

Instruction Manual

Ver.01

EJ-50U Terminal Node Controller Unit

ALINCO,INC

Thank you for purchasing this fine Alinco product. This unit enables data communication when it is properly installed in designated Alinco transceivers. Please read this manual, print the contents if necessary, and keep this disk for future reference.

Since this device is also capable of being used in commercial applications, some of the pages in this manual are intentionally left blank to accommodate those uses in other regions.

Although we attempt to explain the features of this unit in a simple and comprehensive manner, unless you have some knowledge about packet communications and APRS, you may have difficulty understanding the contents of this manual. We apologize, but Alinco cannot provide basic information on how packet and/or APRS functions in general. Please consult your favorite Ham radio stores for books on the subject and/or web-sites that support your area of interest regarding those communication modes. You may also find assistance through a local amateur radio club. You can explore the exciting world of data communications, and we believe that this is a most interesting part of the king of hobbies, Amateur Radio.

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Notice

- This unit should be used with ALINCO transceiver DR-620T/E.
- The parameter settings are retained by the built-in lithium battery. If the settings return to their default values, the battery may be depleted. Should this occur, consult your Alinco dealer.

Please refer to the Alinco transceivers' instruction manual for the proper installation of this unit.

Index

1. Description	5
2. Commands	6
2-1 command mode and converse mode	6
2-2 general use of commands	6
2-2-1 Direct commands	6
2-2-2 Setting parameters	6
2-2-3 Reconfirming the stored parameters	6
2-3 Error messages	6
2-3-1 [?EH]	6
2-3-2 [?BAD],[?RANGE],[?TOO LONG]	6
2-3-3 [?TOO MANY],[NOT ENOUGH]	6
2-4 Command chart	7
3 Connection to a host (PC)	10
3-1 communication environment	10
3-2 Relative commands	11
3-2-1 ABAUD commands	11
3-2-2 AWLEN commands	11
3-2-3 PARITY commands	11

3-2-4	ECHO commands	11
3-2-5	FLOW commands	11
3-2-6	XFLOW commands	11
3-2-7	AUTOLF commands	12
3-2-8	FLOVER commands	12
4	Communication related commands (as a wireless modem)	12
4-1	Basic commands for the communication	12
4-1-1	HBAUD command	12
4-1-2	MYCALL command	12
4-1-3	CALIBRAT command	13
4-2	Transmission related commands	13
4-2-1	PPERSIST command	14
4-2-2	PERSIST command	14
4-2-3	SLOTTIME command	14
4-2-4	DWAIT command	14
4-2-5	SOFTDCD command	14
4-2-6	TXDELAY command	15
4-2-7	AXDELAY command	15
4-2-8	AXHANG command	15
4-2-9	FULLDUP command	15
4-3	Reception related commands	15
4-3-1	PASSALL command	15
4-4	Commands for 2way communications (being connecte)	16
4-4-1	CONNECT command	16
4-4-2	DISCONNE command	16
4-4-3	CONOK command	16
4-4-4	CMSG command	16
4-4-5	CMSGDISC command	16
4-4-6	RESPTIME command	16
4-4-7	FRACK command	17
4-4-8	RETRY command	17
4-4-9	TRIES command	17
4-4-10	CHECK command	17
4-4-11	FIRMRNR command	17
4-4-12	CONSTAMP command	18
4-5	Commands without being connected	18
4-5-1	UNPROTO command	18
4-5-2	BEACON command	18
4-5-3	BTEXT command	18
4-6	Commands to set parameters for packets	18
4-6-1	SENDPAC command	19
4-6-2	CR command	19
4-6-3	LFADD command	19
4-6-4	PACLEN command	19
4-6-5	PACTIME command	19
4-6-6	CPACTIME command	19
4-6-7	MAXFRAME command	20
4-7	Monitor related command	20

4-7-1	MONITOR command	20
4-7-2	MCOM command	20
4-7-3	MCON command	21
4-7-4	MALL command	21
4-7-5	MRPT command	21
4-7-6	TRACE command	21
4-7-7	MSTAMP command	21
5	To connect to GPS	21
5-1	What does it do with GPS?	21
5-2	Compatible GPS	22
5-3	Communication environment	22
5-3-1	Initial parameter setup	22
5-4	Contents of GPS data	22
5-4-1	SONY	22
5-4-2	SMATC	23
5-4-3	\$GPGGA	23
5-4-4	\$GPVTG	24
5-4-5	\$GPZDA	24
5-4-6	\$GPRMC	24
5-4-7	\$GPGLL	25
5-4-8	\$PNTS	25
5-4-9	Notes for NMEA-0183	25
5-5	Details of GPS data processing	26
5-6	GPS related commands	26
5-6-1	GBAUD command	26
5-6-2	LPATH command	27
5-6-3	LOCATION command	27
5-6-4	LTEXT command	27
5-6-5	LTMON command	27
5-6-6	LTMHEAD command	27
5-6-7	GPSTEXT command	27
5-6-8	NTSGRP command	28
5-6-9	NTSMRK command	28
5-6-10	NTSMMSG command	28
5-6-11	GPSEND command	28
6	Function modes	28
6-1	Command mode	28
6-2	Converse mode	29
6-2-1	CONVERSE command	29
6-2-2	K command	29
6-2-3	8BITCONV command	29
6-2-4	AFILTER command	29
6-3	Transparent Mode	29
6-3-1	TRANS command	29
6-3-2	TRFLOW command	30
6-3-3	TXFLOW command	30
6-4	Automatic mode change	30
6-4-1	NOMODE command	30

6-4-2	CONMODE command	30
6-4-3	NEWMODE command	30
6-5	KISS mode	30
6-5-1	KISS command	30
7	LED	30
7-1	DCDLED terminal (CPU #6 pin)	30
7-2	CONLED terminal (CPU#7 pin)	30
7-3	STALEd terminal (CPU #8 pin)	30
7-4	PTTLED terminal (CPU #9 pin)	30
7-5	LED related command	30
7-5-1	HEALLED command	30
8	Digipeat functions	30
8-1	Digipeat related commands	30
8-1-1	DIGIPEAT command	30
8-1-2	MYALIAS command	30
8-1-3	HID command	30
8-1-4	ID command	30
8-2	General information on UI digipeat	32
8-2-1	To eliminate unnecessary relays	32
8-2-2	How to use commands (example of actual ation)	32
8-3	UI digipeat related commands	32
8-3-1	UICHECK command	32
8-3-2	UIDWAIT command	32
8-3-3	UIDIGI command	33
8-3-4	UIFLOOD command	33
8-3-5	UITRACE command	34
8-3-6	UISSID command	35
8-3-7	NPATH command	36
8-3-8	SPATH command	37
8-3-9	EPATH command	37
8-3-10	WPATH command	37
9	Multi-connect function	37
9-1	Multi-connect related commands	37
9-1-1	USERS command	37
9-1-2	STREAMSW command	37
9-1-3	STREAMDB command	37
9-1-4	LCSTREAM command	38
9-1-5	STREAMCA command	38
10	Message board function	38
10-1	Setting commands for Message board	38
10-1-1	MBOD command	38
10-1-2	MYCALL command	38
10-1-3	TOUT command	38
10-1-4	ROUTE command	39
10-1-5	OVERKILL command	39
10-1-6	EXTCLR command	39
10-1-7	LOG command	39
10-2	Message operation command (for sysmanager)	39

10-2-1	FILE command -----	39
10-2-2	LIST command -----	39
10-2-3	MINE command -----	39
10-2-4	READ command -----	40
10-2-5	WRITE command -----	40
10-2-6	KILL command -----	40
10-3	Message Board related LED -----	40
10-3-1	MBODLED terminal (CP9 pin) -----	40
10-3-2	MAILED terminal (CP0 pin) -----	40
10-3-3	MAIL command -----	40
10-4	Message operation command (for -----	40
10-4-1	W command -----	40
10-4-2	B command -----	41
10-4-3	F command -----	41
10-4-4	M command -----	41
10-4-5	L command -----	41
10-4-6	R command -----	41
10-4-7	A command -----	41
10-4-8	J command -----	41
10-4-9	K command -----	41
10-4-10	H command -----	41
11	Miscellaneous commands -----	42
11-1	Reset / Initialization -----	42
11-1-1	RESTART command -----	42
11-1-2	RESET command -----	42
11-2	Display the parameter status -----	42
11-2-1	DISPLAY command -----	42
11-3	date/time setting and display set-----	42
11-3-1	DAYTIME command -----	42
11-3-2	DAYUSA command -----	42
11-3-3	DAYSTAMP command -----	43
11-4	RAM check command -----	43
11-4-1	RAMTEST command -----	43

1. Description

The communication protocol of this unit is compatible with AX.25 version 2 Level 2. This enables a reliable connection with CRC check and the re-try function. It is also capable of transmitting without being connected to a node (unproto mode or beacon mode). This protocol is identical to the one conventionally used in a TNC for Amateur Radio. The 9600 bps non-synthesized serial mode is used to connect to a host (computer or terminal). The unit is also enhanced with a GPS connection capability. The EJ-50U processes and converts data from a GPS receiver and re-transmits it as a beacon at predetermined intervals. This advanced feature allows the easy setup of mobile units for GPS position-reporting systems such as APRS.

2. Commands

In this manual, unless otherwise specified, any “key” refers to the keys on a PC keyboard. The “screen” referred to is the PC monitor screen.

2-1 Command mode and Converse mode

The typical operating modes of this unit are the Command mode and the Converse mode.

It is necessary to use the command mode to set internal parameters, or execute immediate direct commands in the EJ-50U. When the unit is in the command mode, the “cmd:” prompt will appear on the screen. If “cmd:” does not show up, press enter (or carriage return [CR], or <CTRL+C>).

The Converse mode enables the EJ-50U to transmit text as data. Use this mode for sending files and/or text. Press the <Ctrl +C> keys together to return to the command mode.

2-2 General use of the commands

2-2-1: Direct commands

The commands without specific definitions or parameter settings are Direct Commands. These are mainly used to change modes. These commands are immediate, such as D for Disconnect.

2-2-2: Setting parameters

Type the command parameter name. Enter a space after the parameter name and type the new value. Press [CR] to enter. The screen will show “XXX was YYY”(XXX stands for the parameter, YYY for the previous value). If the parameter setting is ON/OFF, use the Y key for ON, N key to select OFF.

2-2-3: Reconfirming the stored parameters

Type the command name only and press [CR] key. The monitor will show “XXX is ZZZ” (ZZZ stands for current value).

2-3: Error messages

2-3-1 [?EH]

This prompt will be displayed when the command does not exist or an invalid string is entered.

2-3-2 [?BAD][?RANGE][?TOO LONG]

If the entered command does not specify the parameter [?BAD] appears. If the command exceeds the parameter range [?RANGE] appears. If the length of a column is too long, [?TOO LONG] appears.

2-3-3 [?TOO MANY][?NOT ENOUGH]

If the parameter value is too long [?TOO MANY] will be displayed.

If the parameter value is too short [?NOT ENOUGH] will be displayed.

2-4 Command chart

The following is a chart for the commands commonly used in Amateur Radio communications.

Command	abbreviation	default	range	Description	Ref.
8BITCONV	8	ON	ON/OFF	bits, number of characters in the converse mode	6-2-3
ABAUD	AB	9600	600-15200	sets serial port communication speed	3-2-1
AFILTER	AF	0	0-\$80	skips display of defined characters	6-2-4
AUTOLF	AU	ON	ON/OFF	Adds a line-feed [LF] after [CR]	3-2-7
AWLEN	AW	8	7/8	Specifies the data bits, 7 or 8, between the host and TNC	3-2-2
AXDELAY	AND	0	0-120	delay time in units of 10ms before data is sent. AXD is in addition to value set in TXD. Useful when doing packet through a voice repeater	4-2-7
AXHANG	AXH	0	0-250	“hang” time in units of 10ms Used with repeaters that have hang times in excess of 10 ms	4-2-8
BEACON	B	EVERY 0	EVERY/AF TER n(0-250)	The transmission interval of the beacon signal in increments of 10 seconds	4-5-2
BTEXT	BT	N/A	159 characters	The message text sent out as a beacon at the intervals specified in BEACON	4-5-3
CALBRAT	CAL	N/A	N/A	Calibrate mode. In this mode, the TNC sends the mark and space at 50% duty. Press Q to exit this mode.	4-1-3
CHECK	CH	30	0-250	Checks if TNC is still in the connected state. 10 sec units	4-4-10
CMSG	CMS	OFF	ON/OFF	When another station connects to you, a message can be transmitted automatically.	4-4-4
CMSGDISC	CMSGD	OFF	ON/OFF	When another station connects, a message is sent and the other station is then disconnected automatically.	4-4-5
CONMODE	CONM	Convers	Cconvers / Trans	Automatically selects either Converse or Transparent mode when connection occurs. NOMODE should be OFF	6-4-2
CONNECT	C	N/A	Call (VIA Call1,call2 ...,call8)	Request a connection (after “VIA” if using digi-peaters) eg: C KW1KW or C KW1KW VIA K6ANC	4-4-1
CONOK	CONO	ON	ONN/OFF	Allows acceptance of a connection request from another station (or not).	4-4-3
CONSTAMP	CONS	OFF	ON/OFF	When ON, the date of the connection is displayed.	4-4-12
CONVERSE	CONV K	N/A	N/A	Puts TNC in the converse mode. You may simply press K to abbreviate this command.	6-2-1 6-2-2
CPACTIME	CP	OFF	ON/OFF	Validates PACTIME feature in converse mode.	4-6-6
CR	CR	ON	ON/OFF	Adds a Carriage Return [CR] to outgoing packets.	4-6-2
DAYSTAMP	DAYS	OFF	ON/OFF	When on, indicates the date and time when packet is transmitted.	11-3-3
DAYTIME	DA	N/A	YYMMDDh hmmss	sets the date/time of the internal clock. Info not retained through off/on power cycles	11-3-1
DAYUSA	DAYU	ON	ON/OFF	Determines date display format, USA or Continental.	11-3-2
DIGIPEAT	DIG	ON	ON/OFF	When ON, TNC can be used as a digipeater by others.	8-1-1
DISCONNE	D	N/A	N/A	Sends the disconnection command.	4-4-2
DISPLAY	DISP	N/A	(A/C/H/I/L/ M/T)	Displays all the current settings of the TNC.	11-2-1
DWAIT	DW	30	0-250	The interval period (in 10 mS units) the TNC waits to send a packet after the frequency is clear of traffic.	4-2-4

ECHO	E	ON	ON/OFF	Activates echo back of your keystrokes on the computer screen	3-2-4
EPATH	EPATH	N/A	Call1, --, Call7	Sets digipeater list to be replaced while using UISSID	8-3-9
EXTCLR	EXTC	N/A	N/A	Clears the Message Board	10-1-6
FILE	FI	N/A	N/A	Displays all messages on the Message Board.	10-2-1
FIRMRNR	FIR	OFF	ON/OFF	In RNR frame reception, TNC waits to transmit until next frame reception.	4-4-11
FLOVER	FL	0	0-120	Sets time when the TX/RX buffers are cleared after the host's buffer has filled up. A unit of 1mS.	3-2-8
FLOW	F	ON	ON/OFF	When on, when you start keyboard activity, TNC output to the terminal stops.	3-2-5
FRACK	FR	3	0-15	The re-try waiting period in units of 1 second.	4-4-7
FULLDUP	FU	OFF	ON/OFF	To select Full-Duplex or Semi-Duplex mode. Not useful in a monoband transceiver	4-2-9
GBAUD	GB	4800	4800/9600	Sets the data communication rate with the GPS receiver	5-6-1
GPSEND	GPSS	N/A	159 characters	Use to output up to 159 characteristics to initialize the GPS. This data cannot be memorized.	5-6-10
GPSTEXT	GPST	\$PNTS	6 characters	Sets the data string to be sent into LTEXT from the GPS.	5-6-6
HBAUD	HB	1200	1200/9600	Changes the data rate of communications over the radio (1200 or 9600bps)	4-1-1
HEALLED	HEAL	OFF	ON/OFF	Tests LEDs on TNC	7-5-1
HID	HI	ON	ON/OFF	When ON, sends ID after packets are digipeated through your station	8-1-3
ID	I	N/A	N/A	Transmits ID immediately.	8-1-4
KILL	KI	ON	ON/OFF	Deletes Messages on the message board	10-2-6
KISS	KISS	OFF	ON/OFF	TNC will enter the KISS mode after the next boot-up.	6-5-1
LCSTREAM	LCS	ON	ON/OFF	Allows lower case letter to be used after stream switch command is sent	9-1-4
LIST	LI	N/A	N/A	Displays all messages except private messages being sent from one station to another	10-2-2
LOCATION	LOC	EVERY 0	EVERY/AF TER n(0-250)	Sets the time interval of GPS data transmissions (stored in LTEXT) in 10 second increments.	5-6-3
LOG	LOG	N/A	N/A	Displays a list of stations that connected to the Message Board.	10-1-7
LPATH	LPA	GPS	Call (VIA call1,call2 --,call8)	Sets the outgoing path of GPS data. (Including DIGipeater(s) used).	5-6-2
LTEXT	LT	N/A	159 characters	The GPS data buffer.	5-6-4
LTMON	LTM	0	0-250	Displays the LTEXT message as if it were received as a beacon signal, in preset intervals.	5-6-5
MAIL	MAI	OFF	ON/OFF	When ON, LED indicates when messages are received	10-3-3
MALL	MA	ON	ON/OFF	Monitor all stations/not connected stations	4-7-4
MAXFRAME	MAX	4	1-7	The maximum number of packet frames the unit can transmit at once	4-6-7
MBOD	MB	OFF	ON/OFF	Enables use of Message Board	10-1-1
MCOM	MCOM	OFF	ON/OFF	TNC monitors all I frames.	4-7-2
MCON	MC	OFF	ON/OFF	Monitor (or not monitor) other stations while you are connected.	4-7-3
MINE	MI	N/A	N/A	Displays the list of messages addressed to my callsign from the Message Board.	10-2-3

MONITOR	M	ON	ON/OFF	Monitor (or not monitor) packet communications.	4-7-1
MRPT	MR	ON	ON/OFF	When ON, displays digipeat route in the header.	4-7-5
MSTAMP	MS	OFF	ON/OFF	Applies date/time to the header	4-7-7
MYCALL	MY	NOCALL	6 characters +SSID	Sets your callsign in the TNC	4-1-2
MYALIAS	MYA	N/A	6 characters +SSID	Sets the "name" of your Digipeater.	8-1-2
MYMCALL	MYM	N/A	6 characters +SSID	Sets callsign for your Message Board	10-1-2
NEWMODE	NE	OFF	ON/OFF	If ON, TNC reverts to command mode when a connection is terminated	6-4-3
NOMODE	NO	OFF	ON/OFF	When OFF, changes the mode to the parameter specified in CONMODE when a connection	6-4-1
NPATH	NPATH	N/A	Call1, --, Call7	Sets the list of digipeater stations When using UISSID relay.	8-3-7
NTSGRP	NTSGR P	N/A	3 characters	Adds group-codes into the GPS data.	5-6-7
NTSMRK	NTSMR K	0	0-14	Adds MARK# in the GPS data.	5-6-8
NTSMMSG	NTSMS G	N/A	20 characters	Add NTS message into the GPS data.	5-6-9
OVERKILL	OVE	0	0-255	The number of old messages to be deleted when a message exceeds the memory capacity of the Message Board.	10-1-5
PACLEN	P	128	0-255	Sets the maximum length of the data part of the packet	4-6-4
PACTIME	PACT	AFTER 10	EVERY/AF TER n(0-250)	The interval time until automatic packet transmission after keyboard input stops, in 100ms units.	4-6-5
PARITY	PAR	0	0-3	Sets the parity check system	3-2-3
PERSIST	PE	128	0-255	Sets the CSMA P-persistent probability	4-2-2
PPERSIST	PP	ON	ON/OFF	Selects P-Persistent CSMA	4-2-1
RAMTEST	RAMTE ST	N/A	N/A	RAM check after RAM clear. Immediate	11-4-1
READ	R	N/A	n,n,...,n	Use to read a specified (n) message from the Message Board.	10-2-4
RESET	RESET	N/A	N/A	Returns TNC to its default parameters. This command also resets the back-up memories.	11-1-2
RESPTIME	RES	5	0-250	Sets the transmission delay time of the confirmed packet.	4-4-6
RESTART	RESTA RT	N/A	N/A	Re-starts the TNC.	11-1-1
RETRY	RE	10	0-15	Sets the number of packet retries before disconnecting.	4-4-8
ROUTE	ROU	ON	ON/OFF	Shows the forwarding route On received BBS messages	10-1-4
SENDPAC	SE	\$0D	0-\$7F	Sets the characters that command a packet to be sent.	4-6-1
SLOTTIME	SL	3	0-250	Sets the interval of generating random numbers in P-persistent CSMA.	4-2-3
SPATH	SPATH	N/A	Call1, --, Call7	Sets the list of digipeater stations to be replaced in UISSID	8-3-8
STREAMCA	STREA MC	ON	ON/OFF	When ON displays callsign of connected station on its respective stream when multi- connected	9-1-5
STREAMDB	STREA MD	OFF	ON/OFF	Displays the stream-switch characters	9-1-3

STREAMSW	STR	\$01	0-\$7F	Sets character used to change STREAM	9-1-2
TOUT	TOUT	30	0-250	Message Board time-out parameter	10-1-3
TRACE	TRAC	OFF	ON/OFF	Displays the contents of all received frames.	4-7-6
TRANS	T	N/A	N/A	Enter the transparent mode.	6-3-1
TRFLOW	TRF	OFF	ON/OFF	Flow-control in the transparent mode. When ON, control comes from the host program	6-3-2
TRIES	TRI	0	0-15	Sets the number of attempts to re-send a packet that has not been acknowledged as received.	4-4-9
TXDELAY	TX	50	0-120	Designates the time delay between PTT and the start of data transmission.	4-2-6
TXFLOW	TXF	OFF	ON/OFF	When OFF TNC determines flow-control while in Transparent Mode	6-3-3
UICHECK	UIC	28	0-250	Sets the time not to relay previously received UI frames while in UI digipeat. Unit of 1s.	8-3-1
UIDIGI	UI	OFF	ON/OFF, Call1,Call2,--,Call4	Call1 to Call4 Relays A UI Packet that does not contain MYCALL and matches the set parameters. The UIDIGI call will be replaced with MYCALL	8-3-3
UIDWAIT	UIDW	OFF	ON/OFF	Can be set if PRESET or DWAIT commands become active in UI digipeat	8-3-2
UIFLOOD	UIF	Name, ID/NOID /FIRST	N/A	Determines processing of packets being digipeated. Decrements count in sequentially repeated packets	8-3-4
UISSID	UIS	OFF	ON/OFF	Determines if a special process is required when matching UI frames to the default	8-3-6
UITRACE	UIT	N/A	Name	Determines the relay of UI packets and MYCALL is not on the source list or on the relayed station list Decrements count of sequentially repeated packets.	8-3-5
UNPROTO	U	CQ	Call (VIA call1,call2,--,call8)	Sets the destination of packet and the DIGI-PEAT route while communicating unconnected.	4-5-1
USERS	US	1	0-10	Number of channels open for use in multi-connections to the TNC.	9-1-1
WPATH	WPATH	N/A	Call1,--,Call7	Sets digipeater station list to use when using UISSID relay.	8-3-10
WRITE	W	N/A	call	Write message on the Message Board to CALL	10-2-5
XFLOW	X	ON	ON/OFF	Software flow / Hardware flow controls	3-2-6

3. Connecting to the host PC

3-1 Communications environment

Set the PC parameters as follows (9600,,8,N,1 are standard settings for most terminals and software programs.)

- * Bit rate 9600Bps fixed (ABAUD)
- * data length 8 bit / 7 bit AWLEN command
- * Parity None/Even/Odd Parity command
- * Stop bit 1 bit fixed

The following parameters must meet the terminal software's requirements.

- * wireless modem to the host: echo back setting Echo command
- * wireless modem to the host: put [LF] after [CR] AUTOLF command

3-2 Relative commands

3-2-1 ABAUD command

Abbrev. AB default 9600 parameters: 600,1200,480,9600,19200

example AB 15200

Function: Sets the serial communication speed to the host. YOU MUST REBOOT by using the RESTART command or reboot when in the back-up mode. This value must match the speed of the host terminal communication port.

3-2-2 AWLEN command

Abbrev. AW default 8 parameter 7/8

example AW 8

This is used to set the data length for serial communication with the host.

7 stands for 7 bites, 8 for 8 bites. Restart is required using RESTART command, or restart when the back-up is made.

3-2-3 PARITY command

Abbrev. PAR default 0 Parameter 0 to 3

example PAR 0

This is used to set the parity between the host and serial communication.

[0],[2] No parity

[1] odd parity

[2] even parity

Restart is required using RESTART command, or restart when the back-up is made.

3-2-4 ECHO command

Abbrev. E default ON range ON/OFF

example ECHO OFF

This is used to set the echo-back of characters input from the host. ON for echo-back, OFF for none. This is compatible to terminal software's "local echo" setting. If this is not matched properly, the characters may be displayed twice or the characters may not be seen at all.

3-2-5 FLOW command

Abbrev. F default ON range ON/OFF

example F ON

When ON is selected, as you start input with the keyboard, the display of received packets will be paused. When the input is complete, send ([CR] in command mode or when transmitting the packet in converse mode). It separates the TX and RX messages for easier reading of the messages on the screen. Note that during the pause, if the serial transmitting buffer to the host is filled, the received packet will be lost.

3-2-6 XFLOW command

Abbrev. X default ON range ON/OFF

example XFLOW OFF

This is used to select software flow control ON/OFF. ON to enable flow control. Use XOFF(Ctrl+S) to pause the display, XON <Ctrl+Q> to resume. In OFF position, the hardware flow control is ON always.

3-2-7 AUTOLF command

Abbrev. AU default ON range ON/OFF

example AU ON

When on, it puts a line-feed [LF] code after the carriage return [CR]. This is to match the parameters of the terminal software such as [CR] RX, [CR]/[CR]+[LF]. The incorrect setting may result in overwriting of the new message onto the displayed message or if excessive line feeds occur.

3-2-8 FLOVER command

Abbrev. FL default 0 range 0-120

example FL10

Sets the time frame of when to clear the communication buffer to the host when the buffer between modem and host has become full. The unit value is 1 minute.

When the communication buffer from the TNC to the host has become full, the TNC will send out an RNR packet or throw away the received packets. This parameter is set to force the deletion of those packets in the buffer enabling it to accept incoming packets.

4. Communication related commands (as a wireless modem)

The following will explain communication-related commands, pertaining to the following categories:

- The basic TX/RX commands
- TX related commands
- RX related commands
- The commands used when you are connected
- The commands used when you are not connected
- Control commands in converse mode
- Monitor related commands

4-1 The basic TX/RX commands

Check these commands if the unit does not transmit.

4-1-1 HBAUD command

Abbrev. HB default 1200 parameter 1200/9600

example HBAUD 9600, HB1200

This is to determine the speed of transmitted data. If 1200 is set, it enables AFSK at 1200bps. At this position the modulated signal is output from the T1200 (29th pin) on the gate-array but there is no output from the T9600 (35th pin). When 9600 is set, GMSK 9600 bps is enabled. T9600 (35th pin) outputs the modulated signal, but there is NO output from the T1200 (29th pin).

4-1-2 MYCALL command

Abbrev., MY default NOCALL parameter : up to 6 alphanumeric characters and SSID

example MY K6ANC-15

This is to set your callsign. Usually callsigns are less than 6 characters. You may add a SSID (sub-station ID) to identify up to 16 different callsigns. To add a SSID, chose 0 to 15 preceded by a "dash" [-]. If a SSID is not added, the callsign is processed as SSID [0]. Note that the EJ-50U can transmit a signal without a callsign being entered (NO CALL). It is illegal to transmit a signal without your identification, which is a callsign. PLEASE BE SURE TO SET YOUR CALLSIGN FIRST. Also, if the same callsign is used by different stations (club-station callsign, home and mobile set-up etc) you will encounter problems. Please use a SSID to differentiate the stations and avoid problems.

4-1-3 CALIBRA command

Abbrev. CAL default: none parameter: none

Example: CAL

By using this command, the TNC enters the calibrate mode and outputs mark and space characters alternately. This is useful for checking the transmitter or for setting transmit deviation. Type [Q] key to exit.

In the 1200 bps mode, 1200 and 2200Hz signals are output alternately.

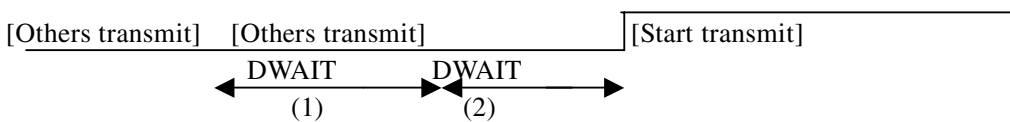
In the 9600 bps mode, the signals are not really alternated High/Low, but can be monitored by observing the eye-pattern of the modulated signals on an oscilloscope.

4-2 Transmission related commands

To avoid conflicts with other packets, these commands are used to determine how to start transmission. They are PPERSIST, PERSIST, SLOTTIME, DWAIT, SOFTDCD and TXDELAY.

Please cross-refer relative commands' description, as they are closely related each other.

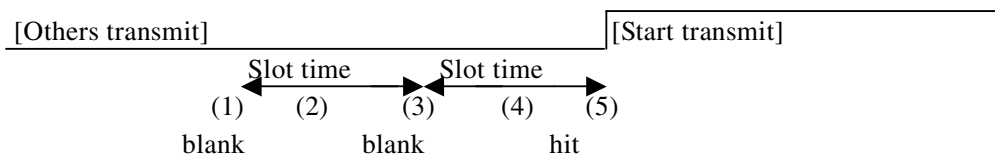
(A)PPERSIST is OFF



DWAIT: As another station stops transmission, DWAIT starts counting. While it is counting, another station starts transmitting, it stops counting. When this occurs, you cannot transmit.

(1) DWAIT: If no signal is received during the entire DWAIT period, The TNC starts to transmit.

(B)PPERSIST command is ON



It's like a slot-machine.

(1) As others stop transmitting, it generates a random number between 0 and 255. If this number is higher than the number set in the parameter, it is considered a "blank" and does not transmit.

(2) In this status, it waits until the slot time elapses, and generates a new random code again.

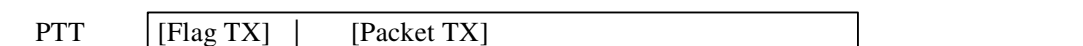
(3) If the number is higher, it's "blank" again.

(4) Again, it's waiting for another slot time.

(5) This time the number is lower than the parameter. It's a HIT and the radio transmits.

If the other stations start transmitting, it stops counting the slot time, and generates code when the incoming signal is gone.

(C) Transmission for Ham radio use



TXDELAY



- (1) As it goes to transmission, PTT turns ON and starts transmitting the Flag signal. The Flag signal is to show the partition of the packet and to synthesize the data clock.
- (2) The data transmission is held until the TXDELAY time elapses. The TXDELAY must be calculated including the physical timing of the RX/TX change of the radio, and the Flag period of the reception side of the packet. The Sleep feature is not recommended, but if it is activated at the reception side, it must be considered to determine the delay period.
- (3) When the TXDELAY period is elapsed, the packet data will start transmitting.
- (4) PTT is released when the packet is sent.

4-2-1 PPERSIST command

Abbrev. PP default: ON parameter: ON/OFF

example: PP ON

This command selects whether the P-PERSIST CSMA system is enabled or not. If it's ON, it enters the PP CSMA mode. It detects the carrier, and when the channel is empty, it starts generating the code for a slot. This is to avoid all waiting stations starting their transmissions at the same time causing a conflict. In the OFF position, the system remains Persistent CSMA. The unit transmits after the DWAIT period is elapsed.

4-2-2 PERSIST command

Abbrev. PE default: 128 parameter 0 to 255

example: PERSIST 63

This will select the parameter of the P-Persistent CSMA random code "hit" probability as previously described. If the higher number is set, the chance to "hit" increases but the potential conflict with others also may increase. If you set the value lower, the risk of conflict decreases but you cannot transmit a sequence of packets rapidly.

4-2-3 SLOTTIME command

Abbrev. SL default:3 parameter: 0 to 255

example: SL 5

This sets the time to generate a new random code for the P-Persistent CSMA system as previously described. It is set in 10 microsecond units.

4-2-4 DWAIT command

Abbrev. DW default: 30 parameter: 0 to 255

example: DWAIT 10

Sets the time delay between the end of others' transmission and your initiating a transmission. It is recommended that this be set slightly different at each station in order to avoid conflicts.

4-2-5 SOFTDCD

Abbrev. Not available default: OFF parameter ON/OFF

Example: SOFTDCD ON

This selects the method of carrier detection. If this is ON, it detects a carrier using internal software. If the incoming signal is digital data, it considers "the channel is in use". If it is OFF, it detects signals using the status of SQUELCH (SQ) terminal (the 3rd pin) on the CPU. If SQ is in the LOW position it considers "the channel is in use".

In 9600 bps mode, the EJ-50U always considers "the SOFTDCD command is in use". If this is the case, change this parameter to ON position. When set to ON, the transceiver can be run with an "open" or no squelch setting.

4-2-6 TXDELAY command

Abbrev. TX default 50 parameter: 0 to 255

Example: TX 80

This is to determine the waiting time between PTT on and the transmission of the packet, in units of 10 microseconds. During the TXDELAY period, the Flag signal is transmitted. This Flag signal is used to divide frames and to allow the radio to synthesize. Please calculate enough time for the Flag signal based on the physical TX/RX change on the transceiver, and synthesizing timing. If the “sleep” or “battery save” mode is used at the receiving end, you must calculate it also, or do not use sleep mode. When using digital modes, it is recommended that “sleep” or “battery save” modes be deactivated.

4-2-7 AXDELAY command

Abbrev. AXD default 0 range 0 to 120

example AXD 10

This command is used to determine the initial time delay until the first TX starts when operating through a voice repeater. The value is set in increments of 10m Seconds.

To send packets through a voice repeater, other than the time set for TXDELAY command, additional delay can be set with this command before the packet is sent after the PTT is activated. This parameter will be disregarded when the time set with AXHANG command has not elapsed since the last transmission was completed. If you do not use a voice-repeater, or you are using digipeaters, the parameter can remain set at the default value (0).

4-2-8 AXHANG command

Abbrev. AXH default 0 range 0-250

example AXH 10

Sets time for voice repeater “hang” (squelch-tail) timing. However this parameter MUST be set a little shorter than the actual hang time of the repeater. The unit is in 100mSeconds.

While the repeater is in hang mode, it is still operating thus it is not necessary to have a delay time. To retransmit the packet before the AXHANG parameter time has elapsed, the delay is disregarded. This parameter will become effective when retransmitting after the AXHANG parameter time has elapsed.

4-2-9 FULLDUP command

Abbrev. FU default OFF range ON/OFF

example FU OFF

Selects full-duplex mode or simplex mode.

ON: Full-Duplex

OFF: Semi-Duplex

In Full-Duplex mode, a transmission will take place regardless if the frequency is clear or not. This mode is used for communications using separate TX/RX frequencies, such as a satellite or full-duplex repeater communications.

Choose simplex mode for normal two-way communications on a single frequency. In this mode, transmission takes place only when the frequency is not in use.

4-3 Reception related commands

4-3-1 PASSALL command

Abbrev. PASSA default: OFF parameter: ON/OFF

example: PASSALL ON

In AX. 25 protocol, it detects the error on frames using CRC code. PASSALL command determines how to process such errors, if found. If it's ON, the error frame is accepted. If OFF is selected only correct frames are

accepted. Please leave this parameter OFF for error-free communication.

4-4 Connected for 2way communications (being connected)

In the connected communication mode, in accordance with the AX.25 protocol, data is exchanged with “Yes, I got it” or “I didn’t get it, please retransmit” kind of information. If the confirmation (“I got it”) is not received after transmission, the TNC retransmits the data.

In this chapter the following commands will be explained.

- Connect, Disconnect commands: CONNECT, DISCONE
- When a request for connection is received: CONOK, CMSG, CTEXT, CMSGDISC
- Retransmission related: RESPTIME, FRACK, RETRY, TRIES, CHECK, FIRMRNR

4-4-1 CONNECT command

Abbrev. C default: not available parameter: destinations callsign VIA repeaters 1 to 8

example: C K6ANC-1

C K6ANC-1 VIA K6ANC-2

C K6ANC-1 V K6ANC-2, K6ANC-3

This will send a connect request frame (SABM). If the confirmation (UA frame) is received, “*** CONNECTED TO” followed by connecting callsign and its repeater ID (if any) will appear on the screen and a connection is established. Once connected, AX.25 protocol enables error-free communications. If a UA frame is not received, it transmits a SABM frame up to a predetermined number of times. If a UA frame is still not received, the TNC automatically disconnects.

Enter the destination callsign as shown in the example. The first example shows that you wish to connect to K6ANC-1. As shown, you should add the SSID, as needed. You may also include a relay stations’ callsign in case you cannot connect directly to the other station. In this case, you can add VIA or V followed by the relay stations’ callsigns. Up to 8 stations can be specified for the relay(s).

The last example shows that you are going to connect K6ANC-1 using K6ANC-2 and K6ANC-3 as relay stations.

Remember that the EJ-50U does not have a relay function so if you may need to be a relay station yourself, please use an external TNC for that operation.

4-4-2 DISCONNE command

Abbrev. D default: none parameter: none

example: D

This command sends a disconnect-request frame (DISC). When the reconfirmation frame(UA frame) is received, the screen displays “***** DISCONNECTED” and goes to the disconnected mode.

4-4-3 to 4-4-6 intentionally deleted (for commercial use only)

4-4-6 RESPTIME command

Abbrev: RES default: 5 parameter: 0-250

example: RES 5

In the connected packet mode, your TNC must reply to the destination by saying “Yes, I got your packet”(RR frame) after the information (I frame) was correctly received. Up to 7 RR frames can be sent together at one time. For example, you can reduce the RR frame transmission during a file transaction when different I frames are received frequently. This command sets the waiting time between the reception of an I frame and transmission of a RR frame in units of 100 ms. The communication efficiency may become poor if a higher number is set as the time delay to send RR becomes longer. If an even higher number is set, an I frame may be sent before an RR frame

is sent.

4-4-7 FRACK command

Abbrev. FR default: 3 parameter: 0-250

example: FR 5

When you are “on-line” (connected) and the transmitted information frame (I frame) is received at its destination correctly, you receive a “Yes, I got it” (RR frame). If a certain time has elapsed but you still don’t get a reply, the I frame will be transmitted again (retry feature). Beside I frames, and a connection request frame (SABM frame), there are frames that require a reconfirmation from the destination. The retry will take place if a reply is not received. This command sets the time duration between the end of transmission of the reply-required signal and the start time of a retry transmission in 1 second.

When a relay station is involved, it automatically waits for a [(number of relay stations X 2 + 1) X parameter] period. The relay stations only pass the messages, and they do not acknowledge each packet. Accordingly, the transmitted packet takes some time until it gets to the destination and a reply comes back.

This unit automatically changes the retry fraction time in accordance with the number of relay stations. In a case where packet traffic is very high, set this parameter a little higher than the default. It eliminates unnecessary retries when traffic is reduced.

4-4-8 RETRY command

Abbrev. RE default 10 parameter: 0-15

example: RE 15

This command is used to set the maximum number of retries. When the maximum number of retries exceeds the parameter, [***** retry count exceeded],[***** DISCONNECTED] appears on the screen, and the TNC returns to the disconnected state. The conventional TNC AX.25 protocol may transmit a SABM frame at this point, and the RELINK command (default OFF) is available to set this option. The EJ-50U does not have this parameter (fixed at OFF position).

4-4-9 TRIES command

Abbrev. TRI default: 0 parameter: 0-15

example: TRI 0

This is to display and adjust the current retry counter. If the command TRIES is entered, it might report back TRIES 9. You can enter TRIES 2 and in doing so, you reset the number of TRIES before reaching the cutoff figure set under RETRY.

4-4-10 CHECK command

Abbrev. CH default 30 parameter: 0-250

example CH12

When connected, even without sending data, this command sends a message to the effect of “Are you still there?” to check if the link is still present. This parameter sets the time between the sending of the check-packet (“Are you still there?”) after the destination’s signal is received, in 10 ms unit.

4-4-11 FIRMRNR command

Abbrev.: FIR default: OFF parameter: ON/OFF

example: FIR ON

When the “Wait a moment!” message (RNR frame= not available for reception) is received from the destination, this parameter determines how your station will proceed with sending your packet.

When the setting is in the ON position and you receive RNR frame, it does not transmit the packet until you receive another frame from the destination. In the OFF position, it will transmit the packet regardless of the RNR

status. This may result in poor communications efficiency by sending packets that will not be received.

4-4-12 CONSTAMP command

Abbrev.:CONS default: OFF parameter: ON/OFF

example: CONS ON

When ON, adds date and time to the displayed packet when connected or not.

ON: When the date and time is previously set using DAYTIME command, the date and time of connection will appear on the display.

OFF: It does not appear on the display when connected.

4-5 Commands without being connected

These commands are used when sending packets without being connected to another station. Some examples of unconnected messages might be a "CQ" message, an informational beacon, a chat session with many stations or APRS location beacons.

In this mode, the receiving station(s) will discard incomplete data without requesting a retry and the transmitting station does not re-transmit. Accordingly there is no guarantee of error-free transmission in this mode. In this chapter we explain:

- UNPROTO to set to send data directly or through relay stations without being connected
- BEACON, BTEXT for the beacon related commands

To broadcast GPS data there are LPATH, LOCATION, and LTEXT commands. These will be explained in the GPS chapter, but they are similar to UNPROTO, BEACON and BTEXT so that they may be used as secondary beacons.

4-5-1 UNPROTO commands

Abbrev. U default: CQ parameter: destination's callsign (with up to 8 with using VIA)

example: U CQ

U APRS V RELAY,WIDE

This is used to designate relay station for your unconnected transmission

4-5-2 BEACON command

Abbrev.: B default: EVERY 0 parameter: EVERY/AFTER 0-250

Example: B E 6

This is to set the timing of the transmission of beacons. The prefix E allows that the beacon will be sent at every interval specified by the following number. The prefix A allows that a beacon will be sent only once when nothing is received during the time period specified by the following number. No beacon will be sent when the number "0" is set. Each unit is a multiple of 10 seconds.

4-5-3 BTEXT command (Beacon Text)

Abbrev. BT default: none parameter: up to 159 characters.

If this parameter is left blank, no message will be sent. Use % character to intentionally leave it blank. This text will be beacons at intervals designated under the BEACON command

4-6 Commands to set parameters for packets

In the converse mode, characters entered from the terminal will be sent as a packet, or sequence of packets, to the receiving station. These commands are used by the TNC to make those packets. When one of the following conditions is satisfied, the input characters will be considered as an information frame (I frame) and sent.

- The specific characters are input : SENDPAC
- Relative command: CR

- When they reach pre-determined length: PACLEN
- When the pre-set time is elapsed: PACTIME and relative CPACTIME

You may transmit different frames as one packet. The maximum number of these frames can be determined with MAXFRAME command.

4-6-1 SENDPAC command

Abbrev.: SE default: \$0D parameter: 0-\$7F

example: SENDPAC \$0D

In the converse mode, when the letter code specified with this parameter is entered, the letters preceding the code are considered a complete packet (information frame=I frame) and will be sent out. Default is CR. The codes set in this parameter won't be included in the frame.

4-6-2 CR command

Abbrev. CR default: ON parameter: ON/OFF

example: CR ON

This command determines if the [CR] code is added (or not) at the end of the I-frame transmission. [CR] is added if ON is chosen. [CR] won't be added if OFF is chosen. Normally, the SENDPAC command does not include [CR] when it makes an I frame, as it is already "\$0D"=[CR]. In this case, when this parameter is ON, [CR] is added after the I frame. As a result, the [CR] code will be left.

4-6-3 LFADD command

Abbrev. LF default OFF range ON/OFF

example LF ON

Selects adding LF code after CR code on I frame of sending packet.

ON: LF code is added.

OFF: LF code is not added.

4-6-4 PACLEN command

Abbrev. P default: 128 parameter: 0-255

Example: P 78

When the number of input characters (bites to be exact) reach this parameter, the data will be considered as a complete packet (I frame) and sent.

4-6-5 PACTIME command

Abbrev. PACT default: AFTER 10 parameter: EVERY/AFTER 0-250

Example: PACT A 10

This command was originally for the transparent mode, which is not supported by this unit. When the CPACTIME command, (which will be explained later) is set ON, this command becomes effective in the converse mode.

The prefix EVERY (abbrev.E) is selected, the input characters will be considered as an I frame at every interval identified in the parameter setting. The parameter is set in units of 100ms. Nothing will be sent if nothing is input during the designated interval. If the prefix AFTER (abbrev. A) is selected, the packet(I frame) is sent after the time set when the time identified by the number has elapsed.

4-6-6 CPACTIME command

Abbrev. CP default: OFF parameter: ON/OFF

Example: CP OFF

This is to determine if the PACTIME command becomes effective (or not) while in the converse mode. The

PACTIME command becomes effective when ON is selected. The PACTIME command is not automatically effective on the EJ-50U.

4-6-7 MAXFRAME command

Abbrev. : MAX default: 4 parameter: 1-7

Example: MAX 7

This command sets a limit on the number of packets that have not been acknowledged by the receiving station. Since the size of the EJ-50U's transmission buffer is limited, the number of outstanding frames and the size of those frames must be considered. The maximum size and the total of the frames should be less than 330 bytes. This buffer size is the minimum required to send one maximum frame. The information field maximum length is 256 bytes, but it becomes this size when other information such as destination callsign and relative relay station data is included.

4-7 Monitor related commands

There are MONITOR, MCOM, MCON, MALL, MRPT, and TRACE commands available to control the condition and display on the screen.

4-7-1 Monitor command

Abbrev: M default: ON parameter: ON/OFF

Example: M ON

This is used to monitor packet communications (or not). If ON is selected, you will see your messages and other traffic on the monitored frequency, including unproto traffic. If OFF is selected, you will only see packets addressed to your station.

4-7-2 MCOM command

Abbrev.: MCOM default: OFF parameter: ON/OFF

Example: MCOM ON

This sets the TNC to monitor certain frames.

If set ON, and MONITOR is set ON, all frames, including control frames, are monitored. If set OFF, it monitors only I frames (information frames). When ON is selected, the frame status is shown between[< >]. The details are available from books on packet or on the internet. Frames used in packet communication are listed below:

- Types of frames

[I] information frames(I)

[RR] Available for reception frame(RR)

[RNR] Not available for reception frame(RNR)

[REJ] deny frame(REJ)

[C] connection request frame(SABM)

[D] disconnection frame (DISC)

[DM] disconnection notice frame(DM)

[UA] Non numeric system confirmation notice frame (UA)

[FRMR] frame refusal notice frame (FRMR)

[UI] Non numeric system information frame (UI)

- Pall / final-bite

[P] pall bite ON

[F] final-bite ON

- Command/Response

[C] command

[R] Response

- Sequences

[Rn] Receiving sequences. n=0-7

[Sn] Transmitting sequence n=0-7

4-7-3 MCON command

Abbrev. MC default OFF parameters: ON/OFF

Example: MC ON

This allows you to monitor frequency activity even when connected to another station.

ON allows you to monitor while you are connected. OFF does not.

4-7-4 MALL commands

Abbrev. MA default: ON parameter: ON/OFF

Example: MA ON

When ON, all stations will be monitored, connected and unconnected. When OFF, it does not monitor stations that have sent unproto data such as a CQ call.

4-7-5 MRPT command

Abbrev. MR default: ON parameter: ON/OFF

Example: MR ON

This is to determine if you wish to display relay station (digipeater) information in the header or not.

If ON is selected, the relay list will be shown with [*]. OFF excludes such information.

4-7-6 TRACE command

Abbrev. TRAC default: OFF parameter: ON/OFF

Example: TRACE ON

When ON, it will display all the details of the frame. The left side block shows frames in 16-digit codes. The right side block shows them in ASCII codes. The display system may differ from that of a conventional TNC when the EJ-50U is used.

4-7-8 MSTAMP command

Abbrev. MS default OFF range ON/OFF

example MS ON

When On, adds date/time on the monitored frame header.

ON: When the date and time has been set using the DAYTIME command, the date and time will appear.

OFF: Packet is displayed without date and time.

5. To connect to a GPS

5-1 What does it do with GPS?

GPS, the Global Positioning System, transmits signals from a constellation of GPS satellites orbiting the earth. A GPS receiver uses data from these satellites to determine the current geographical position of the receiver. This system is widely used in navigation today. The EJ-50U can transmit the position data taken from the GPS receiver at pre-determined intervals. This feature allows you to set up a mobile location system, such as a car-navigation system and/or APRS operations.

5-2 Compatible GPS

The following GPS receivers are compatible with the EJ-50U:

- (1) SONY's IPS-5000 series, IPS-3000 series, PACY-CNV10 and other GPS receivers that output the data starting with [SONY xxxxxx]. The Sony Car-Navigation system receiver that generates a data string starting with [SMATC xxxx] may work, but we do not guarantee its function, as the format of this string is not officially published.
- (2) NMEA-0183 compatible output GPS receivers.

The output data from the Sony system is 9600 bps, while most other GPS receivers commonly operate at 4800 bps but some are capable of 9600. The EJ-50U can accept either output rate but you must make the appropriate GBAUD setting.

5-3 Communication environment

- Bit-rate: 4800/9600 bps, selected with GBAUD command
- Data length: 8 bit fixed
- Parity: None fixed
- Stop-bit: 1 bit fixed

Flow control is not available. If the PC is connected as a dummy GPS, please loop PC's CTS and RTC.

5-3-1 Initial parameter setup

The bit-rate can be selected as 4800 or 9600 bps. When the RESET command is used, or the RAM's back-up data is deleted, the default settings are done by the hardware.

The CPU's GPS SEL terminal (80th pin) determines the default.

When GPS SEL terminal is in [H] position, 9600 bps becomes the default.

GPS SEL terminal is in [L] position, 4800 bps becomes the default.

The status of this pin will be checked when the RESET command is executed or RAM back up is not present. It does not effect the speed when the system is working properly, or when the RAM back-up is done with the correct bit-rate setting.

5-4 Contents of GPS data

The EJ-50U analyzes data received from the GPS receiver. Then, based on that data, it converts from one format to another. When the initial part of the input data and the GPSTEXT command matches, it re-transmits that data as a LTEXT beacon. It also allows the transmission of a non-compatible format string without the data being converted.

5-4-1 SONY

The following is a format that is output by the Sony IPS-5000 series. The EJ-50U is able to analyze it, but cannot re-structure it. It is a 110 bite fixed data string starting with [SONY] and ending with [CR][LF]. It contains date, time, latitude, longitude, altitude, speed and direction of the GPS receiver and telemetry from the satellite(s).

Example:

```
SONY80950716090346N3546569E13918458+02180040139507016090345D4BDHIFGXHbCIRDFFFPEiFHS
CKCQGBRFFeBEDDcCOCHdDH10<CR><LF>
```

Description:

SONY80 : GPS firmware's version

950701 : current date

- 6 : day
- 090346 : Current time in UTC
- N : N for North, S for South to indicate the latitude
3546569: the latitude in degree. This number can be shown in DMD (NEMA) or DMS that is selectable with a command. The identifier will appear on the later part of the data. In the DMD (NEMA) system it means 35'46.569", in DMS it means 35'46"56.9"
- E : E for East, W for west to indicate the longitude.
13918458: The longitude in degrees. In DMD 139'18.458", in DMS 139'18",45.8"
- +0218 : Altitude, It indicates the altitude in meters. Same as Geoid for NEMA format.
- 004 : GPS receiver's speed in km/h.
- 013 : The direction of the GPS receiver in degrees. 000 stands for 0 degrees north, up to 360 degrees clockwise.
- 950701, 6, 090345: The date, day and time when the receiver detected latitude, longitude, altitude, speed and direction. Time is usually indicated 1 second before the actual time.
- D : DOP value. Uses characters [A] to [Q] to indicates relative values.
- 4 : The dimension process mode. [3] stands for the 2-dimension measurements, [4] for 3-dimension measurements.
- B : Location ID. B stands for Japan, Korea
DHIFG to CCOCH: the status of satellites being received on each channel. This example shows the status of the satellites received in channels 1 to 8 to receive data. Each 5 letters defines 1 channel. The first letter shows the satellite number, 2nd shows the elevation angle, the 3rd shows direction angle, 4th shows channel status and 5th shows the signal-level of each satellite.
- D : The status of the internal oscillator of the GPS receiver.
- DH : not related to the user.
- 1 : DMS/DMD identifier. Letters for DMS, numbers for DMD.
- 0 : Parity. [0] for o, [E] for 1.
- <CR><LF> end of the data

5-4-2 SMATC

This format is used for SONY's car-navigation system "Columbus". The GPS receiver by itself is not yet available. Accordingly no further information is available, and NO DATA IS AVAILABLE FROM SONY TO THE PUBLIC. DO NOT CONTACT SONY FOR DETAILS. The string with SMATC and ends with <CR><LF>, fixed 130 bite fixed data. Similar information to "SONY" format would likely be contained.

5-4-3 \$GPGGA

This is one of NMEA-0183 compatible formats. The EJ-50U can analyze and re-structure this format. It starts with \$GPGGA followed by the numbers. They indicate:

GPGGA - Global Positioning System Fix Data

String: \$GPGGA,123519,4807.038,N,01131.324,E,1,08,0.9,545.4,M,46.9,M, , *42

123519 Fix taken at 12:35:19 UTC

4807.038,N Latitude 48 deg 07.038' N

01131.324,E Longitude 11 deg 31.324' E

1 Fix quality: 0 = invalid

1 = GPS fix

2 = DGPS fix

08 Number of satellites being tracked

0.9 Horizontal dilution of position
 545.4,M Altitude, Meters, above mean sea level
 46.9,M Height of geoid (mean sea level) above WGS84
 ellipsoid
 (empty field) time in seconds since last DGPS update
 (empty field) DGPS station ID number

5-4-4 \$GPVTG

One of the NMEA-0183 formats. Only the speed and direction can be detected. The EJ-50U can analyze and re-structure this format.

The data contains the following information:

*\$GPVTG: starts GPVTG sentence

- True course direction in degree related to the North.
- T fixed, means True Course
- Magnetic course direction in degree.
- M fixed, means Magnetic course
- Speed in knots=1.852Km/h.
- N fixed, means Knots.
- Ground speed in Km/h
- K fixed, means ground speed unit in Km
- *hh<CR><LF> check-sum and end of message

5-4-5 \$GPZDA

One of NMEA-0183 formats. It contains date and time information only. EJ-50U can analyze and re-structure this format.

The data contains the following information:

- \$GPZDA starts GPZDA sentence
- Time/minutes/seconds in UTC.
- Date 01 – 31
- Month: 01-12
- Year in 4 digit. These are also shown in UTC
- Time zone: -13 to 00 to 13
- Time zone: 00 to 59 minutes
- *hh<cr><LF> check-sum and end of message

5-4-6 \$GPRMC

One of NMEA-0183 formats. Date , time, latitude, longitude, moving speed and direction can be detected. EJ-50U can analyze and re-structure this format.

The data contains the following information:

- Starts \$GPRMC sentence.
- Hour/minutes/seconds in UTC
- The data status. [A] for valid data, [V] for invalid.
- Latitude in numbers
- N for north, S for South
- Longitude in numbers
- E for East, W for West
- Ground speed in knots.

- Direction in degrees
- Date in dd/mm/yy format.
- The difference of magnetic direction from true north.
- To which direction the magnetic direction differs. E toward east, W toward west.
- Hh<CR><LF> the check-sum and the end of the message.

5-4-7 \$GPGLL

One of NMEA-0183 formats. latitude, longitude, and time can be detected. EJ-50U can analyze and re-structure this format.

The data contains the following information:

- Starts \$GPGLL sentence.
 - Latitude in numbers
 - N for north, S for South.
 - The data status. [A] for valid data, [V] for invalid.
- Hh<CR><LF> the check-sum and the end of the message.

5-4-8 \$PNTS

This is a private-sentence based on NMEA-0183. The data contains date, time, latitude, longitude, moving speed, direction, altitude plus a short message, group codes, and icon numbers. The EJ-50U does not analyze this format but can re-structure it.

The data contains the following information:

- \$PNTS Starts the \$PNTS sentence
- version
- the registered information. [0]=normal geographical location data. This is the only data EJ-50U can re-structure. [s]=Initial position for the course setting [E]=ending position for the course setting [1]=the course data between initial and ending [P]=the check point registration [A]=check data when the automatic position transmission is set OFF [R]=check data when the course data or check point data is received.
- Dd/mm/yyyy/hh/mm/ss: Date and time indication.
- Latitude in DMD followed by N or S
- Longitude in DMD followed by E or W
- Direction: Shown with the number 360 degrees divided by 64. 00 stands for true north, 16 for east.
- Speed in Km/h
- One of 15 characters [0] to [9], [A] to [E]. NTSMRK command determines this character when EJ-50U is used.
- A short message up to 20 bites. Use NTSMMSG command to determine this message.
- A group code: 3 letters with a combination of [0] to [9], [A] to [Z]. Use NTSGRP command to determine.
- Status: [1] for usable information, [0] for non-usable information.
- *hh<CR><LF> the check-sum and end of PNTS sentence.

5-4-9 Notes for NMEA-0183

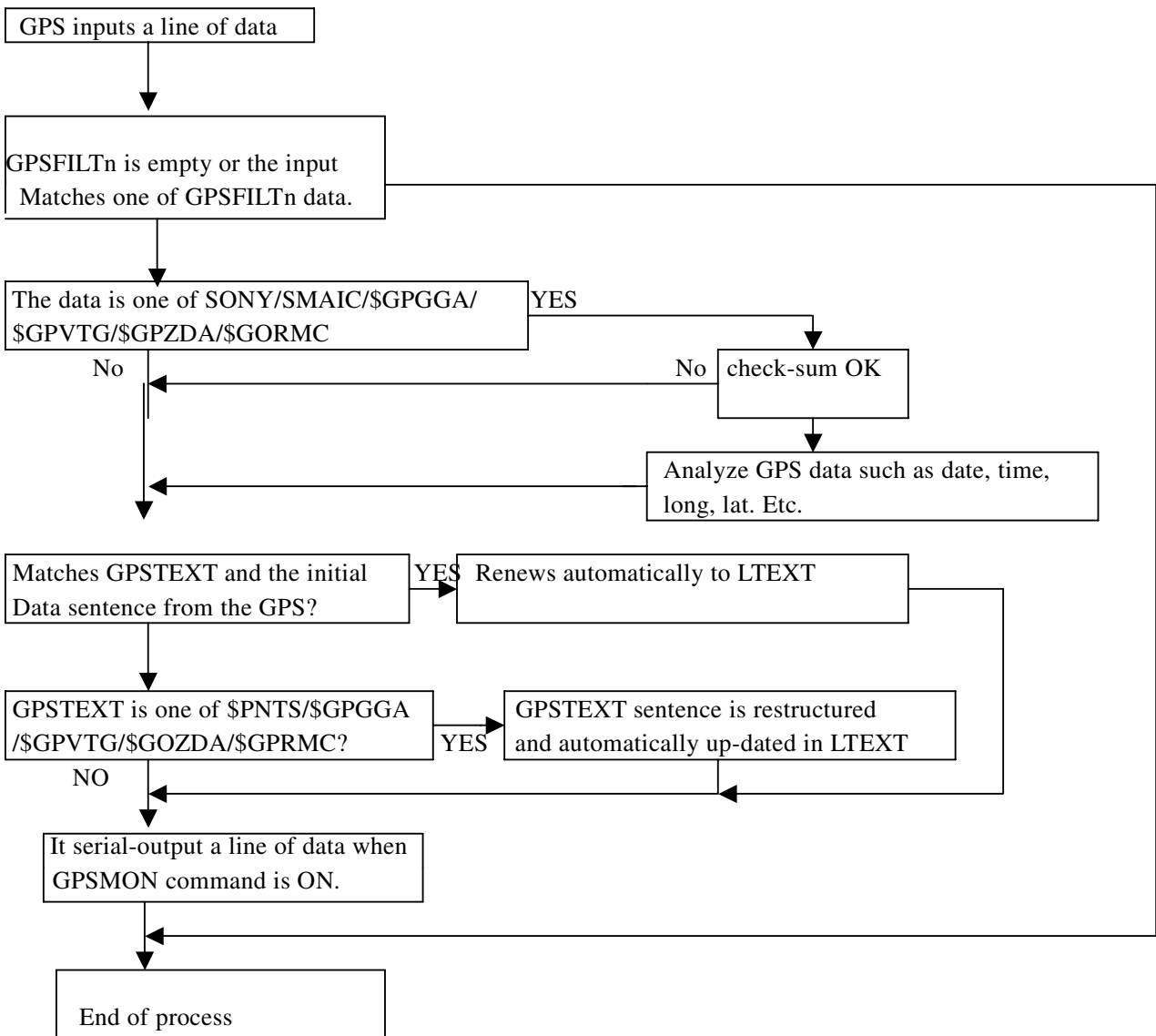
The format of NMEA-0183 data depends on each devices' own codes. The following formats are not against NMEA-0183 rules. The software used to process the received beacons must be programmed to receive and process the data, such as:

- The partition of the data field is a comma[,]. The null-field format is used when particular data is intentionally left blank. In this case, nothing is written, but used a comma to go to the next field.
- If all the data afterwards are not necessary, the data may be ended at once followed by <CR><LF>

- The numeric digits usually vary its length, sometimes without the decimal numbers.
- In order to keep a fixed length of data, 0 is added before a number like 001 to indicate 1.
- The check-sum may be eliminated. Numbers followed by * , or even * itself is sometimes eliminated.

5-5 Details of GPS data processing

In the EJ-50U, data in the LTXT buffer will be sent out as a beacon. Other than user entered data placed in the buffer by using the LTXT command, LTXT can be updated automatically with new data received from the GPS receiver. The following flowchart explains how the LTXT is automatically updated when a line of GPS data is received.



5-6 GPS related commands

5-6-1: GBAUD commands

Abbrev.: GB default: variable parameter: 4800/9600

example: GBAUD 4800

Determines the GPS port bit-rate.

4800 for 4800 bps. 9600 for 9600 bps.

Refer also to chapter 5-3-1. 4800 is recommended for NMEA compatible GPS units, 9600 for SONY GPS. Remember that this command sets bit-rate only, and is not related to the firmware of the device. The firmware checks SONY/NMEA GPS data by processing the contents of the receiving data.

5-6-2: LPATH command

Abbrev: LPATH default: GPS parameter: destination's callsign (may be combined with V for relay up to 8 stations)

example: LPA GPS VIA RELAY,WIDE

This is an UNPROTO compatible command used for GPS beacon transmissions. Use this to set the digipeater's callsign(s). See APRS software documentation for more information on the path of your beacons.

5-6-3: LOCATION command

Abbrev. LOC default: EVERY 0 parameter: EVERY/AFTER 0-250

example: LOC E 1

This command determines the interval at which the LTEXT contents will be sent out as a beacon. This is a similar command to BEACON in the conventional packet command set.

5-6-4 LTEXT command

Abbrev. LT default: none parameter: up to 160 letters.

Example: LTEXT text of LT

LT% (to empty the content)

LTEXT buffer contents will be transmitted as a beacon at the interval set with the location command. Nothing will be transmitted if the LTEXT buffer is empty. Use % to empty the buffer. By using the LTEXT command, you can manually insert text to be beacons. The LTEXT buffer can also be filled automatically by specifying a GPS output string using the GPSTEXT command and connecting a GPS unit.

5-6-5 LTMON command

Abbrev.: LTM default:0 parameter: 0-250

example: LTMON 5

The LTEXT contents can be sent to the computer and seen on the monitor as if it were received over the air. The LTMON command specifies the output interval in units of 1 second. The output won't occur when "0" is set as a parameter. Viewing the content of the LTEXT buffer is possible by using the LTEXT command but it could be difficult depending on which terminal software is being used and may cause the wireless modem to function.

5-6-6 LTMHEAD command << IMPORTANT >>

Abbrev. LTMH default: ON parameter: ON/OFF

example: LTMHEAD OFF

This command determines if a header (such as a call sign) is added with the LTMON command. With this parameter ON, it outputs all information just as other beacons are received, however, SET THIS PARAMETER OFF FOR APRS use; otherwise the position of your station may not be read.

5-6-7 GPSTEXT command

Abbrev. GPST default: \$PNTS parameter: up to 6 letters

Example: GPST \$GPRMC

When the initial part of the input data received by GPS port and the GPSTEXT command match, the GPS input

data contained in the string will be automatically placed in the LTEXT buffer. If the GPSTEXT content is one of those below and does not match with the initial part of the data, it restructures the sentence and automatically updates the LTEXT content based on previously received GPS data. In other words, the feature offers the conversion of the GPS data.

Understandable sentence	Restructurable sentence
\$GPGGA	\$GPGGA
\$GPRMC	\$GPRMC
\$GPVTG	\$GPVTG
\$GPZDA	\$GPZDA
SONY	\$PNTS
SMATC	

5-6-8 NTSGRP command

Abbrev. NTSGRP default: none parameter: alphanumeric characters up to 3

Example: NTSGRP ABC

This is to set the “group-code” in order to make \$PNTS sentence. 0-9, A-Z can be used. The PC software can select and plot only the beacon with the matching code.

5-6-9 NTSMRK command

Abbrev. NTSMRK default: 0 parameter: 0-14

Example: NTSMRK 13

This is to set the marking code for the \$PNTS sentence.

5-6-10 NTSMSG command

Abbrev. NTSMSG default: none parameter: small character up to 20 letters.

Example: NTSMSG this is a test

This is to set the message used in \$PNTS sentence.

5-6-11 GPSEND command

Abbrev. GPSS default: none parameter: up to approx. 240 characters

Example: GPSEND@SKB (SKB is used to set IPS-5000’s measurement zone as Tokyo. See your GPS manual for details).

This command transmits the entered characters to the GPS port. This command is used to send initializing command(s) to the GPS. The content cannot be stored in memory but some GPS units will have a memory feature (This is mainly to conserve space in the RAM which is very limited in this unit). The main-loop process is stopped while the data is transmitted to the GPS. Too long or too frequent transmission of the data may cause problems with the function of the TNC..

6 Operational mode

This firmware contains the following operational modes:

- command mode
- converse mode
- KISS mode

6-1 Command mode

As mentioned in 2-1, the operational mode is usually “connect mode”. The “cmd:” prompt appears when it is in the command mode. If it does not appear, use CR or return or Enter key to display it on the screen.

6-2 Converse mode

As briefly mentioned in 2-1, this is the mode to send typed data as a packet. By using the CONVERSE or the K command from the command mode, the TNC switches to the Converse mode. The TNC also enters the converse mode when you connect from your station to another station. To return to command mode from the converse mode, use Ctrl+C.

6-2-1 Converse command

Abbrev. CONV default: none parameter: none

example: CONV

This is to change the mode to CONVERSE mode. The typed data in converse mode will be sent out as a packet. To return to command mode from the converse mode, use <Ctrl+C>keys.

6-2-2 K command

Abbrev. K default: none parameter: none

Example: K

This is same as the Converse command. Since this change may be required often, the K is made available as a shortcut.

6-2-3 8BITCONV command

Abbrev. 8 default ON range ON/OFF

example 8 ON

Sets bit number used in the converse mode. Most terminals in use today use 8 bit ASCII characters.

ON: 8 bit mode is used. For Japanese characters, use this setting.

OFF: 7 bit mode is used.

6-2-4 AFILTER command

Abbrev. AF default \$00 range n1 to n4

example AF \$05, \$1A

Deletes specific characters of character codes in the received packet while connected in the converse mode. This command may avoid display of illegible characters caused by control commands. The parameters can support up to 4 characters.

\$80 deletes all control codes other than CR and LF

\$00 releases filter function.

6-3 Transparent Mode

When the converse mode is used for text communication, some of the control codes such as BS or CR are not sent. There are also embedded commands to be disregarded by the parameters set for reception mode. The transparent mode transmits and receives ALL control codes as is. When the TRANS command is sent, the mode changes from command mode to converse mode.

6-3-1 TRANS command

Abbrev. T default N/A range N/A /T

Use this command to immediately enter the transparent mode. The data typed in transparent mode will be transmitted as a packet with all control codes. To go back to command mode from the converse mode, do not enter anything for the time set in the CMDTIME parameter(default 1 second), then within the same time frame set with

CMDTIME, press the C key 3 times with the Ctrl key pressed. <CTRL+C>

6-3-2 TRFLOW command

Abbrev. TRF default OFF range ON/OFF

example TRF OFF

When ON, activates the software-flow function for the modem to host communication in the transparent mode.
 ON: Software-flow is activated. In this mode, the control codes for the soft-flow won't be forwarded correctly, so it becomes "imperfect transparent mode". The TNC responds to software flow control from the terminal.
 OFF: Soft-flow is not activated.

6-3-3 TXFLOW command

Abbrev. TXF default OFF range ON/OFF

example TXF OFF

Activates soft-flow function for the host to modem communication in the transparent mode.
 ON / OFF parameters are the same as 6-3-2.

6-4 Automatic mode change

The automatic mode select functions can be activated.

6-4-1 NOMODE command

Abbrev. NO default OFF range ON/OFF / NO OFF

Selects activation of automatic mode change function.

ON: Automatic mode change is not activated.

OFF: Activate automatic mode change. Set parameters using CONMODE and NEWMODE commands.

6-4-2 CONMODE command

Abbrev. CONM default CONVERS range CONVERS/TRANS

example CONM C

Selects either converse or transparent mode (as designated) when a connection occurs.

C or CONVERS: To enter to converse mode.

T or TRANS: To enter to transparent mode.

6-4-3 NEWMODE command

Abbrev. NE default OFF range ON/OFF

example NE OFF

Sets the timing to automatically enter to the selected mode.

ON: Enters the selected mode immediately after the connect command is sent.

OFF: Enters the selected mode only when the confirming packet is received from the destination and the connection is completed. The TNC does not automatically return to the command mode when disconnected.

6-5 KISS mode

This is a special mode to enable protocol control from the PC. Specific KISS mode software is necessary. The EJ-50U is compatible with KISS but in a very limited manner. We do not recommend the use of this mode.

KISS Mode bypasses most functions of the TNC and relies on the software in use to transfer data. Because

virtually any combination of characters can be passed by the software in use, protocols dictate that it must be very difficult to exit the KISS mode, once it has been activated. If you find the TNC in KISS mode and you wish to exit, you may use the TCP/IP command found in most KISS software or you may try sending a special sequence from your keyboard:

1. Press and hold the ALT key. Enter the numbers 192 from the numerical keypad NOT THE TOP OF THE KEYBOARD. Then release the ALT key.
2. Again press and hold the ALT KEY and enter the numbers 255 from the numerical keypad. Release the ALT key.
3. Finally, press and hold the ALT key. Enter the numbers 192 from the numerical keypad. Release the ALT key.

Provided your terminal control program sent the characters properly, the TNC should exit the KISS mode and you should see the cmd: prompt.

Chapter 7

Intentionally left blank.

8 Digipeat function

When the EJ-50U is installed into certain ALINCO transceivers, the radio and TNC can function as a digipeater. The detail of UI frames are also explained in this chapter.

8-1 Digipeat related commands

8-1-1 DIGIPEAT command

Abbrev. DIG default ON range ON/OFF

example DIG ON

Selects the desired Digipeat mode.

ON: It functions as a digipeater. If the MYCALL or MYALIAS parameter is contained in the digipeat route data received, the packet is relayed.

OFF: The digipeat mode is deactivated. Packets containing MYCALL or MYALIAS in their routing are ignored.

8-1-2 MYALIAS command

Abbrev. MYA default N/A range 6 characters alphanumeric + SSID

example MYA K6ANC-10

Used to set a callsign or alias exclusively used for digipeating. Do not set the same callsign used for MYCALL. Change the SSID. If the parameter is set to other than a callsign, activate HID command ON to transmit which station is relaying.

8-1-3 HID command

Abbrev. HID default: ON parameters: ON/OFF

example: HID ON

When ON, 9.5Minutes after having acted as a digipeater, the TNC sends an ID packet automatically. It does not do so when OFF.

If MYALIAS is set other then a callsign, set this command ON to identify your station.

8-1-4 ID command

Abbrev. ID default:N/A parameters: N/A

example: ID

feature: Use this command to manually transmit HDCL-ID. This command works only when HID command is ON. This command will become invalid when the station is not used as a repeater after ID is sent.

8-2 Concept of UI digipeat

This is to relay UI frames that match certain conditions. The APRS[□] system in North America uses a network that is constructed with UI digipeats explained herein, in order to cover a large area with a single VHF frequency. It specifies means to relay and reduce useless relays. A conventional packet to be digipeated is required to specify a relay station, or a series of stations but the UI digipeat is repeated by unspecified relay stations.

8-2-1 To reduce useless relays

The UI packet to be digipeated does not specify relay routes. This may result in multiple retransmissions of the same frame. This can be wasteful in terms of efficient frequency use. Certain methods have been developed to make digipeating more effective.

- UICHECK command: A frame, once received, cannot be relayed again for a certain period of time set with the UICHECK command. This is filtered by the sender's callsign and contents, then compared with CRC values. The UICHECK command is valid to all UI digipeat features.
- UIDWAIT command: In a conventional DIGIPEAT relay, DWAIT is considered "0", thus it transmits as soon as another transmission is terminated. This may result in conflicts with many other relayed frames. When a conflict occurs, UI frames won't be re-transmitted. Use PPERSIST and DWAIT commands to help avoid such conflicts.
- UIDIGI command condition: Sometimes called callsign substitution. Your station will not digipeat packets it originated but will digipeat calls in the specified list and then replace them with your call. When there is MYCALL in the relayed list, the content won't be relayed by your station again.
- UIFLOOD, UITRACE command feature: The relay steps can be restricted with using "callsigns of digipeater list" in UIFLOOD,UITRACE commands. This is set by "NAME X-Y", and X means the maximum number of relays. Y stands for how many relays are left. Y is decremented each time the packet is relayed. When the number is less than 1, no additional relays occur.
- UISSID command feature: The relay steps can be restricted by using "the callsign of destination" in UISSID command. This is set by "NAME X-Y", and if X is 1 to 7, it means the maximum number of the relay step. Y stands for how many relays are left.

8-3 UI digipeat feature related commands

8-3-1 UI check command

Abbrev. UIC default 28 range 0 – 250

example UIC 60

The UI frame, if heard again within the time parameter set in UICHECK, won't be relayed. The unit is seconds. The possibility of misinterpreting the identity of frames is very low, as the TNC calculates and memorizes the 16bit CRC of both the sender's callsign and the contents of the text to identify identical frames.

8-3-2 UIDWAIT command

Abbrev. UIDW default OFF range ON/OFF

example UIDW ON

When on, activates the PPERSIST or DWAIT commands, in the event of a UI digipeat relay. Conventional digipeaters transmit the relayed frames as soon as the frequency is cleared, regardless of PPERSIST/DWAIT parameters. The EJ-50U offers this command to reduce collisions of frames. When ON is set, mentioned commands become effective, while the OFF position transmits a relayed frame as soon as frequency is clear.

8-3-3 UIDIGI command

Abbrev. UI default OFF(empty) range ON/OFF call1[,call2[,call3[,call4]]]

example UI ON WIDE, TRACE, RELAY

UI OFF % (to empty "Call")

The UIDIGI relay won't work when this parameter is set OFF, or the callsign area of the parameter is empty. If you wish to clear the callsigns, enter Call1 as %, Call2 % etc. When set to ON and callsigns are entered, then the frames that match all of following conditions will be relayed. When it is relayed, the frame will be processed as below.

Relay condition: Frames that satisfies both

- The first UI frame heard within the UNCHECK command set time.
- The first callsign of the unrelayed station list matches one of call1 – call4.

Relay modification process

The first callsign of the unrelayed station list will be replaced with MYCALL set as the callsign with a relayed flag.

Example: In case of UIDIGI ON WIDE MYCALL W1AAA

W1BBB>GPS,WIDE,WIDE:Frame 1 -> W1BBB>GPS,W1AAA*,WIDE:Frame1

W1BBB>GPS,W1CCC*,WIDE:Frame2 -> W1BBB>GPS,W1CCC,W1AAA*:Frame2

8-3-4 UIFLOOD command

Abbrev. UIF default (empty), NOID / Name[,n],ID/NOID/FIRST

example UIF WIDE, FIRST

UIF WIDE, 30, NOID (this wont result an error if the second parameter is set with a number)

UIF % (to empty Name)

Select 5 alphanumeric digits for Name. UIFLOOD relay won't become effective if Name is empty. To intentionally remove a Name, enter Name as %. [n] part will be disregarded regardless of the parameter. This is to communicate with other manufacturers' UIFLOOD command. Other manufacturers' [n] in UIFLOOD command is similar to the UICHECK command in this TNC.

When ID is set, the frames that match all of the below conditions will be relayed. When it is relayed, the frame will be processed as below.

Relay condition: Frames that satisfies both

- The first UI frame heard within the UNCHECK command set time.
- The first callsign of the unrelayed station list must be [Name X – Y] parameter.

X,Y should be [1-7] and X value must be greater than Y value (Y is SSID)

Relay modification process

- Deletes relayed list
- Insert MYCALL set callsign with relayed flag.
- Reduces Y value by 1

Example: In case of UIFLOOD WIDE,ID MYCALL W1AAA

W1BBB>GPS,WIDE4-4:Frame 1 -> W1BBB>GPS,W1AAA*,WIDE4-3:Frame1

W1BBB>GPS,W1CCC*,WIDE4-3:Frame2 -> W1BBB>GPS,W1AAA*,WIDE4-2:Frame2

W1BBB>GPS,W1CCC*WIDE4-1:Frame 3 -> W1BBB>GPS,W1AAA*,WIDE4:Frame3

(Note that Y=SSID changes 1 to 0)

W1BBB>GPS,W1CCC*,WIDE4:Frame4 -> This is not Name X-Y parameter (Y is 0) thus wont be relayed in UNFLOOD command.

W1BBB>GPS,WIDE:Frame5 -> Same reason as above, no relay.

W1BBB>GPS,TRACE4-4:Frame6 -> This does not match Name, so no relay.

When NOID is set, the frame will be relayed if the same relay condition is applied as above. Relay modification

is only to reduce Y value by 1.

Example: In case of UIFLOOD WIDE, NOID MYCALL W1AAA
 W1BBB>GPS,WIDE4-4:Frame 1 -> W1BBB>GPS,WIDE4-3:Frame1
 W1BBB>GPS,W1CCC*,WIDE4-3:Frame2 -> W1BBB>GPS,W1CCC*,WIDE4-2:Frame2
 W1BBB>GPS,W1CCC*WIDE4-1:Frame 3 -> W1BBB>GPS,W1CCC*,WIDE4:Frame3
 (Note that Y=SSID changes 1 to 0)
 W1BBB>GPS,W1CCC*,WIDE4:Frame4 -> This in not Name X-Y parameter (Y is 0) thus wont be relayed in UNFLOOD command.
 W1BBB>GPS,WIDE:Frame5 -> Same reason as above, no relay.
 W1BBB>GPS,TRACE4-4:Frame6 -> This does not match Name, so no relay.

When FIRST is set, the frame will be relayed if the same relay condition is applied as above. Relay modification is to reduce Y value by 1, and MYCALL setting callsign with relayed flag will be inserted only when you become the first relay station.

Example: In the case of UIFLOOD WIDE, FIRST MYCALL W1AAA

W1BBB>GPS,WIDE4-4:Frame 1 -> W1BBB>GPS,W1AAA*,WIDE4-3:Frame1
 (MYCALL is inserted because you are the first relay)
 W1BBB>GPS,W1CCC*,WIDE4-4:Frame1 -> W1BBB>GPS,W1CCC*,WIDE4-3:Frame1
 W1BBB>GPS,W1CCC*WIDE4-3:Frame 2 -> W1BBB>GPS,W1CCC*,WIDE4-2:Frame2
 W1BBB>GPS,W1CCC*WIDE4-1:Frame 3 -> W1BBB>GPS,W1CCC*,WIDE4:Frame3
 (Note that Y=SSID changes from 1 to 0)
 W1BBB>GPS,W1CCC*,WIDE4:Frame4 -> This in not Name X-Y parameter (Y is 0) thus wont be relayed in UNFLOOD command.
 W1BBB>GPS,WIDE:Frame5 -> Same reason as above, no relay.
 W1BBB>GPS,TRACE4-4:Frame6 -> This does not match Name, so no relay.

8-3-5 UITRACE command

Abbrev. UIT default. empty range Name

example UIT TRACE or UIT % for empty

Select 5 alphanumeric digits for Name. UITRACE relay won't become effective if Name is empty. To intentionally do so, enter Name as %.

When NAME is set, the frames that match all below conditions will be relayed. When it is relayed, the frame will be processed as below.

Relay condition: Frames that satisfies both

- The first UI frame heard within the UICHECK command set time.
 - The first callsign of the unrelayed station list must be [Name X – Y] parameter.
- X,Y should be [1-7] and X value must be greater than Y value (Y is SSID)

Relay modification process

- Insert MYCALL set callsign with relayed flag.
- Reduces Y value by 1

Example: In case of UITRACE TRACE MYCALL W1AAA

W1BBB>GPS,TRACE4-4:Frame 1 -> W1BBB>GPS,W1AAA*,TRACE4-3:Frame1
 W1BBB>GPS,W1CCC*,TRACE4-3:Frame2 >

W1BBB>GPS,W1CCC*,TRACE4-3:Frame2
 W1BBB>GPS,W1CCC,W1AAA*,TRACE4-2:Frame2->
 W1BBB>GPS,W1CCC,W1DDD,W1EEE*,TRACE4-1:Frame3
 W1BBB>GPS,W1CCC,W1DDD,W1EEE,W1AAA*,TRACE4;Frame3
 W1BBB>GPS,W1CCC*,TRACE4:Frame4 -> This in not Name X-Y parameter (Y is 0) thus wont be relayed in UNTRACE command.
 W1BBB>GPS,TRACE:Frame5 -> Same reason as above, no relay.
 W1BBB>GPS,TRACE4-4:Frame6 -> This does not match Name, so no relay.

8-3-6 UISSID command

Abbrev. UIS default OFF range On/OFF

example UIS ON

When OFF is selected, UISSD command won't be relayed. ON is set, depending on the sender's SSID, relay condition and process are changed.

When SSID is 0, the relay won't take place.

When SSID is set 1 – 7, the frames that match all below conditions will be relayed. When it is relayed, the frame will be processed as below.

Relay condition: Frames that satisfy-

- The first UI frame heard within the UICHECK command set time.
- UISSID command is on
- Sender's SSID is 1-7
- No unrelayed station in the relay route

Relay modification process

- Sender's SSID is reduced by 1
- After such reduction results = 0 (you have become the last relay), inserts MYCALL setting callsign with a relayed flag.
- When you are the first relay, inserts MYCALL setting callsign with a relayed flag.

Example: UISSID ON MYCALL W1AAA

W1AAA>GPS-4:Frame1->W1BBB>GPS-3,W1AAA*:Frame1

(No relay station. MYCALL was inserted.)

W1BBB>GPS-3,W1CCC*:Frame2->W1BBB>GPS-2,W1CCC*:Frame2

W1BBB>GPS-1,W1CCC*:Frame3->w1BBB>GPS,W1CCC,W1AAA*:Frame3

(SSID is 0 so MYCALL is inserted)

W1BBB>GPS:Frame4->SSID is 0 thus UISSID command does not relay.

W1BBB>GPS-4,WIDE:Frame5-> There are unrelayed stations, so UISSID does not relay.

When SSID is set 8-11, the frames that match all below conditions will be relayed. When it is relayed, the frame will be processed as below.

Relay condition: Frames that satisfy

- The first UI frame heard within the UICHECK command set time.
- UISSID command is on
- Sender's SSID is 8-11

- No unrelayed station in the relay route

Relay modification process

- Sender's SSID is replaced with 0
- MYCALL setting callsign is inserted at the end of the relayed station list.
- Adds relay station list according to the parameter:

SSID=8: Relay station list set at NPATH command, 9:SPATH, 10:EPATH, 11:WPATH
(more than 8 stations including relayed wont be added)

Example: UISSID ON MYCALL W1AAA, NPATH S1,S2,S3

W1BBB>GPS-8:Frame1->W1BBB>GPS,W1AAA*S1,S2,S3,:Frame1

W1BBB>GPS-8,D1,D2,D3,D4,D5*:Frame2

W1BBB>GPS, D1,D2,D3,D4,D5 ,W1AAA*,S1,S2:Frame2

(More than 8 stations are not added)

W1BBB>GPS:Frame4->SSID is 0 thus UISSID command does not relay.

W1BBB>GPS-8,WIDE:Frame5-> There are unrelayed stations, so UISSID does not relay.

When SSID is set 12-15, the frames that match all below conditions will be relayed. When it is relayed, the frame will be processed as below.

Relay condition: Frames that satisfy

- The first UI frame heard within the UICHECK command set time.
- UISSID command is on
- Sender's SSID is 12-15
- No unrelayed station in the relay route

Relay modification process

- Sender's SSID remain unchanged.
- Only the first relay station digipeated will remain, rest of relayed stations will be deleted.
- MYCALL setting callsign will be inserted with relayed flag.
- Adds relay station list according to the parameter:

SSID=12: Relay station list set at NPATH command, 13:SPATH, 14:EPATH, 15:WPATH
(more than 8 stations including relayed wont be added)

Example: UISSID ON MYCALL W1AAA, NPATH S1,S2,S3

W1BBB>GPS-12:Frame1->W1BBB>GPS-12,W1AAA*S1,S2,S3,:Frame1

W1BBB>GPS-12,D1,D2,D3,D4,D5*:Frame2->

W1BBB>GPS-12,D1,W1AAA*,S1,S2,S3:Frame2 (after the 2nd relayed station list deleted)

W1BBB>GPS:Frame4->SSID is 0 thus UISSID command does not relay.

W1BBB>GPS-12,WIDE:Frame5-> There are unrelayed stations, so UISSID does not relay.

8-3-7 NPATH command

Abbrev. NPATH default empty range 7 callsigns

example NPATH W1YYY,W1ZZZ

NPATH % (empty)

In the UISSID command, sender's callsign SSID is 8 or 12, it sets the relay route to be added to the relay station list. If SSID is in excess of 8, station won't be added. Even if NPATH is empty, the relay with UISSID takes place, but without adding the relay route. Enter % to intentionally clear the value.

8-3-8 SPATH command

Abbrev. SPATH default empty range 7 callsigns

example SPATH W1YYYY,W1ZZZ

SPATH % (empty)

In the UISSID command, if the sender's callsign SSID is 9 or 13, it sets the relay route to be added to the relay station list. If SSID is in excess of 8, station won't be added. Even if SPATH is empty, the relay with UISSID takes place, but without adding the relay route. Enter % to intentionally clear the value.

8-3-9 EPATH command

Abbrev. EPATH default empty range 7 callsigns

example EPATH W1YYYY,W1ZZZ

EPATH % (empty)

In UISSID command, sender's callsign SSID is 10 or 14, it sets the relay route to be added to the relay station list. An excess of 8 stations won't be added. Even if EPATH is empty, the relay with UISSID takes place, but without adding the relay route. Enter % to intentionally clear the value.

8-3-10 WPATH command

Abbrev. WPATH default empty range 7 callsigns

example WPATH W1YYYY,W1ZZZ

WPATH % (empty)

In the UISSID command, if the sender's callsign SSID is 11 or 15, it sets the relay route to be added to the relay station list. IF the SSID is in excess of 8, station won't be added. Even if WPATH is empty, the relay with UISSID takes place, but without adding the relay route. Enter % to intentionally clear the value.

9 Multi-connection features

In this chapter, the multiple connection up to 10 stations will be explained.

9-1 Multi-Connect related commands

9-1-1 USERS Command

Abbrev. US default 1 range 0-10

example US 10

This command sets the maximum number of channels or connections a user may operate at the same time. [0 stands for 10, maximum number of channels usable.]

Each channel is called Stream, and designation of each stream is assigned as stream A to stream J. The K stream is designated exclusively for the BBS and is not related to this command.

9-1-2 STREAMSW command

Abbrev. STR default \$01 range 0 - \$7F

example STR 1

This command is used to change the stream. When the code sent with this command (default is Ctrl+[A]) is followed by A-J key, the stream will be changed to the one selected. If the wrong key is pressed, [? Link out of range] a warning will be sent to the screen. When a packet is received, the stream name and stream change code will appear, even when packets are received from streams other than one currently in use.

9-1-3 STREAMDB command

Abbrev. STREAMD default OFF range ON/OFF

example STREAMD ON

When a received packet contains stream-change code, this parameter determines whether or not to output both codes. When ON is selected the codes are both displayed. This enables you to identify which is the received code and which is the one received from other stream's packet. OFF disables this function and the code won't be displayed for both.

9-1-4 LCSTREAM command

Abbrev. LCS default ON range ON/OFF

example LCS ON

When selecting a stream, A-J, this command determines if lower case characters should be converted to upper case or not. When it is ON, the stream name A-J will be converted to upper case automatically enabling it to change the stream anyway. OFF disables it thus error message [? Link out of range] appears when the lower case is used.

9-1-5 STREAMCA command

Abbrev. STREAMC default ON range ON/OFF / STREAMC ON

This is to select whether or not the call sign of the connected station is to be displayed along with the stream name, when a packet is received in the multi-connect mode. ON enables, OFF disables.

10 Message Board feature (BBS)

This TNC unit is installed with a simplified message board feature. Messages sent from other stations will be saved in the TNC. Messages can be sent to the TNC even when a PC is not active. This chapter explains Setting commands, Operation commands (for system operator), LEDs related to message board and operations for the users. The capacity of the mailbox is 110kb.

10-1 Setting commands for Message board

10-1-1 MBOD command

Abbrev. MB default OFF range ON/OFF

example MB ON

This parameter allows the user to activate (or deactivate) the MB (message Board). ON enables, OFF disables.

Use MYMCALL command to set the MB callsign prior to use.

When OFF is selected, if a request for connection is received at MYMCALL, the BBS will refuse the connection request, sending a BUSY code.

10-1-2 MYMCALL command

Abbrev. MYM default None range 6 digit alphanumeric+SSID

example MYM W1AAA-11

Sets the callsign used exclusively for the MB. Do not use the same callsign as your regular MYCALL, but you may use an SSID, such as MYCALL-1. MB function can't be activated without an entry in this setting. MYM callsign does not function as a digipeater.

10-1-3 TOUT command

Abbrev. TOUT default 30 range 0-250

example TOUT 12

This command determines the time-out time of the message board in units of 10 seconds. When the destination's packet is not received within the TOUT setting time while connected to MB, The MB drops the

connection.

10-1-4 ROUTE command

Abbrev. ROU default ON range ON/OFF

example ROU OFF

When a Forwarded message is received from a forwarding BBS, this command determines if the routing information is saved or not. If ON, the route information is saved. OFF discards the information.

10-1-5 OVERKILL command

Abbrev. OVE default 0 range 0-255

example OVE 10

This command will delete old messages stored in the memory automatically. When a writer is entering a message larger than the remaining capacity of the memory, the “Too long, try again, canceled your message” warning appears and the message won’t be accepted. By enabling this command, the BBS automatically deletes the oldest message stored to obtain enough memory for the new message. The command sets the number of messages that can be deleted in such an event. By setting to 0, this feature is disabled.

10-1-6 EXTCLR command

Abbrev. EXTC default None range none

example EXTC

This command clears all MB memories.

10-1-7 LOG command

Abbrev. LOG default None range None

example LOG

The latest 18 stations connected to MB will be displayed as a list. In addition, the connected time will be shown if the DAYTIME command is activated. The RESTART command or turning off the power deletes the list.

10-2 Message operation command (for system manager)

A BBS is usually used by the user-stations for reading or posting messages. However, system operator commands are available for maintenance purposes, using terminal software.

10-2-1 FILE command

Abbrev. FI default None range None

example FI

This shows a list of ALL messages in the MB.

10-2-2 LIST command

Abbrev. LI default None range None

example LI

This command displays all message EXCEPT those being sent from one outside station addressed to another outside station.

10-2-3 MINE command

Abbrev. MI default None range None

example MI

This command displays all message sent to, or sent from my station.

10-2-4 READ command

Abbrev. R default None range n1,n2...

example R 2

This command allows you to read the specified message in the MB. To read multiple messages, use comma as a separation.

10-2-5 WRITE command

Abbrev. W default None range call

example W W1BBB (to specify the destination)

W (for open message)

This command is for posting a message in the MB. When this command is input, "Subject:" appears, where you can write a message title, up to 30 characters for lower case, 15 for upper case. After the title is entered, Message: appears, and you may enter the text of the message.

When your message is finished, enter [CR][Ctrl-Z][CR] or [CR]/EX[CR]. If you exceed the amount of available memory while composing a message, the WRITE function terminates and the message is deleted.

10-2-6 KILL command

Abbrev. KI default None range n1,...etc.

This command deletes messages left in the MB. Use commands as follows:

example KI n (to delete a specific message)

KI n,n,n,..(to delete multiple messages)

KI % (to delete 10 messages in order of younger message numbers)

KI & (as above in order of older numbers)

10-3 Message Board related LED

Message Board LED indicates the following status, and relative commands are explained here.

10-3-1 MBODLED terminal

It illuminates when someone is connected to MB.

10-3-2 MAILED terminal

When a message arrives in your MB, and MAIL command (explained later) is ON, LED lights up.

10-3-3 MAIL command

Abbrev. MAI default OFF / ON/OFF/MAI ON

Selects LED display (or not). If LED indication is desired in condition explained above, set this parameter ON.

10-4 Operation commands for users

The following commands are available for outside users when accessing the MB. They are not "command-mode" commands, but are used in converse mode while connected to the BBS.

10-4-1 W command

Abbrev. None default None range call

example W W1BBB (to be read only by a specific station)

W (to be read by anyone/open message)

This command is for posting message to MB. When this command is input, "Subject:" appears and the sender may enter a title message, up to 30 characters for lower case, 15 for upper case. When the title is entered, Message: appears, and the TNC is ready to receive message text.

When the message is finished, enter [CR][Ctrl-Z][CR] or [CR]/EX[CR]. If the writer exceeds the amount of available memory while composing a message, the WRITE function terminates and the message is deleted.

10-4-2 B command (BYE)

Abbrev. None default None range None

example B

The connection to MB will be terminated when a user sends B (as in “BYE”).

10-4-3 F command (FILE)

Abbrev. None default None range None

example F

To display the latest 20 messages, send F.

10-4-4 M command (MY MESSAGES)

Abbrev. None default None range None

example M

To display the latest 20 messages addressed to, or sent from, my station. Repeat M to display the next 20.

10-4-5 L command (LIST)

Abbrev. None default None range None

example L

Displays ALL messages except those sent from other stations to other stations.

10-4-6 R command (READ)

Abbrev. None default None range None

example R

To read a specific message, use as R 1.

10-4-7 A command (ABORT)

Use this command to pause reading.

10-4-8 J command (JUST HEARD)

Abbrev. None default. None range None

example J

Use this command to display the callsign who is connecting to this MB.

10-4-9 K command (KILL)

Abbrev. None default None range None

example K3

Use this command to delete the specific message like K 3.

10-4-10 H command (HELP)

Abbrev. None default None range None

example H

Use this command to display a list of HELP commands.

When the KNJ command is set to ON and ? is input, the HELP menu appears in Japanese.

11 Miscellaneous commands

The followings are miscellaneous commands:

- Restart and Reset commands
- Display commands
- Display setting according to the terminal software

11-1 Restart and Reset

11-1-1 RESTART command

Abbrev. RESTART default : none parameter: none

Example: RESTART

This will restart the TNC. If memories are stored, it initializes according to the stored data. This is used mainly to set parameters such as AWLEN and PARITY which is available only when the TNC is initialized.

11-1-2 RESET command

Abbrev. RESET default: none parameter: none

Example: RESET

This is used to set all parameters to their default values. Use this command if the TNC is operating in an erratic manner or if a return to default settings is desired. After using RESET, all user settings must be re-entered.

11-2 Display the parameter status

11-2-1 Display command

Abbrev. DISP default; none parameter: character as shown below

Example: DISP (display all)

This is used to display the parameter settings in full or in part.

DISP=	displays all parameter settings.
DISP A=	displays COM port related parameters.
DISP C=	displays special characters related parameters.
DISP H=	displays hellscouter related parameters.
DISP I=	displays ID related parameters.
DISP L=	displays link related parameters.
DISP M=	displays monitor related parameters.
DISP T=	displays timing related parameters.

11-3 Date, time and its display mode

11-3-1 DAYTIME command

Abbrev. DA default: None range YYMMDDhhmmss

example DA981016220000

Enter DA 981016220000 to display year 1998 October 16th 22:00:00. The unit of seconds can be skipped, and the value will be set as 00 seconds. The command is valid only while the unit is powered. Re-enter the current date every time the unit goes through a power off/on cycle.

11-3-2 DAYUSA command

Abbrev. DAYU default: ON range ON/OFF

example DAYU ON

This is to select how the date will be displayed. When ON is selected, the date will be shown as USA style, such as 10/16/98 for October 16, 1998. When OFF is selected, the display will become 16/10/98 for the same date.

11-3-3 DAYSTAMP

Abbrev. DAYS default: OFF range ON/OFF

example DAYS ON

In converse mode, typing T with Ctrl pressed <CTRL+T> sends time data. By turning this command ON, the date information is transmitted. OFF disables the function.

11-4 RAM check command

11-4-1 RAMTEST command

Abbrev. RAMTEST default: None range None

example RAMTEST

The RAMSET command clears the RAM, then checks and displays available memory capacity and error address. To exit, turn off the power.

Information, functions and features subject to change without notice or obligation.

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