computer settings. A record should be made of each program's configuration to allow proper operation during program application changes. Alternatively, there are utility programs that will store the different audio level configurations making it a simple matter to configure computer audio settings to support each application easily. One such "freeware" product is Quickmix, available at: www.ptpart.co.uk/quickmix/

Attachment 6-4

SOFTWARE FOR DIGITAL OPERATIONS

A6-4.1. **General**. Successful digital operations in USAF MARS does not depend solely on the terminal or sound card software itself; success depends primarily on the MARS operator's skill in using the hardware and software of choice. This Attachment lists the minimum set of skills that needs to be acquired and presents a short review of commonly used terminal and soundcard software. The MARS member beginning digital operations is encouraged to acquire a copy of the software in use by most of the other MARS members. Help and training in the use of the software will then be readily available.

A6-4.2. **Legacy Issues**. Most TNCs communicate with the associated personal computer using an RS-232 serial interface. About the 2000 time frame, many new personal computers were being sold without the RS-232 serial ports. Many manufacturers and operating system developers have dropped support for the RS-232 serial port in favor of the USB or FireWire serial protocols to communicate with external peripheral devices. A quick fix for this problem when upgrading to a new computer is to purchase a USB-to-Serial adapter which creates a virtual COM port in the computer. However, older software or operating systems may not recognize or be able to use this virtual COM port. In this case the MARS member will probably have to upgrade his terminal software to match the upgraded computer and operating system.

A6-4.3. **Requisite Digital Skills**. The MARS operator through training, mentoring and practice needs to acquire the following skills in the use of the digital software of choice as a minimum for successful digital operation.

- Establishing a Packet or ARQ connect
- Perform ARQ change over and disconnect
- Perform FEC transmit/receive control
- Load a text file message into a transmit buffer
- Send a message from a file or buffer
- Save a received message to a file or buffer
- Save a receive buffer to a file

A6-4.1. **TNC or MMC Terminal Software**. The following Table identifies a number of software packages that are currently in use within the MARS program. This list is not all-inclusive and does not imply an endorsement to any particular package. Following the table you will find short descriptions identifying specific features of each software package.

Table A6-6	TNC Control Software		
Title	Systems	Type/Author	Source
Hyperterm	Most TNCS OS	Commercial/Microsoft	Integral to Windows OS
MFJCom	MFJ 1278	Commercial/MFJ Enterprises	MFJ Enterprise
PACTERM	AEA/Timewave/Kantronics	Commericial/Creative Services Software	Amateur vender or CSS Website
XPWare	Most TNCs	Commercial/KF7XP	XPWare Website
Airmail2000	Most TNCS	Shareware/	Airmail Website
Hostmaster	Kantronics		Kantronics
PCPakratt for Windows	AEA/Timewave	Commercial	Timewave
TelPac	Most TNCs	Shareware	Winlink Web Site
PacLink	Most TNCs	Shareware	Winlink Web Site

A6-4.1.1. **Hyperterm**: This is a standard terminal software package included with the Windows Operating Systems and found under Accessories. It treats your TNC similar to a telephone modem and performs the required functions for communicating with a TNC, but requires that the operator be familiar with the native TNC commands.

A6-4.1.2. **MFJcom:** A simple DOS based terminal program for communicating with any TNC. It has an advantage over Hyperterm by not being cluttered with dial-up capabilities. It also can extract and save TNC settings.

A6-4.1.3. **PacTerm**: Software developed for communicating with the PK-232 TNC/MMC originally developed by AEA and now produced by TimeWave. This software handles both the TNC operation and the setting of TNC parameters with menu screens. A unique feature gives the user the option of downloading the TNC parameters at the start of each session or installing a battery to preserve the settings in the TNC memory between sessions.

A6-4.1.4. **XPWare**: A Windows based communications and TNC control software package. If has all the functionality required for MARS digital operations with a hardware TNC for both passing traffic and controlling the TNC using point and click mouse operations. There are separate versions for each of the common TNCs. It is widely used and is suggested for general use by many MARS members. The DOS version is no longer supported.

A6-4.1.5. **PCPakratt for Windows**. A Windows based communications and TNC control software package for the PK-232 series of TNCs. It has all the functionality required for MARS digital operations with AEA/Timewave PK-232 hardware for passing traffic and for controlling the TNC using point-and-click mouse operations. The configurations for the TNC are stored as a configuration file and the PK-232 hardware is automatically updated when launched.

A6-4.1.6. **Airmail 2000**. This is a relatively new client for the defacto MARS standard Winlink MMCS server. It has the look and feel of a Windows E-mail client for sending and receiving messages. It has an additional terminal mode for controlling a TNC, transceiver

frequency control and connecting with Winlink. It is freely distributed and may be a good choice the new digital operator.

A6-4.2. Call Signs. Many of the vendors that require registration for their software that is tied to your amateur callsign will also incorporate your MARS call sign into the configuration file provided. This allows you to use the software for both amateur and MARS operations.

A6-4.3. Note for Macintosh computer users. There is no currently available commercial TNC control software for the Macintosh platform. AEA (no longer in business) produced a series of programs called "MacRatt" that were designed to control the PK-232 TNC. Members may be able to obtain this software from private sources.

A6-4.4. Sample of Soundcard Software. Table D-2 and descriptions identifies a number of software packages that are currently in use within the MARS program. This list is not all inclusive and does not imply an endorsement to any particular package. There are many sound card programs to choose from. Each member should select the one best suited for his/her finances and use. Following the table you will find short descriptions identifying specific features of each.

Table 6-7	Sound Card Software	
Title	**Type/Author**	**Source**
MixW	Shareware/License Fee/ UT2UZ	MixW Web Site
Digipan	Freeware/KH6TY	DigiPan Web Site
Hamscope	Shareware	Hamscope Website
MARS-ALE	Shareware/ G4GUO	MARS Dev. Team

A6-4.4.1. **MixW**: This is a well-supported general soundcard software package. It supports most soundcard modes including PSK-31, QPSK-31, MFSK-16, MFSK-31, and MT63. Its Slow Scan TV (SSTV) has an auxiliary function by which the soundcard can be calibrated to an accuracy of 0.1 Hz by tuning to WWV in the SSTV mode. It is well worth the $50 shareware price.

A6-4.4.2. **MARS-ALE**. This software package was originally developed by Mr. Charles Brain, G4GUO, as PC-ALE to provide ALE functionality in software. In conforms to MIL33 STD 188-141A and FED-STD 1045A. Development was suspended as the author went on to other interests. However, in 2002, MARS operators began experimenting with PCALE as a means of communicating with military HF stations. In 2004, the author turned development of PC-ALE to the Army MARS Region 2 ALE team. This team continues to develop and expand the program under the title MARS-ALE.

A6-4.4.3. **Notes for Macintosh computer users.** There are at least two programs for non-TNC soundcard operation:

      (1)   Multimode by Black Cat Systems (Commercial)
                http://www.blackcatsystems.com/software/multimode.html

      (2)   CocoaModem by W7AY (Freeware): http://homepage.mac.com/chen/

Attachment A6-5

Airmail 2000 Set up Guide for MARS Operations

A6-5.1.   General. Airmail 2000 is a very versatile software tool for MARS members to use connecting to a MARS Message Center System or MMCS using HF PACTOR or VHF Packet. This Attachment does not pretend to be an all-encompassing-guide but simply provide a step-by-step method for accomplishing the primary tasks. It is recommended that you find a local mentor who has used the software and perhaps developed their own shortcuts on how to perform various tasks.

A6-5.2.   Software Availability. Airmail 2000 is a Shareware package available for download from the following website http://www.airmail2000.com As with any sophisticated software package, there is usually more than one way to accomplish a task. The following examples work for the author.

A6-5.3.   Dual Use – MARS/Amateur. If you intend to use Airmail for both amateur use and MARS use, you should create a directory on your hard drive called "MARS Airmail" and a separate directory named "HAM Airmail."

    A6-5.3.1.   Install one copy into each directory. This is done to allow separate configurations for each way you may wish to use the software. This Attachment will only address setting up your Airmail application for MARS use and creating MARS messages using the Airmail software tool.

    A6-5.3.2.   The first time you open the software it will open a wizard to assist you in configuring for your system. Click "Cancel".

    A6-5.3.3.   Open the "View" tab and "Station List". To configure for MARS operations, highlight the "HAM" folder and delete it. Select "New" and a box will ask you for the "System Name". Type in "MARS" and click "OK", then "OK" again and close the application. This will create a ""System.MARS.ini" file. Later we will show you how to manually edit this file.

    A6-5.3.4.   Open the Airmail software again and type in your MARS call sign when asked by the wizard. Click "OK".

    A6-5.3.5.   To complete you configuration, open the "Tools" folder and then select "Options…". A second window will open where we will select several key settings for your MARS configuration. Normally, you will only need to do this once unless you have more than one type of TNC connected to your computer. The first folder open should show your modem (TNC) connection. Airmail currently has software drivers to support the following model TNCs

- SCS PTC series (I, IIe, IIex, II, II Pro)
- MFJ (1226, 1278B)
- Kantronics (KAM+, -98, -XL)
- Timewave / AEA (PK-232, PK-900, DSP-1232, DSP-2232)
- HAL Communications (DXP-38)

A6-5.3.6.   Select from the drop down window the TNC you are currently using.

A6-5.3.7.   Select the COMM Port (serial port) you are using with the TNC and the appropriate baud rate supported by your TNC. The Airmail software will normally preselect the highest baud rate supported by your TNC but you may need to match the baud rate manually to ensure the computer will "talk" to you TNC. Click on "Apply" each time before moving to the next tab to ensure your changes take effect.

A6-5.3.8.   Proceed to the second tab "Settings". Fill in your MARS call sign and in the "From" name, just your last name. If your TNC is only PACTOR Level I capable, you will need to check "Use Basic MMCS protocol only" under "BBS Forwarding Protocol". Under Keyboard mode, it is recommended that you enter Auto-wrap value of "60". Under Messages, enter the value "60" as "Max characters per line:". Deselect "Show Header Panel".

A6-5.3.9.   The "Folder" file may be left with the default settings.

A6-5.3.10. Select the "AutoAnswer" tab. Check "Accepted Incoming Connects". Fill in the "Welcome Text" as you would prefer. One example you may choose is: "Welcome to the PACTOR Station of YOUR CALL SIGN / STATE".

A6-5.3.11. Select the "Routing" tab. You should check with your local state digital coordinator to determine the appropriate information for this tab.

A6-5.3.12. Leave the defaults for "Fonts" as is.

A6-5.3.13. Select the "Modules" tab. For HF operation, leave only the "Terminal Window" and "Show in Taskbar" boxes checked.

A6-5.3.14. Select the final Tab "Spelling". The settings here are personal but it is recommended that you select the following active:

- "Check spelling as you type"
- "Ignore words containing numbers"
- "Suggest from main dictionaries only"
- "Prompt on repeated word"
- Dictionaries – "American"

    Close the "Options" window.

A6-5.3.15. The next step will allow you to setup the terminal window for the stations you normally connect to.

A6-5.3.15.1.   From the primary AIRMAIL [Message Index] Window, select "View" and then the "Station Index". Highlight "MARS" and click "New" to add a call sign of a station that you will be connecting to. This can be an individual station or a MMCS identifier. Click "OK".

A6-5.3.15.2.   Now, with the call you just entered, highlight or click on the station identifier you just added and click on "Settings". Add the station call sign, remember that if it is

a 7-character call sign that you may need to shorten it the appropriate routing indicator. For example, AAA9USA will be shortened to AA9USA. It must match the call sign that the other station software is using to ensure that you can connect to it. Also in this window you must check the boxes according to the modes you operate. Unless you own one of the SCS TNCs, you will probably only check the "Pactor" box. If you know the frequencies that the station normally monitors, you can also enter these frequencies in the "Frequencies" window, normally one frequency per line. Entering the Latitude/Longitude is optional and normally not used for MARS operations.

A6-5.4.   Messaging Addressing, Formatting And The Airmail Address Book. The simplest and most efficient method for preparing messages for transmission in Airmail is to simply avoid using the Airmail Address book. From the [Message Index] window, select "File" and then "New". The Airmail Address window will pop open. Click cancel and you will have a clear message screen to begin preparing your message. You may now type your message. On the first line type the address of the station you wish to send your message to. For example: **ST AFN1EC@AFA#PC**. On the second line type the subject line such as: **EXERCISE EEI** or **ACTUAL EEI.** Leave the third line clear and then begin type your message using the standard 16-line format:

> *DE AFA#XT NR 101*
> *R 172005 JUL 2005*
> *FM AFA#XT MD*
> *TO AFN1EC ME*
> *BT*
>
> …. (your message text)
>
> *BT*
>
>
> *NNNN*
> */EX*

> Once you have completed the message you are ready to post the message for sending. To send your completed message, click on the "Mailbox Icon" and the window will close and your new message will appear in the [Message Index] with the mailbox icon indicating it is waiting to be sent.

A6-5.1.   AIRMAIL Terminal Window. Before you can actually send your traffic you must ensure that your TNC is properly connected and turned on. From the [Message Index] window, you have a couple options, either press the [F6] function button or click on the [Terminal Icon] to switch to the [Terminal] window. The program will automatically attempt to initialize your TNC and send the appropriate control codes to prepare it for operation for the mode selected. You will see a series of commands in the terminal window as these settings are sent to the TNC. Once properly initialized you will see the Green "Connect" button.

A6-5.1.1.   Make sure the correct mode is selected by clicking on the "handshake" icon for automatic sending and receiving any traffic for your station or the "keyboard" icon for advanced functions such as reading bulletins.

A6-5.1.2.   Along the top you will see two small windows. The first will be a space to select the station call sign of the station you wish to connect with. The drop down arrow will allow you to select any of the station call signs that you added earlier during the setup. The second drop down window will allow you to see the frequencies used by the selected station. Some TNCs with Computer-Assisted-Tuning (CAT) control will actually tune your radio to the selected frequency. You are now ready to connect.

A6-5.1.3.   As you move your cursor across the "Green Light" connect button you will notice it change to the "Yellow" caution or "Yield" sign to remind you listen for a clear frequency before transmitting. If you do not connect with a few seconds, click on the "Red Stop Sign". Within a few seconds, your station will send a disconnect command and transmit your call sign.

A6-5.1.4.   If you are using the "Handshake" mode, once connected, you station will send a "QTC" or traffic count to the other station. You will also receive a QTC for any traffic pending for your station. At that point the software will send and receive any pending traffic and automatically disconnect when all traffic has been passed.

A6-5.1.5.   At this point you may shut down the [Terminal] window and then go back to the [Message Index] window to read any of the new traffic that was downloaded. It will be highlighted with a bright red "New" flag and your sent traffic will now reflect a "Green Check Mark" to show it has been transmitted.

A6-5.2.   Advanced Airmail Topics. As you become more familiar with the program you may decide to edit the MARS "System.MARS.INI" file. The file should be edited with an ASCII text editor such as Notepad. It will automate a couple functions used in the Terminal Window.

A6-5.2.1.   The first section of the .INI file is called the "Frequency Setup" and allows you to select the stations that will appear in the second tool bar window across the top of the screen. You should already be familiar with the Green Light/Yellow Light/Red Light features, the automatic (Handshake), and manual (Keyboard) buttons on the top left. After you have created and stored a "SYSTEM.MARS.INI" file, you will have a couple different options to choose from.

A6-5.2.1.1.   You already had the option to choose a station from a window pull down, what station you wanted to connect to in the MARS INI file, your regular MARS MMCS connections will be there to select from.

A6-5.2.1.2.   The line titled "Selected=" allows you to add additional MARS MMCS station identifiers. The examples below demonstrate this flexibility and include an Air Force MARS BBS.

> [Frequency Setup]
> Display Center=1
> List Center=1

Selected=AFD2MC,AFA#CX,AFA#SW,AFA#UK
File(s)=C:\Program files\Airmail\FreqLst0.rtf
List Date=2004/10/20 02:29:42

"Station Info" simply identifies your home station call sign and the grid square it is located in. [Station Info] AFD4MC=DM41:-;

A6-5.2.1.3.   The information shown in the "Frequency List" shows what items are available in the Frequency pull down window. Caution, the frequency you type in here should reflect the assigned frequency, not the dial frequency. Here's why – during setup, you identified in the Airmail Options which TNC you were using and what center frequency you were going to use. For example, if you are using an SCS TNC, you are probably using the 1400/1600 tone pair and the standard 1.5 kHz offset. That means you have selected the center frequency of 1500 (1.5 kHz) offset. The reason this is important, or not, is that if you are using a TNC that can tune your radio such as the SCS PTC II Pro and a radio that supports this feature, the TNC will automatically tune your radio for the appropriate offset based on the information you enter here in the Frequency List. If you are not using one of the SCS TNCs then you may want to simply use the dial frequency that you normally use for your particular TNC. That is your choice. As you can see by the example below, we have chosen to select the dial frequencies used for the 1.5 kHz offset for the SCS PTC-IIe TNC.

(Frequency List – designators)
AFD3MC= TPA, TPE, TPK
AFD4MC= TPB
AFA#LK= RH
AFA#HW= TPK
AFA#JS= TPF

A6-5.2.2.   This final section includes some final personal information. The call sign is self-explanatory and should be the one you are using for your home station. The Answerback is basically the PROSIGN DE (THIS IS) followed again by your call sign.

[Settings]
Call sign=AFA#NN
Answerback=DE AFA#NN
Selcall=N/A
Modes=PACTOR,PACKET
Protocol Level=1
Monitoring Enabled=1

Attachment 6-6

Common Digital Abbreviations/Acronyms

Abbreviation/Acronym	Definition
AARS	Army Auxiliary Radio System
ACP	Allied Communications Protocol
ALC	Automatic Level Control
AMTOR	Amateur Teletype Over Radio
ANCS	Alternate Net Control Station
ARQ	Automatic Repeat reQuest
ARRL	American Radio Relay League
AX.25	Amateur radio version of X.25 packet radio protocol
ALE	Automatic Link Establishment
ASCII	American Standard Code for Information Interchange
BBS	Bulletin Board System
BDCST	Mars Broadcast
CAM	Chief Army MARS
CAT	Computer Assisted Tuning
CIO	Army Command Information Office
CONUS	CONtinental United States
CW	Continuous Wave, nickname for Morse Code
DoD	Department of Defense
DPSK	Differential Phase Shift Keying
EAMC	ARMY Eastern Area MARS Coordinator
ECOM	Emergency Communications
EOM	End Of Message
FCC	Federal Communications Commission
FEC	Forward Error Correction
FED-STD	Federal Standard
FEMA	Federal Emergency Management Agency
FSK	Frequency Shift Keying
G-TOR	Golay Teletype Over Radio
HF	High Frequency
IA	Army Information Assurance
ISA	Older standard for computer circuit card interface
MARS	Military Affiliate Radio System
MBX	Mailbox (BBS System)
MBO	Mailbox (BBS System)
MILSTD	Military Standard
MFSK-16	Multi Frequency Shift Keying
MMC	Multi Mode Controller
MMCS	MARS Message Center System
MSYS	Name of Digital BBS Software
NCS	Net Control Station
NTIA	National Telecommunications and Information Administration

Abbreviation/Acronym   Definition
NTS ....National Traffic System
PACTOR...........................PACket Teletype Over Radio
PSK ....Phase Shift Keying
PTT ....Push To Talk
RATT ....Radio TeleType
RI......................................Routing Indicator
RTTY ....Radio TeleTYpe
SCS ....Special Communications Systems
SELCALL ....Selective Call (Associated with AMTOR)
SHARES ....SHAred RESources
TAPR ....Tucson Amateur Packet Radio
TNC.................................Terminal Node Controller
VHF..................................Very High Frequency
VOX.................................Voice Operated Relay
WAMC.............................Army Western Area MARS Coordinator

It must be remembered that all USAF MARS nets (voice and digital) are DIRECTED nets and must have an NCS in attendance during the net session.

(Automated digital nets excepted).

Section VII

National HF Voice (TRANSCON)

Operations Guide

1 March 2006

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TRANSCON Operations Guide

By

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TRANSCON Manager

7-1.   PREREQUISITE TRAINING. On-the-Air Training—Operating as an Alternate or Assistant Net Control on the TRANSCON HF Voice Net with an experienced TRANSCON Net Control Station Operator

7-2.   DOCUMENTATION. Trainees and instructors must have the documentation listed below, including all updates.

   7-2.1. USAF/MARS Operating Instructions

   7-2.2. USAF/MARS National Emergency Communications Plan

   7-2.3. USAF/MARS National Training Plan

7-3.   GOALS AND OBJECTIVES.

   7-3.1. Net Control Station operators are vital to the successful execution of the USAF/MARS mission.

   7-3.2. USAF/MARS is in business to handle messages. Whether the messages are priority emergency traffic, MARSgrams, or routine training traffic, our job is to process messages as expeditiously as possible.

   7-3.3. USAF/MARS Net Control Station Operators must be able to:

      7-3.3.1.   Serve as a model for MARS members to emulate in all aspects of MARS operations

      7-3.3.2.   Open and close nets

      7-3.3.3.   Direct traffic flow

      7-3.3.4.   Take a Minimum of One Two Hour NCS Session per Week

   7-3.4. In order to successfully complete this Net Control Station training, the trainee must demonstrate on-the-air ability to:

      7-3.4.1.   Open a net on time and on frequency

      7-3.4.2.   Acknowledge check-ins and list traffic

7-3.4.3.   Process all traffic listed on the net

7-3.4.4.   Conduct other net business

7-3.4.5.   Close the net

7-4.   NET CONTROL STATION (NCS) REQUIREMENTS.

7-4.1. Aspirant Net Control Station (NCS) Operators must be willing to serve and commit the time and effort to run a two hour Net Control Session.

7-4.2. Aspirant NCS Operators must have a Personal Computer and an E- Mail Account capable of sending and receiving attachments.

7-4.3. New Net Control Station Operators must acquire and learn how to use the "MARSTIME" program for reporting Station Participation Times. Our NCS roster and participation has increased to the point that we have to use it for reporting. The Net Manager and Deputy Net Manager do not have the time to continue typing in the participation times manually for Net Control Stations. Using "MARS TIME" only takes a few keystrokes to create the necessary Participation Reports to accomplish this in a few seconds.

7-4.4. For training purposes an Aspirant Net Control Station (NCS) Operator should serve as Alternate to an experienced NCS Operator until the experienced NCS Operator feels that the Aspirant NCS Operator is ready to assume the duties of a Primary Net Control Station Operator. Also, the Aspirant NCS Operator should also feel comfortable enough to take on the duties of a Primary Net Control Station Operator.

7-4.5. Alternate Net Control Station (ANCS) Operators should be as far away from their Primary Net Control Station (NCS) Operators as necessary to maintain Continuous or Near-Continuous Communications between them. The preferred propagation between the Primary and Alternate Net Control Stations is Good & Readable to Loud & Clear; however, with propagation being what it is currently, fades to Weak & Readable will be adequate.

7-5.   ALTERNATE NET CONTROL STATION (ANCS) OR MONITOR STATION REQUIREMENTS.

7-5.1. USAF/MARS Operators serving strictly as Alternate Net Control Station (ANCS) Operators or TRANS CON Monitor Station (MONSTA) Operators will not be required to use MARSTIME for Net Participation Reports; however, they will be required/requested to send E-Mail Reports to their Primary Net Control Station (NCS) Operators for whom they are filling in or to the Deputy TRANSCON Net Manager.

7-5.1.1.   These E-Mail Reports will include the Station Call Sign, State, Inclusive Times/Total Participation Time along with the Date and NCS Session Times

7-5.1.2.   The Primary Net Control Station (NCS) Operator or Deputy TRANSCON Net Manager will then be responsible for including these Participation Times with his/her own Monthly Report to the Net Manager and Deputy Net Manager.

7-5.2.   Army MARS and/or Navy/Marine Corps MARS Operators who serve as Alternate Net Control Station (ANCS) Operators and who lose contact with the Primary Net Control Station during a particular NCS Net Session will be "requested" to send the same information to the Primary Net Control Station as indicated in Paragraph 1 a above.

7-6.   NET CONTROL STATION DUTIES AND RESPONSIBILITIES.

7-6.1.   Open and close nets on the correct frequency, at the scheduled times.

7-6.2.   Direct network activities in accordance with published USAF/MARS operational requirements.

7-6.3.   Initiate and terminate radio silence, as required.

7-6.4.   Limit transmissions to essential length.

7-6.5.   Expeditiously clear all traffic in the net.

7-6.6.   Resolve disputes incident to traffic handling and net procedures.

7-6.7.   Correct procedural discrepancies.

7-6.8.   As necessary, identify stations with email capability and directing actual incident EEI reports to these stations for immediate relay to the National ECOM Manager and/or the Director of Military Support (DOMS)

7-6.9.   Maintain a complete and accurate station log.

7-6.10. Submit Net Participation Reports to the Net Manager and Deputy Net Manager by E-Mail.

7-7.   NET SESSION TIMES AND FREQUENCIES.

7-7.1.   The TRANSCON voice net operating hours are from 1300Z through 2300Z Monday through Friday and 1700Z through 2100Z on Saturday and Sunday net control station sessions are all two hour sessions; except, on Thursdays there is a four hour session (1700-2100Z) and on Fridays there are two three hour sessions (1500-1800Z; 1800-2100Z).

7-7.2.   Extended Hours (after 2300Z and before 1300Z) are on an "as needed" basis during emergency situations (such as the Hurricane Season).

7-7.3.   TRANSCON Net Sessions start at one minute past the hour and end at 59 minutes past the hour for the specific Net Control Session. For Example, the 1300-1 500Z Session begins at 1 301Z and ends at 1459Z; the 2100-2300Z Session begins at 2101Z and ends at 2259Z; etc.

7-7.4.   TRANSCON Voice Nets are used for traffic, emergencies, and exercises.

7-7.5.   TRANSCON HF Voice Net Frequencies are shown in the USAF/MARS

Frequency Listing that is available from your State MARS Director.

7-8.   NETWORK OPERATIONS.

7-8.1.   All TRANSCON Nets will be operated as directed nets, under the control of a Net Control Station (NCS). There will no "free" nets or "free" time on any AF MARS net.

7-8.2.   A Net Control Station is a station in a radio net designated to control traffic and be responsible for circuit discipline within a given net and will be available continously thoughout the net.

7-8.3.   Only MARS business is to be conducted on MARS nets. Our primary business is message handling, and that takes precedence over all other activities.

7-8.4.   Full call signs for both the net control station and net members are to be spoken phonetically on initial calls. Abbreviated call signs are not authorized.

7-8.5.   Addressing net members by name, after contact is established using full call signs, is not authorized.

7-9.   NET CALLS AND RADIO CHECKS.

7-9.1.   Net Control Stations should make a Net Call for Additional Stations to check into the TRANSCON Voice Net at least every Ten Minutes.

7-9.2.   Net Control Stations should make Roll Call/Radio Checks every thirty minutes during their Net Sessions.

7-9.3.   Alternate NCS Operators may also make Net Calls at the direction of the Primary Net Control Station and/or assist in the Roll Call/Radio Checks.

7-9.4.   By Prior Agreement with the Primary Net Control Station Operator, *regularly scheduled* Alternate Net Control Station Operators may also make periodic Net Calls for Net Control.

7-10.   STATION LOGS.

7-10.1.   All MARS stations are required to keep a station log.

7-10.2.   It is particularly important for NCS operators to keep complete and accurate station logs so that monthly Net Participation Reports can be submitted to the Net Manager and Deputy Net Manager.

7-11.   ESTABLISHING A NET SESSION.

7-11.1.   TRANSCON, TRANSCON, this is (Your Personal MARS Call Sign). Is there a Frequency Monitor Present? Over. (If a FYMON is present, have the FYMON set the frequency and continue).

7-11.2.   TRANSCON, TRANSCON, this is (Your Personal MARS Call Sign), located (in or near the closest Metropolitan Area, Your State). A Thirty Second Clear Period Follows for Transmitter Adjustmen, OUT. Please Tune to my count: ONE TWO, TREE, FOUR, FIFE, SIX, SEVEN,EIGHT, NINER, ZERO, OUT.

7-11.3.   TRANSCON, TRANSCON, this is (Your Personal MARS Call Sign), Net Control Station for the (insert the inclusive times: 1300-1 500Z, 1500-1 700Z, 1500-1 800Z, 1 700-1900Z, 1700-21 00Z. 1800-2100Z, 1900-2100Z, 2100-2300Z, etc.) Session of the TRANSCON HF Voice Net.

This is a Directed Net and Stations will not transmit unless otherwise directed by the Net Control Station or his Alternate.

All Stations Wait. Out.

7-11.4.   TRANSCON, TRANSCON, this is (YOUR PERSONAL MARS CALL SIGN). Are there any Stations with PRIORITY Traffic? Over.

7-11.5.   TRANSCON, TRANSCON, this is (YOUR PERSONAL MARS CALL SIGN). Are there any Stations operating on EMERGENCY Power? Over.

7-11.6.   TRANSCON, TRANSCON, this is (YOUR PERSONAL MARS CALL SIGN). Are there any Mobile Stations to enter the Net? Over.

7-11.7.   If this is the First NCS Session of the Day, skip to Paragraph "8)", otherwise continue with 7a).

7-11.7.1.   TRANSCON, TRANSCON, this is (YOUR PERSONAL MARS CALL SIGN). Stations continuing in the net from the Previous Session, please give your Call Sign, State, and list your traffic. Over.

7-11.7.2.   TRANSCON, TRANSCON, this is (YOUR PERSONAL MARS CALL SIGN). Additional Stations to enter the net with or without Traffic, please give your Call Sign, State, and list your traffic. Over.

7-11.7.3.   Go to Paragraph 7-11.9.

7-11.8.   TRANSCON, TRANSCON, this is (YOUR PERSONAL MARS CALL SIGN). Stations to enter the net with or without Traffic, please give your Call Sign, State, and list your traffic, OVER.

7-11.9.   TRANSCON, TRANSCON, this is (YOUR PERSONAL MARS CALL SIGN). Are there any relays for stations wishing to check into the Net? Over.

7-11.10.   TRANSCON, TRANSCON, this is (YOUR PERSONAL MARS CALL SIGN). No Stations Heard. We have No Traffic Listed. Out.

Note: The TRANSCON Net Preamble is available as a separate document upon request.

7-12. LISTING CHECK-INS AND TRAFFIC.

7-12.1.   Stations check into the net call in random order by transmitting THIS IS followed by a pause to ensure they are not interfering with another station, then transmit their call sign and state, list their traffic, and then say the proword OVER.

Example:

THIS IS <pause> AFA#LE, PENNSYLVANIA, NO TRAFFIC. OVER

THIS IS <pause> AFA#ZX, FLORIDA, ONE ROUTINE REGION ONE. OVER

THIS IS <pause> AFA#CU, TEXAS, NO TRAFFIC OVER

THIS IS <pause> AFA#LL, MISSISSIPPI, ONE ROUTINE FOR ROSWELL, NEW MEXICO. OVER THIS IS <pause> AFA#PF, CALIFORNIA, REQUEST INFORMAL WITH AFA#CU. OVER THIS IS <pause> AGA2PA, FLORIDA. NO TRAFFIC. OVER

THIS IS <pause> AFA#MM. OVER.

7-12.2.   Net Control Station, AFA#DT, now calls the net to inform all stations that their transmissions have been heard and that their traffic, if any, has been listed.

Example:

TRANSCON, TRANSCON THIS IS AFA#DT. ROGER THE FOLLOWING STATIONS: AFA#LE; AFA#ZX, AFA#CU, AFA#LL, AFA#PF, AGA2PA. AFA#MM. OUT.

When members initially check into the net, they must always identify their traffic status if any.

7-12.3.   If a member checks in and fails to identify his/her state, the NCS will request that information by transmitting: <Member station call sign>, this is <NCS call sign>. List your state. Over.

Example:

AFA#MM, THIS IS AFA#DT. PLEASE GIVE

YOUR STATE , OVER AFA#MM would then

answer:

THIS IS <pause> AFA#MM, NEW YORK. OVER

NCS would respond:

ROGER, AFA#MM, NEW YORK, OUT.

> Note: When Military Base Stations check into the TRANSCON HF Voice Net, the NCS should get the personal USAF/MARS Call Sign of the Station Operator for Participation Reporting. (If the operator is an affiliate).

7-12.4.   Once initial check-ins have been completed, the NCS may ask for additional check-ins and/or relays. For example:

> TRANSCON, TRANSCON, THIS IS AFA#DT. ARE THERE ANY OTHER STATIONS THAT HAVE NOT BEEN RECOGNIZED OR ARE THERE ANY RELAYS FOR STATIONS CHECKING INTO THE NET? OVER.

7-12.5.   If a station attempts to check into the net and is not clearly heard or recognized by the NCS, the NCS will transmit the most appropriate of the following examples:

> TRANSCON, TRANSCON, THIS IS AFA#DT, CONFIRM YOUR CALL SIGN AS AFA#ES, OVER.

> TRANSCON, TRANSCON, THIS IS AFA#DT, UNKNOWN STATION, PLEASE SAY AGAIN, OVER.

> TRANSCON, TRANSCON, THIS IS AFA#DT, STATION WITH CALL SIGN AFA#?? PLEASE SAY AGAIN YOUR CALL, OVER.

> TRANSCON, TRANSCON, THIS IS AFA#DT, PLEASE REPEAT TWICE YOUR CALL SIGN, OVER.

7-12.6.   When the NCS cannot copy (hear) a station or stations, the NCS may ask for a relay.

> Examples:

> TRANSCON, TRANSCON, THIS IS AFA#DT, STATION NOT HEARD, MAY I HAVE A RELAY? OVER

> If a station is capable of providing a relay(s), then the relay station will say, for example: THIS IS AFA#CU, RELAY, OVER.

> The NCS will reply: AFA#CU, THIS IS AFA#DT, YOUR RELAY PLEASE, OVER

> The relay station will give the call sign of the station(s) he heard by saying THIS IS AFA#CU, I RELAY INTO THE NET AFA#ES, ARIZONA, OVER

After all relays are provided, the NCS will say:

THIS IS AFA#DT, ROGER BY RELAY AFA#ES, ARIZONA, OUT

Once stations are acknowledged and checked-in to the net, they are required to obtain NCS approval and directions to relay traffic, contact other stations, move to an alternate frequency or close their stations.

7-13. ALTERNATE NET CONTROL STATION (ANCS). Immediately following initial check-ins, the NCS may assign an ANCS, if needed. If an ANCS has not been scheduled prior to the net, the NCS should appoint an Alternate NCS before any net business is conducted. If possible, the ANCS should be at a different geographical location than the NCS. The ANCS should be prepared to assume control of the net as directed by the NCS, or automatically, if the NCS is unable to continue due to technical difficulty or propagation conditions. The ANCS will remain operational until the net is closed or until released by the Primary Net Control Station.

7-14. MONITOR STATIONS (MONSTA). Some USAF/MARS, Army MARS, and Navy-Marine Corps MARS stations regularly monitor the TRANSCON Calling Frequency (TVE) during the day when TRANS CON Net Sessions are scheduled. When the scheduled Net Control Station is not on-the-air or is not readable and an Alternate Net Control Station has not picked up the Net, TRANSCON Monitor Stations may make note of MARS Stations who attempt to check into the net and should contact with those stations. The TRANSCON Monitor Stations will then record the stations checking in along with their inclusive participation times and send EMAIL Reports to the TRANSCON National HF Voice Net Manager and Deputy Net Manager for inclusion in their Monthly Participation Reports.

7-15. CLEARING TRAFFIC

7-15.1.   All TRANSCON National HF Voice Nets are established as formal, directed nets. Informal contacts between net members can be listed when checking-in or at any time during the net. Informal contacts are not allowed during the formal traffic-handling portion of the net. Informal contacts will be handled only after all traffic and training is completed. Contacts, whether formal or informal, are limited to MARS matters and are limited to five minutes.

7-15.2.   When all check-ins have been acknowledged and traffic listed, the NCS operator will commence to clear traffic in order of precedence and time of listing. Traffic is cleared in the following order:

7-15.3.   Priority ("P")—such as Actual Event EEI Reports or other Priority or Higher Precedence Messages Routine ("R")—such as Exercise EEI Reports and Morale & Welfare MARS GRAM Messages

Example:

AFA#ZX, this is AFA#DT, call AFA#LE for Radio Check. OUT.

After AFA#ZX gets a favorable Readability Check from AFA#LE, Net Control AFA#DT will send the two stations to the Traffic Frequency (TVF), as follows:

AFA#ZX, this is AFA#DT, Net Control Station. Please change to TVF to pass traffic to AFA#LE. Out.

Both AFA#ZX and AFA#LE change to frequency TVF. The two stations check readability on TVF and, if favorable, AFA#ZX passes his traffic to AFA#LE. After passing the traffic, both stations report back to the Net Control Station on the Calling Frequency (TVE).

AFA#DT, this is AFA#LE back on frequency. Over.

AFA#DT, this is AFA#ZX back on frequency. Traffic complete. Over.

Net Control Station AFA#DT will then acknowledge the two stations back on frequency and that the traffic is complete. The Net Control station will also clear the other traffic by sending the appropriate stations to the Traffic Frequency (TVF) to pass the traffic or instruct them to send the traffic on the Calling Frequency (TVE). If the traffic load is light or if readability conditions are poor, the Net Control Station may have the traffic handled on the Calling Frequency.

7-16. BULLETIN MESSAGES

7-16.1.   Electronic Mail (E-Mail) and Digital Radio (TRANSCON Pactor Net) are the preferred modes for distributing TRANSCON Voice & Digital Bulletins and ECOM Bulletins from the National Net Managers (AFN3AT—TRANSCON Digital; AFN4VN—TRANSCON Voice; and AFN1EC—ECOM Bulletins) to the USAF/MARS Members. However, when appropriate, these Bulletins are also to be read on TRANSCON HF Voice Frequencies during regularly scheduled TRANSCON Net Sessions,

7-16.2.   If bulletins are read (at reading speed) over the TRANSCON Voice Net, it should not be necessary for stations to individually acknowledge them. The station reading the bulletins should ask if anyone needs fills.

> Example: "THIS IS (sender call sign), DOES ANY STATION NEED FILLS, OVER?" The word "Fills" is an abbreviated way to ask if anyone needs the NCS to "fill in" what the member did not copy in the transmission. Asking only for fills will save time needed for training, passing traffic and providing other information on the nets. The NCS does not necessarily give the fills. The station sending the message or giving the information would give the fills.

7-16.3.   There may be times, such as during emergency operations, when bulletins must be copied. In this case the message will be read at copying speed, as with any other traffic message

7-17.   CLOSING NETS. The NCS will close the net session by transmitting the following:

    7-17.1.   TRANSCON, TRANSCON, this is <NCS Call Sign>, this session of the TRANSCON Voice Net is closed, OUT.

        Example:

        TRANSCON, TRANSCON, THIS IS AFA#CU. THIS SESSION OF THE TRANSCON VOICE NET IS CLOSED, OUT. TRANSCON, TRANSCON, THIS IS AFA#DT, THE NET IS CLOSED, OUT. (By ANCS).

This document contains one for one page replacements for the 1 Mar 2006 MARS Training Manual that incorporates recent Air Force MARS National Emergency Plan process changes for Essential Elements of Information message handling. Remove and insert pages of the 1 Mar 2006 MARS Training Manual as outlined below.

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