

U.S.A.F.
MILITARY AFFILIATE RADIO SYSTEM

MARS
REGION 2
PACKET OPERATIONS
DIRECTIVES

[Reissued as Interim Information by Ken Heitner, AFF2K]

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1 PURPOSE

To provide guidance to comply with established policy, technical standards and procedures for use of the packet radio mode on USAF MARS Region 2 frequencies. If procedures described below do not cover a specific operation requirement, initiative then common sense should prevail.

2 BACKGROUND

Packet radio is a digital information transfer mode which uses error correction mechanisms to provide the recipient with error free information (data). Packet radio message store and forward offers many advantages over other digital modes. It is the only mode available requiring no operator to be present and operations are automatically selective addressable out of a given geographical area beyond propagation characteristics by use of the MARS frequencies to support the primary MARS mission of emergency/contingency communications in a backup role for active duty means of transmissions. Packet radio may be used to handle third party morale/welfare traffic when not required for the primary stations and affiliate members with the exception that affiliates holding Novice Class FCC licenses are restricted to VHF operations only except for HF training nets. Affiliate operations are supervised by a national packet coordinator who is appointed by Chief, USAF MARS. The region 2 Packet Manager is AFF2K.

3 TECHNICAL STANDARDS

3.1 GENERAL:

Packet mode operations will be restricted to frequencies designated by the Chief, USAF MARS, and the Region 2 Packet Manager. The widely accepted AX.25 packet protocol will be utilized in normal day to day operations. Other protocols may be used on TVRS frequencies for developmental purposes. Attachment 1 is provided for suggested parameter settings. Attachment 2 is provided to explain frequency setting for your HF and VHF radio and the TNC you have chosen to use.

3.2 HF:

HF operations will utilize 200 Hz shift, NRZI at 300 BPS (BAUD) with tones suitable to the particular equipment being used. Transmitter modulation techniques will insure that the mark and space frequencies are as close in amplitude as possible and straddle the assigned frequency.

3.3 VHF:

VHF operations will utilize 1000 Hz shift, NRZI at 1200 bits per second and modulation will be accomplished using tone modulated frequency modulation (16K00F2D). Packet operations on AF VHF frequencies are limited to those assigned. The Region 2 preferred Packet TEXN frequency is specifically assigned to US Army MARS Program under the administration of the US ARMY Eastern Area MARS Director. Packet is specifically prohibited from the voice repeater Frequencies. Deviation (modulation) levels shall not exceed +/- 3.5 kHz. Modulating tones shall be sinusoidal and in conformance with the Bell 202 modem standard of 1200/2200Hz and will be balanced so as to create an equal amount of deviation for each tone. Other protocols may be used for developmental purposes.

3.4 SOFTWARE SPECIFICATIONS:

(1)TERMINAL SOFTWARE

Several types of terminal software are available to USAF MARS packet participants. There is no prescribed software for the individual member.

(2) FIRMWARE

The standard TNC firmware for 95% of all packet activity is provided by the Tucson Amateur Packet Radio (TAPR) group. The only suggested criteria is that whatever software is used be able to provide hardcopy from your printer so that a permanent copy of record traffic can be maintained. It is highly recommended that firmware that can support message storing, for example personal mailboxes, that have battery back up or writing to disk as received be used.

(3) BULLETIN BOARD SOFTWARE

USAF MARS BBS/Mailbox software has tended toward conformity with the standards of the Defense Data Network (DDN) and TCP/IP protocols. There is no mandate to use a particular BBS program as long as it supports as a minimum FBB or RLI style forwarding and 90 day archiving of messages. Compressed forwarding is preferred (either FBB or RLI) to help throughput on HF. Most USAF MARS Region 2 Mailbox system operators have adopted MSYS as the software of choice. Any of the acceptable software is available at no charge through the existing membership. A discussion on the BBS commands and briefly how they work is provided in attachment 3. The following are examples of software that are acceptable:

FBB
MSYS
PRMBS

4 PROCEDURES

4.1 CALLSIGNS:

(1) The following chart of Secondary Station Identifiers (SSID) currently apply to USAF MARS packet station operations but changes may be made as required upon coordination with the National Packet Coordinator. Additional SSIDs may be added or the foregoing definitions revised as the packet network develops and additional requirements arise.

-0 (no SSID)	Standard keyboard operation from assigned station location.
-1	Authorized HF Packet Bulletin Board systems (BBS) / Mailboxes.
-2	Authorized unattended digipeaters located at licensed MARS station locations that other than those on government installations or remotely located stand alone digipeaters which bear a distinctive callsign.
-3	See paragraph 4.A(2) below
-4	Authorized VHF packet Bulletin Board systems (PBBS) / Mailboxes. TNC Personnel mailboxes with battery backup can be end receivers for message traffic.

- 5 Authorized NET/ROM or nodes system co-located with a licensed MARS station other than a station on a government installation or stand alone system.
- 6, -7, -8 Multi-port node software where needed.
- 9 This SSID is to be used for mobile or portable operation only.
- 10, -11, -12, -13, -14 Alternate callsigns
- 15 This SSID is used only for personal PBBS maildrops where there is either battery backup or direct writes to disk media. Third party or record backup. Third party or traffic can be auto type of PBBS, and time credit given.
- (2) Digipeaters are to use a 3 character alias preferably the FAA identifier for the location. Gateway alias are to be the digi alias plus 3 (i.e. FLL3).

4.2 MESSAGE FORMAT:

All formal traffic entered into the packet network will be accomplished in the following additions. Examples are provided in attachment 4.

- (1) All entries will be made in upper case letters.
- (2) When entering traffic into the Region 2 packet system, for Region 2 destined locations it is not necessary to subject field as suggested by TVRS management. It is necessary to put complete phone number (area code, etc.) for traffic destined outside the region 2 area. All MARS members know their local calling area and entering the area code and first three numbers is unnecessary work when entering large volumes of traffic into the system

4.3 RESPONSIBILITY FOR TRAFFIC:

The responsibility for traffic placed onto the packet network rests with each of the sysop of the mailboxes onto which the traffic is placed or relayed. It is expected that every sysop will exercise due diligence to see that the traffic is relayed. If it is not relayed to another packet mailbox, the traffic will be refiled into another mode either directly on a

TRANSCON frequency or via the sysop region network to an appropriate TRANSCON network. In any case the MARS station, whether it be the sysop or a mailbox user will delete the traffic using the KT or K (depending on the BBS system) command to avoid duplication deliverable unless its destination is local to the station removing the traffic and there is a valid reason for it being undeliverable, such as addressee having moved and/or it cannot be mailed, etc.

4.4 RECEIVING TRAFFIC:

Receiving USAF MARS Formal packet traffic is easy. Make sure you check into your local BBS regularly. Each time you check in, type "L" or "LT" to check for any traffic that you can handle. If you can handle it, read it, print it locally and deliver it or relay it by another mode. Now most importantly, "KT" it to remove it from the BBS to prevent duplication of delivery. Sending QSL messages to the originating station is a requirement which has been deleted. We have found that QSL messages did more to clog the system than anything else.

4.5 TEXN:

TEXN is authorized on the Region 2 HF packet frequency. The TEXN guidelines must be strictly adhered to, i.e. TEXN stations may pass interstate traffic only and no beaconing of BBS operation is permitted. TEXN stations will pass their traffic and leave the frequency. This authorization is for Region 2 ONLY and does not extend to the TVRS packet system. TEXN traffic should be accepted exactly as sent in the format of the sending service, and no changes made except to addressing or headers to facilitate handling. Note: Requests to change formats from and to either service for valid reasons will be considered on an individual case by case basis for reasons of expediting traffic through the TEXN system.

4.6 HF KEYBOARD OPERATION:

Unproto digipeating is prohibited on HF and VHF. Stations not adhering to this will be locked out of all bulletin boards.

5 PACKET TRAFFIC SYSTEM NETWORK

The packet traffic system network for Region 2 is a multilayered system to allow maximum participation and maximum traffic throughput. The system consists of TVRS BBS, Region BBS, Local Area BBS, and Local user layers. The TVRS BBS receives the traffic and relays it to the region BBS's, which in turn relays the traffic to the Local area BBS's. The local user (such as affiliates with PBBS) receive the traffic from the Local area BBS and either deliver the traffic

directly or transfer it to the other mode nets for final destinations. The local user utilizes this same system to input traffic into the system to be delivered to the appropriate area. Each system BBS that is used to forward the traffic has “forwarding files” which automatically forward the traffic to the appropriate Region, State and Local Area. The Region 2 HF Packet Bulletin Boards list is provided as attachment 5. VHF switches, nodes and digipeaters must have the SMD or the State VHF Packet Manager concurrence prior to bringing a system on line to the State VHF Packet Traffic System.

6 TIME RECORDING

A. HF:

All major BBS’s within Region 2 will report participation time of their and of all sign on stations to AFF2K utilizing CONTIME.EXE by the fourth day of a new reporting quarter for the preceding quarter. (Send your BBS.TME file only).

ATTACHMENT 1: PARAMETER SETTINGS

The first thing that should be accomplished is to become familiar with the particular TNC commands and the particular requirements for your setup. The values stored in your TNC’s EPROM’s are totally unsuitable for HF packet operation, they are tailored for the average VHF case. Here is a set of recommended “non-default” parameter values for USAF MARS packet operation.

MAXFRAME 1 TO 2
PACLEN 32, 64, OR 80
TXDELAY 40 OR 50
FRACK 6, 7, OR 8

MAXFRAME:

Choose a lower setting for poor conditions, a higher value for better conditions. If you send four frames in one packet and the distant station ACKs only frame #1, then you’re going to resend frames #2, #3, and #4. If he ACKs frames #2, #3 and #4 OK bombs out #1, you’re going to resend all four of them again anyway. What’s the point in cluttering the channel with two, three or four unACK’ed frames when the first one hasn’t been accepted?

Each frame imposes a fixed “overhead” on the packet. This “overhead” is the synchronization, timing, clocking, control and address information stuff that you don’t type” the stuff that makes the protocol work. The simplest frame you can send has at least 19 bytes (152 bits) of overhead. Each bit of each BYTE is tested by the error correction process.

Unless you have a definite need to maintain a specific document format, don’t waste bandwidth inserting blank lines because you think it may “look good” on the other stations screen. If you’re operating in the CONVERSE mode as most people tend to do, your packet frame is actually sent by the CARRIAGE RETURN or ENTER key.

That single CR/LF you type to make a blank line creates a frame that has exactly the same overhead as a frame that has 80 typed characters. This “overhead” is the packet protocol stuff like the sync, callsigns and control information – stuff that you don’t see that conveys no “user” information. Every blank line must be ACK’ed just the same as the fully typed lines (It hurts to see a link time out retrying a blank line).

PACLEN:

Choose a lower setting for poor conditions, a higher value for better conditions. This is the number of typed characters that makes ONE frame. The lower the number of typed characters that makes ONE

frame, the lower the number of characters or BYTES in frame. The higher the mathematical probabilities of getting through without taking a hit.

Each byte in the overhead mentioned above has eight bits. Each of the characters you type has eight bits. If any one of those bits in any one of those overhead bytes (or in your typed characters) takes a noise hit, then the error correction process fail, and the whole frame is thrown away. Let's say that AFF2N is directly connected to AFF2K and sends the simple line:

Hello Bud how are ya

That small packet frame actually consists of at least 20 bytes (160 bits) of overhead, plus 27 bytes (216 bits) of your typed data, a total of 376 bits. If any one of those 376 individual bits is trashed at any point in the link during transmission, then the entire frame is thrown away by the receiving station.

Now lets assume that you're still using the factory default value of PACLEN, 128 bytes, and that you're not typing any CR/LF so that TNC is automatically sending the packet at your 129th typed character. Your frame might look like this:

Bud, I wanted to let you know that I wouldn't be able to go to the club meeting tomorrow night and you'll have to get a ride from

The same simple arithmetic tells us that you've just sent 20 bytes of overhead, plus 128 bytes of characters you've typed, resulting in a frame that has $20 + 128 \times 8 = 1184$ bits.

Simple common sense says that the chances of getting 1184 bits through the link "unharmd" are much lower than getting only 376 bits through without damage by the typical noisy HF radio environment. Now if you happen to be operating with the factory default settings (as your TNC is as shipped from the factory):

MAXFRAME	4
FRACK	3
PACLEN	128

Let's look at MAXFRAME first. Arithmetic tells us that you've just sent a packet of FOUR frames, each one containing 1184 bits, totaling 4736 bits. The chance of all 4736 bits surviving the journey in typical HF conditions is a wee bit small. At 300 bits per second, each bit of each BYTE (or character) has a duration of 3.3 milliseconds. You can see that it doesn't take much of a noise pulse to smear one of those many bits and there by kill an entire frame. Have you ever measured the length of a single pulse from either the "woodpecker" or your local power line noise?

FRACK

The FRACK timer sets the amount of time that your TNC will wait for ACK after the instant your PTT keys your rig. Contrary to a common misunderstanding, FRACK time is NOT counted from the end of your burst; it's counted from the beginning. Lets assume you're still using the factory supplied default values.

FRACK	3	(3 seconds)
TXDELAY	30	(300 milliseconds)

Let's say that you send our sample short line shown above:

Hello Bud how are ya

The packet frame contains 376 bits of stuff (more math):

376 bits @ 300 bits per second	= 1.25 seconds
300 milliseconds TXDELAY	= 0.40 seconds
Length of burst	= 1.57 seconds
Minus FRACK delay	= 3.00 seconds
Available response window for ACK	= 1.47 seconds

This appears to be logically possible but is it really? Is this enough time for the other station to send you the ACK you need?

The other station's TNC must send a ACK whose minimum length will be 20 bytes or 276 bits. If he's using a slightly lengthened TXDELAY (say 400 milliseconds), or if his TNC hears anything on the channel and delays the ACK for even a few hundred milliseconds, we have an interesting problem.

Let's assume that the other station's TNC received a valid frame from your system, the channel is clear, and his TNC is going to send the ACK back to you. Now we've got a very cute "catch-22" situation:

376 bits @ 300 bits per second	= 1.25 second
Distant station's TXDELAY	=0.40 second
Distant station's DWAIT	=0.32
Distant station's RESPTIME	=1.47

Total DELAY before other station's end of data is 2.47 seconds.

Remember that your system won't know if his ACK is valid until your TNC has received and decoded his entire frame. The combined delays introduced at his end now approach your FRACK time. You can't decode and validate his ACK before your FRACK timer runs out your TNC RETRIES your frame because the other station's ACK didn't arrive on time. And all this relates to his sending an ACK frame of only 20 bytes.

Now that we've had a taste of timing concepts, lets see why HF packet doesn't work and what happens if you're still using factory default values:

MAXFRAME	4
PACLEN	128
FRACK	3

Our arithmetic said that you would send a packet of four frames, each one containing 1184 bits, totaling 4736 bits.

4736 bits @ 300 bits per second	= 15.79 seconds
300 millisecond TXDELAY	= 00.30 seconds
Length of burst	= 16.09 seconds
FRACK delay	= 03.00 seconds
Available response window for ACK	= -13.09 seconds

You cannot fit a 16 second burst into a 3 second FRACK window. Your FRACK timer expires before you've finished sending the packet. This is not going to work!

Now, let's use the same arithmetic to see how our suggested values fit in here.

MAXFRAME 1 (only one un-ACK'ed frame allowed on the air)	
PACLEN 64 (64*8) + (20*8)	= 672 bits
FRACK 6 (6 seconds)	
672 bits @ 300 bits per second	= 2.24 seconds
300 milliseconds TXDELAY	= 0.30 seconds
Length of burst	= 2.54 seconds
FRACK delay	= 6.00 seconds
Available response window for ACK	= 3.46 seconds

This will work. Your single frame packet burst of 20 bytes of overhead and 64 bytes of your typed data adds up to about 2.5 seconds. About 3.5 seconds remain available as the interval during which you must receive the ACK from the other guy before your TNC will retry the Frame.

Below 28 MHz you're limited to 300 bits per second. On VHF you're using 1200 bits per second. Everything on HF takes FOUR TIMES LONGER to send, and FOUR TIMES LONGER to receive.

TXDELAY:

Don't assume that TXDELAY relates ONLY to your radio's switching times. It also relates to the switching and other timing factors in the other station's radio. In our real world of HF packet radio TXDELAY relates to the radios at both ends of the link.

Nearly all phase locked loop synthesized radios have some measurable "settling time." This delay is introduced by some PLL frequency setting systems when switching from transmit mode to receive mode and vice versa. We also note that many HF transceivers have a significant delay even with "fast AGC." This additional delay occurs while the receiver's AGC circuit is "relaxing" and returning the receiver to full sensitivity.

One more cause of delays appears when the sending station uses AFSK in the single sideband mode. Some operators are not careful to avoid driving the transmitter into ALC action.. ALC (automatic level control) tends to reduce the transmitter's power output at keyup time and, if excessive, can actually destroy the first few bytes of the transmitted packet frame. Those first bytes of each packet frame are the FLG field, the information that marks the beginning of the frame and provides timing or synchronization information to the other station's TNC. If the flag is smeared during transmission, the receiving TNC can't use that frame and throws away whatever it receives after it. In addition, the more sync you have on the front of each frame, the higher the probability that the other station's TNC will successfully decode your frame in conditions of noise and propagation effects.

Extra flag also seems to help combat the effects of multipath and selective fades. Don't fall for that "too much TXD cuts down my throughput" nonsense. If the other station doesn't decode your flag correctly, then all the bytes after the sync are trashed: the frame is thrown away. So much for your "throughput".

CARRIAGE RETURN:

- 1 Carefully check your BBS and TNC parameters to verify that no extra CR/LFs are being added.
 - A Go to terminal mode and get the cmd: prompt.
 - B Enter the following: BT Test <CTRL-v><cr>1234567890 (repeat numbers 1-0 a total of 8 times). This sets the BTEXT to contain the word "Test", followed by 80 numbered characters on a separate line.

- C Enter BT<cr>
- D If all 80 characters are displayed on one line, your auto CR is probably OK. Otherwise determine the parameter that controls this for your TNC and set to) to disable. Then retest to verify.

- 2 If you enter messages or bulletins received from other modes (i.e. RATT), read these messages after you have posted them for forwarding to insure no extra CR/LFs.

ATTACHMENT 2: Frequency Setting

In packet radio the USAF standard of maintaining frequency settings to within +/- 10 Hz of the ASSIGNED frequency will result in good interface between stations.

There are two frequencies listed, they are the DIAL and the ASSIGNED frequency. The DIAL frequency is the frequency you would read on your transceivers readout in order to assure that the intelligence on your sideband transmission is centered 1.5 KHz. This frequency 1.5 KHz up (uppersideband) from the DIAL frequency is called the ASSIGNED frequency. This is the frequency that the tones generated by the TNCs are centered.

Packet TNCs output two tones that represent a mark and space. The HF tones are 200 Hz apart (VHF 1000 Hz) regardless of the actual tones the TNC uses. Each TNC manufacturer may use different tone frequencies. For example:

<u>TNC-HF</u>	<u>LOW TONE (Hz)</u>	<u>HIGH TONE (Hz)</u>	<u>CENTER (Hz)</u>
MFJ	1600	1800	1700
PK-232	2110	2310	2210
KAM	1600	1800	1700
PACOMM	1600	1800	1700

The method for calculating the desired DIAL frequency (freq) is:

$$\begin{aligned} \text{ASSIGNED FREQ} &= \text{LSB DIAL FREQ} - \text{CENTER FREQ (TNC)} \\ \text{ASSIGNED FREQ} &= \text{USB DIAL FREQ} + \text{CENTER FREQ (TNC)} \end{aligned}$$

On VHF FM, the tones you receive are directly generated and controlled in the other station's TNC and vice-versa. Your TNC's tones are transmitted directly, unaltered, by your FM transmitter and receive unaltered by the other station's receiver. Your synthesized radio's LED frequency display tells you you're on the same frequency as the other station.

But HF packet is a different story. The tones produced by your TNC may no longer be the same tones that come out of the other station's radio. The frequency of the tones that come out of the operator tunes his receiver. Whether you and the other station are using AFSK or direct FSK, the tones from the receiver will always be determined by receiver frequency tuning.

Tuning accuracy on HF packet radio is generally more critical than in the other operating modes. Tuning errors as small as 20 Hz can result in failure to decode packets successfully. The more selective the receiver and the TNCs filters, the more the tuning accuracy. Some IF filters can be too narrow to handle data at our usual HF packet rate of 300 bits per second. In general, IF filter bandwidths should be greater than 500 Hz for packet operation at 300 bits per second.

HF packet operation also imposes greater demands for overall transmitter and receiver stability. Unless the rig can hold frequency, plus or minus 20 or 30 Hz for more than just a few minutes, you may drift right out of a useable HF link and "die" from excessive retries.

There are other interesting problems, unlike conventional Baudot, ASCII RTTY and AMTOR, packet signals use a data format called NRZI (non return to zero inverted), which in effect ignores data sense (mark space polarity). On HF packet, you can use upper sideband or lower sideband equally well. The only difference will be in the frequency shown on your rig's tuning display. You can be on USB while your link part is on LSB. Your rigs will appear to be on different frequencies. In general USAF MARS stations use USB only, except for a few split frequencies that use LSB.

To connect to a BBS or another station, you can't always go strictly by the frequency displayed by most modern HF rigs. There is no industry wide standard as to the exact meaning of the numbers shown. Some transceivers display the frequency of the suppressed carrier in SSB, some show the frequency when your rig is tuned to Mark (lower) tone. Some show tuning for space (higher) tone. Some HF rigs even provide front panel adjustments of the digital display to whatever the user wishes carrier, USB, LSB, FSK, either tone, etc.

When using AFSK, your rig's displayed frequency will literally depend on the tones being transmitted by the distant station, and also on the frequencies to which your TNC's demodulator and filters are tuned. Check your TNC and transceiver operating manuals to determine what audio tones your TNC uses for MARK and SPACE, and how your rig's digital display relates to the received and transmitted frequencies.

ATTACHMENT 3: BBS (s)

1 FORWARDING FILES

BBS software contains forwarding files which have the information necessary to effect automatic forwarding of messages from the mailbox. Pre programmed forwarding files which are setup at the installation of any traffic forwarding BBS will have specific routes to forward traffic. This allows the user to send a message to a specific location without knowing the route to be taken. These forwarding file routes are detailed and have alternate routes based on propagation paths (i.e. for day and night). The Region 2 Packet Manager (or his designee) may provide the files for the sysop. Then the only changes would be to tailor the local forwarding files to be compatible with the rest of the Region 2 files.

2 BROADCAST IDENTIFIERS:

The purpose of the broadcast identifier BID is to automatically identify bulletins messages to prevent duplications.

3 COMMAND LIST:

MSYS BBS COMMAND LIST

Abort	Stop current action
Bye	Disconnect
Conference	Multi user \DX Node
^ZH	Conference help
^ZQ or /EX	Return to
^ZU	List users
^ZA#	Invite user on #
Download	Download from FILES

Grep	String search file
Help	Help
Information	BBS hardware
ID	Port definitions
Just Heard	Log
JB	BBS Stations
JD	Digipeaters
JG	Gateways
JK	K and KA nodes
JM	MSYS PBBs
JN	Net/Rom
JT	TCP/IP protocol
Kill	Kill a message
KM	Kill mine
KT	Kill traffic
List	Message headers
Lx	List category x
LC	List Categories
LM	List mine
LN	List not read
LT	List traffic
LL #	Last message
LO #	Lost older # = yymmdd
LU	List unread to you
LY	List read to you
LW	List weather
L?	List ? forward
L<< x	List fm x = callsign
L>> x	List to x = callsign
L@ PBBS	Messages to PBBS
L x	List since #
LL #	List last #
L # #	List from # to #
L "x"	List with x = string
L 'x'	List with x = string
L\$	List bulletins
Message	Message of the day
Name	First Name
NH	Home board
NQ	QTH + City, State
NZ	Zip code
Path	Path to a user
PF	Path to a PBBS
Read	Read a message

	R x	Read all category x
	R@ xxxx	Read all at xxxx BBS
	R> xxxx	Read all to xxxx
	R< xxxx	Read all from xxxx
	RM	Read Mine
	RE	Read for export
	RH	Read with headers
	RN	Read only text
	RP	W/O mark as read
Send		Send a message
	^A	Abort message
	CC	Carbon copy
	REPLY #	Reply auto title
	SP	Send personal
	ST	Send traffic
	SB	Send bulletin
Talk		Page sysop
Users		Users
Version		Version
What		Download list
	W x	What in x = sub directory
Expert		Toggle Expert
	X #	Lines per page
	XC	Toggle category
	XF	Multiple lines
	XR	Toggle reply
Yapp		Down and uploads
	YW	YAPP Directory
	YD	Download a file
	YU	Upload a file
*		Comment to sysop

NETWORK NODE COMMANDS

BBS	Connect to the PBBS
Bye	Disconnect
Connect Call	Connect to call
C#	Con port # to call
Help	Help
Info	Basic Information
Justheard	Limited output JH
K-Nodes	K-Node output

Nodes	Nodes heard
Nodes Call	Info on node
Ports	Port information
Routes	Direct connect nodes
Route Call	Other node
Talk	Page Sysop
Users	Users/Nodes
Version (1.18)	December 1994

A brief list of commands may be obtained by entering H. A much more detailed listing of each command can be obtained by typing ?x where x is the command for which you want the detailed info. A MSYS USER manual is available from most RGN 2 BBS, or from the Packet Manager, upon request. It is also in the files section on many MSYS BBS and could be downloaded on VHF only.

ATTACHMENT 4: MESSAGE FORMAT

1 MARS PACKET FORMAL MESSAGE ENTRY

All formal traffic entered into AF MARS BBS's will be addressed as:

- 1.1 "Zip Code" where the Zip Code is the final addressee's Zip Codes. Since the PBBS command to send Formal Traffic is "ST", entering a piece of traffic for a Florida Zip of 32937 would be done by typing: ST 32937@32937.
- 1.2 The PBBS will now ask you to enter the title of the message. AFMARS formal message titles will consist of :
 - (1) The Town, a comma and the State of the Addressee.
 - (2) A Slant Bar
 - (3) The Area Code, a hyphen, and the Telephone exchange of the Addressee

(See paragraph 4.b (3), for Region 2 Traffic) For example: Satellite Beach, FL/407-773

1.3 The BBS will now ask you to enter the message. In reality, this is the complete formal message including the preamble. The following lines of UPPER CASE information are required:

- (1) DE followed by station of origin NR followed by message number.
- (2) Precedence (R, M, P, I, F) followed by Date/Time Group.
- (3) FM followed by Originator's address
- (4) Originators Area Code, Phone Number and Callsign if MARS Member.
- (5) That origination station's callsign and state, country always follows the last word of the last line of the originator's information.
- (6) TO followed by addressee's name and callsign if MARS Member.
- (7) Addressee's address (this will normally take two lines).
- (8) Addressee's Area Code, Phone Number.
- (9) BT (Break)
- (10) The formal message text typed five to ten groups per line, (This must be in any given message and depends largely on word length). Line lengths should never exceed 69 characters for ease in transferring to Teletype™ when necessary .Plan ahead.
- (11) BT (Break)
- (12) All of this is followed by a Control-Z or /EX to tell the BBS you're finished entering the message.

It is suggested that messages be entered in all UPPER CASE TYPE to facilitate transfer to conventional Baudot Radio Teletype (RATT) circuits if so required.

1.4 What follows now is an example of message entry including the prompts issued by the BBS as entry proceeds. Material enclosed in circumflexes <> are prompts supplied by BBS.

EXAMPLE OF FORMAL TRAFFIC ENTRY INTO AFMARS BBS

<AFA2FK-4->

This is the prompt from the BBS when you sign on

ST 33809@33809

The next BBS prompt

<SUBJECT>

LAKELAND FL/813-858

Enter your formal message

<MESSAGE>

DE AFA2SJ NR 32

M 051245Z MAY 98

FM LARRY S JONES

108 FOXRIDGE RUN

LONGWOOD FL 32750

407-332-5248/AFA2SJ FL

TO BUD CAMPBELL/AFA2FK

8365 N SOCRUM LOOP RD

LAKELAND FL 33809

813-858-8873

BT

THIS IS AN EXAMPLE OF AN AIR FORCE MARS MESSAGE
LIMIT EACH LINE TO 10 WORDS IF POSSIBLE AN ALTERNATE
FIVE WORDS PER LINE MESSAGES SHOULD BE LIMITED TO 50
GROUPS OR LESS BUT THIS IS NOT AN ABSOLUTE MUST
BT

^Z or /EX

This is required to let the BBS know “end of message”

!!!!THAT’S ALL THERE IS TO IT!!!!

When a station removes it from packet for delivery or relay to another mode, that station will print it and delete it using KT or K command. Read your message after entering the traffic to ensure such things as extra carriage returns and misspelling are corrected prior to the BBS forwarding the errors to the next station. If a correction is required, kill the existing message on the BBS immediately and reenter the message. Note: to read the message use the R command. If the BID number must be checked to ensure that the route to the BBS is correct or that a copy of the same message is in the system with a different BID number use the RH command to see the complete header.

1.5 For RATT operators, note the following differences in the packet format from the RATT format:

- (1) No extra blank lines preceding the beginning of the message preamble.
- (2) No extra blank lines between the first “BT” and the text of the message.
- (3) No extra blank lines between the text of the message and the second “BT”
- (4) Confirm line has been deleted.
- (5) No extra blank lines following last “BT” of message.
- (6) Machine turn off code (NNNN) has been removed. It may optionally remain.

2 MESSAGE ADDENDUM OVERSEAS

The question of how to handle message addressing for overseas locations has arisen. The technique is the same as with other zip to zip messages. The subject (or title) is simply APO NY, APO SF or APO Miami for example. If there is a local phone number it may be optionally appended but please remember that mail to APO addresses should never contain geographical information, just the official unit address. If there are further questions of this subject please consult your region training official and the MARS Operating Directives.

3 OTHER TRAFFIC

3.1 Bulletin Traffic

Bulletin traffic is information for general dissemination to the MARS members whether local area BST members or the complete MARS community. This would include the MARS broadcast, BST meetings announcements, requests for information etc. This type of traffic/message does not use the “ST” command and the subject line is subject of bulletin versus zip # zip. The format for bulletins is not required to be in the formal traffic format.

ATTACHMENT 5

REVISION FEB 98:

REGION 2 HF PACKET BULLETIN BOARDS

PACKET BBS

AFA2ER-1
AFA2EV-1
AFA2FK-1
AFA2FR-1
AFA2LF-1
AFA2MY-1
AFA2QG-1
AFA2SW-1
AFA2WM-1
AFA2ZS-1
AFA2QQ-1
AFA2QW-1

LOCATION/REMARKS

CHAPEL HILL NC (AFF2R)
MONTGOMERY AL (AFF2AL)
LAKELAND FL (AFF2K) (ALSO TVRS)
FT LAUDERDALE FL
PALM BAY FL
MIAMI FL
PORT ST. JOE FL (ALSO GTOR TVRS)
LEXINGTON KY (AFF2CP)
WARNER ROBINS GA
ALEXANDRIA VA (ALSO TVRS)
MORGANTOWN WV (AFF2WV)
COVE CITY NC

(Please note: As of 27-Jan-03, a number of these BBS stations are no longer active!)

ATTACHMENT 6: HF DIGITAL FREQUENCIES

Deleted for Internet Version.

This page can be requested by any AF MARS member from AFF2K.