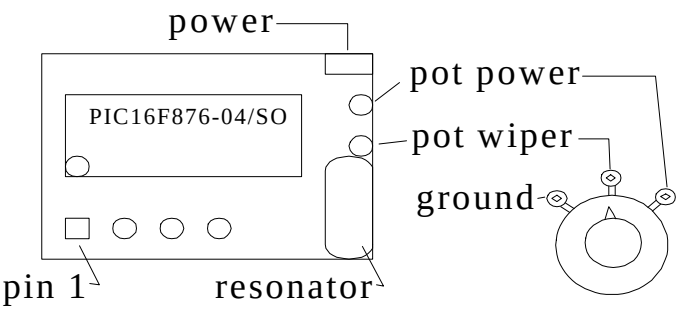
Installing and Using: The MegaPK from Jackson Harbor Press PIC based keyer with pot speed control

Installation:

The MegaPK is intended as a plug in replacement "chip" for the Jackson Harbor Press PK-x keyer chips OR for Tick/K8 keyer chips. The main consideration for installing the MegaPK is how to make space for the larger "footprint" versus the smaller 8 pin DIP keyer chips. To install the MegaPK, turn off the power to the keyer (or rig), remove the present keyer chip, insert the MegaPK in the keyer chip socket, power up the keyer and listen for the FB powerup greeting through the sidetone.

Orientation of the MegaPK: The top view of the MegaPK is shown in the diagram at the left. Pin 1 of the MegaPK corresponds to pin 1 of the keyer chip that the MegaPK is replacing. The MegaPK circuit board is roughly 5/8 inch by 7/8 inch.



The connections for an external pot (called the A/D pot) for speed/weight/tone control are also shown. Note that the ground connection to the pot can be made elsewhere in the keyer or rig. Connections to the pot wiper and pot power should be kept as short as possible to minimize radiated interference from the A/D conversion technique used by the MegaPK. Shielded wire might be used to provide the connections to the pot power and pot wiper (as well as the ground for the pot). Note that the power pad shown at the top of the MegaPK diagram should NOT be connected to the pot, this pad is used in the PIC programming process. If desired, a ground connection can be made on the underside of the MegaPK to the middle pin of the resonator. Note that the pot value isn't critical, 100K linear is recommended.

When installing the MegaPK in a radio such as the Norcal 20 / Red Hot Radio, it may be necessary to bend components out of the way of the MegaPK. C92 and C103 (10 uf electrolytic radial capacitors) in the Norcal 20 may need to be bent slightly. Also, verify that any components beneath the MegaPK do not touch the MegaPK circuit board.

The MegaPK is also "thicker" or higher in profile than the keyer chips it replaces. It may be hard to install the MegaPK in a keyer in a slim container such as a Sucrets or Altoids box. The standoff/s used to attach the keyer circuit board to the keyer case could be replaced with shorter standoff/s to gain a little "headroom".

Operation: General notes on using the switches to control the keyer: To give the keys multiple functions, multiple key-press combinations are used. Also, the memory switch can be pressed and released (PAR) OR pressed and held (PAH) for two seconds (duration

adjustable by user). This also gives more combinations of the three control switches (dit, dah and memory switch).

Generally, PAR is used for actions: send the code speed or send a memory. PAH is used for settings: change the code speed (no pot) or record a memory or enter command mode.

4 menus are used for setting various options - they are activated by a PAH of the memory switch alone or plus a simulpress of dit or dah or both. The menu selections are made by pressing either the dit or dah levers - you will then normally hear a corresponding dit or dah via the sidetone, the selection will be made and you are then returned back to normal keyer mode. In general, the operator can skip a menu item by a PAR of the mem switch.

Note that the keyer sidetone defaults to a frequency of about 990 Hz (pitch adjustable by user) for keyer commands such as the menu prompts, recording a memory or the FB sent at powerup. The default frequency for routine sending or practice is lower at about 600 Hz and can be set by the user from 250 to 990 Hz in 10 Hz increments.

A function table of the MegaPK keypress combinations:

keys used	PAR (press and release)	PAH (press and hold for 2 seconds)
mem switch	send mem 1	beacon start (BE) and record mem 1 (M?)
mem + dit	send speed or mem 3	paddle set of speed (S)
mem + dah	send CQ + callsign memory	tune mode (TU) and record callsign (?)
mem + both	send mem 2	command entry (CE) and record mem 2 (T?)

Powerup: Roughly one half second after powerup the keyer will send an FB through the sidetone to signal correct operation.

Speed Readout: The speed (in WPM) will be played through the sidetone if the mem switch is simulpressed with the dit lever and then both are released. I normally press the memory switch first and hold it, tap the dit lever and finally release the mem switch.

Speed Control and Menu: There are 3 options for controlling the speed of the MegaPK. Two different speed pot circuits can be used OR the speed can be controlled using the paddle.

The MegaPK has the option of using one of two speed pot circuits. The first speed pot is a legacy of the PK-x series of keyers and uses a 100K linear pot with an external .01 uf capacitor and a series 1k resistor. See the documentation for the PK-3 keyer for more information on this circuit. Normally, the legacy speed pot will be used only for keyers that presently use a PK-x keyer chip. It will be easier to add a speed pot to keyers that use the Tick / K8 keyer chip using the A/D pot mentioned below. With either control, the speed can be adjusted by just turning the pot. Maximum speed is 50 WPM, minimum speed is 5 WPM. Note that with the legacy speed pot, the minimum speed can be affected by component tolerances on the timing capacitor and the speed pot - see the pot calibration command item if a 5 WPM minimum speed is required. The pot position is read

continuously when the keyer is sending code, just before each dit, dah or space is sent. This allows the operator to adjust the code speed even in the middle of a memory send or record.

If you disconnect the pot from the circuit, the keyer will powerup at a default speed of 21 WPM. The speed can be adjusted by pressing and holding the memory switch along with the dit lever. Usually I PAH the memory switch and then tap the dit lever. After 2 seconds, the keyer will send an S (for speed set). Press the memory switch to advance to the next menu item without changing the speed. Or, pressing the dit lever will increase the speed by 1 WPM and send a dit. Pressing the dah lever will decrease the speed by 1 WPM and send a dah. You can continuously adjust the speed by holding either lever but note that if you run the keyer "off the scale" at either 5 or 50 WPM, the keyer will "wrap around" to the opposite speed extreme. Exit the speed adjust routine by pressing and releasing the memory switch - the code speed will be sent via the sidetone upon exit (see the SO command item below to turn off this speed send).

The second possible speed pot is the A/D pot (see connection information on page 1). The A/D pot must be selected from the command entry menu - it is not automatically searched for at power up as is the PK-x legacy speed pot. The A/D pot requires no calibration and it offers one feature not available with the legacy pot - the user can set a range of speeds covered by the A/D pot using the SR command (covered later). Note that this pot can also be used to control either the weight or sidetone frequency simultaneously while the legacy pot is controlling the keyer speed.

Mem + dit menu (PAR mem to advance to the next menu item)

	Menu item	pressing a dit:	pressing a dah:
S	Speed set from paddle	increases speed by 1 WPM	decreases speed by 1 WPM

Playing the CQ + Callsign Memory: Play the CQ memory by simulpressing and releasing the memory and the dah keys. I usually PAH the memory switch and then tap the dah lever - the memory starts to play after the memory switch is released.

General notes on playing any of the memories: A tap of either the dit or dah lever will stop the message play (except during the playing of /QRP). PAH the mem key during playback to pause the message at the end of the play of the current character, you can then send manually with the paddles and re-enter the message play with a PAR of the mem key. If the memory is empty an E will be sent via the sidetone.

General notes on recording Mem 1 and 2: Note that you can insert the callsign memory at any given point in the message by sending 6 dahs in a row. You can also insert a pause into the memory by recording the AS (di-dah-di-di-dit) character. Message play will stop when an embedded pause is reached - the paddle can then be used to send something manually - the message play can then be resumed with a PAR of the mem key. This is useful for inserting an RST or a serial number into a message. You can also embed a space of 6 dits in length by entering a special character of di-dah-dah-dah-dah-dah-dit. Note that

spaces do count as characters in the capacity of a memory. You can insert the callsign memory, pause or space multiple times - each insertion takes up one character in memory. DX operators, see the I command for alternate (7 element) characters for the pause and callsign insert.

Playing Mem 1: Play the memory with a PAR of the memory switch. The memory will start to play right after the memory switch is released. Mem 1 is preloaded with the callsign memory at powerup but can be re-recorded using the M? Item in the mem menu (see M? explanation).

Recording Mem 1 and Menu: The Mem 1 menu can be entered by a PAH of the mem switch (alone) for 2 seconds. After 2 seconds the keyer will enter the menu (you'll hear a BE).

Mem switch menu (PAR mem to advance to the next menu item)

	Menu item	pressing a dit:	pressing a dah:
BE	BEacon mode	starts the beacon going	toggle powerup beacon on/off
M?	Record Mem 1	records a dit	records a dah

BE - Beacon Mode: Beacon mode will send the contents of mem 1 continuously with a selectable (see DD command on next page) pause in between each play of the memory. Start the beacon by pressing the dit lever - the beacon starts to play. Exit beacon mode by tapping the dit or dah lever. Pressing a dah will toggle the powerup beacon mode on and off - default is off. The powerup beacon mode will start the beacon right after the FB is sent after turning on the power to the keyer.

M? - Record Mem 1: Start sending your message. when complete, press the mem key. The memory is 99 characters long - recording will terminate automatically after the 99th character.

Playing Mem 2: First, hold the mem switch down, next, squeeze both paddle levers (they both must be down at the same time) then release the paddle and finally release the mem switch before 2 seconds elapse. The memory will start to play right after the mem switch release.

Recording Mem 2 and Menu: The second message of up to 126 characters long can be recorded by a PAH of the mem switch and both paddle levers for 2 seconds. Hold the mem switch down, then squeeze both paddle levers simultaneously (they both must be down at the same time), then release the paddle, keep holding the mem switch until after 2 seconds the keyer will send **T?**. Mem 2 can now be recorded. When recording is complete, press the mem switch. If you wish to skip recording just press and release the mem switch alone to proceed to the next menu item:

Mem + both menu (PAR mem to advance to the next menu item)

	Menu item	pressing a dit:	pressing a dah:
CE	Command Entry	enter commands via the paddle	enter commands via the paddle
T?	Record mem 2	records a dit	records a dah

CE - Command Entry:

This item is the primary way to change the various parameters of the MegaPK. There are two basic actions with CE, first the user can query the keyer about the state of any parameter by sending the one or two character parameter abbreviation by itself. Second, the user can change the parameter setting by sending the one or two character parameter abbreviation along with an N (for oN) or an F (for oFf). OR, the user can send the parameter along with a numerical entry (such as weight percentage or tone frequency). The available commands are listed here in two sections, the first are the numerical entry commands, the second are the on/off commands. Each of the commands is also explained by itself.

Note that the keyer will default to exiting the CE loop after a command but staying in the loop after a query. Also note that the keyer will send an error (8 dits) if there is a problem with the command as sent. The user must eliminate extra space between characters of a command (avoid "Farnsworthing") or the keyer will misinterpret the command as a query or simply send an error.

Numerical entry commands:

Command	Query	Explanation
Txx	T	Sidetone frequency, xx => 25 to 99 (250 - 990 Hz), default is 600 Hz
Wxx	W	Weight percentage, xx => 20 to 80 percent, default is 50 %
DDxx	DD	Debounce Delay, xx => 01 to 99 ms, default is 25 ms
BDxx	BD	Beacon Delay time, xx = 00 to 60 seconds, default is 0
CQx	CQ	number of CQs set, x = 0 to 7 where 0 sends no CQ, just callsign, default is 4
RPx	RP	number of cq + callsign RePeats, x = 1 to 4, default is 1
CRx	CR	number of Callsign Repeats, x = 1 to 4, default is 2
CTxx	CT	Command Tone frequency set, xx = 25 to 99, default is 99
CSxx	CS	Command Speed set, xx = 05 to 50, default: 0 (regular)
Hxx	H	press and Hold delay time, xx = 01 to 99 (tenths of second) - default is 20 (2 seconds)
SRxxyy	SR	A/D pot Speed Range set, xx = low limit, yy = high limit default range is 5 to 50 wpm

Txx / T - sideTone frequency set / query: Txx allows the operator to set the sidetone frequency for normal operation. The frequency can range from 250 Hz to 990 Hz - the frequency is entered in 10 Hz steps (drop the third digit). A frequency entered below 25

results in a 250 Hz sidetone setting. A T sent alone will result in the sending of the current sidetone frequency setting followed by a loop back to CE.

Wxx / W - Weight set / query: Consider a dit or dah as the mark (key down) plus the space (key up) after it. Normally a dit mark and space are equal in length - this 1:1 ratio can be expressed as a percentage (50%) mark (key down) duty cycle. Wxx allows the operator to vary this percentage from 20 to 80 percent. Lowering the duty cycle results in a "lighter" sound - Increasing the duty cycle results in a heavier sounding element. Note that the percentage refers to the dit, but also affects the dah, too. A dah can be thought of as three dit marks (key down) run together followed by a dit space (key up). The weight setting affects only the third dit mark (key down) and the following dit space of the dah. Code speed is unaffected by the weight setting, the same number of dits and dahs will be sent at a given code speed, they will just sound differently. A W sent alone will result in the sending of the current weight setting followed by a loop back to CE.

DDxx / DD - Debounce Delay set / query: DD allows the operator to set the debounce delay time for the straight key modes. Mechanical telegraph keys and iambic paddles have contacts which will bounce for a time after the switch is actuated or released. DD defaults to a 25 ms debounce delay time before checking a switch for make/break. This allows the operator to send Morse code at up to 49 WPM or so. However, this delay may be either too short (key bounces for longer than 25 ms) or too long (external keying apparatus may operate at higher than 49 wpm). The Debounce Delay may be set from 0 to 99 ms. To change the debounce delay to nine milliseconds, enter: DD09 (the leading zero is required for debounce delays of less than 10 ms). Note that if the delay is set to zero, the actual resulting delay will be more than 250 ms long which will result in a maximum code speed of less than 5 wpm. A DD sent alone will result in the sending of the current debounce delay setting followed by a loop back to CE.

BDxx / BD - Beacon Delay set / query: The beacon delay defaults to a single word space (0 seconds). The maximum beacon delay is 60 seconds. After entering a BD query, the keyer will send the current beacon delay length through the sidetone. To change the beacon delay to five seconds, enter: BD05 (yes, the zero is needed for delays of less than 10 seconds, including 00). Note that the delay times are approximate, roughly 10% long.

CQx / CQ - number of CQ set / query: A `CQ DE callsign K` sequence can be sent by the user with a multipress and release of the dah and mem switches. The CQ set/query allows the user to specify the number of CQs sent in this sequence from 1 to 7. If the number of CQs is set to 0 (zero), the `CQ DE callsign` sequence is turned off and just the callsign memory will be sent with a mem + dah PAR. If 8 or 9 callsigns are set an error will be sent and CE is re-entered. If 10 or more callsigns are set, the keyer will accept the first (tens) digit as the number of CQs to be sent. A CQ sent alone will result in the sending of the current number of CQs setting followed by a loop back to CE.

RPx / RP - number of RePeats of the CQ sequence set / query: A `CQ DE callsign` sequence can be sent by the user with a multipress and release of the dah and mem switches. The RP set/query allows the user to specify the number of times the sequence is sent from 1 to 4. If 5 to 9 repeats are set an error will be sent and CE is re-entered. If 10 or more repeats are set, the keyer will accept the first (tens) digit as the number of repeats. An RP sent alone will result in the sending of the current number of sequence repeats set followed by a loop back to CE.

CRx / CR - number of Callsign Repeats of the CQ sequence set / query: A `CQ DE callsign K` sequence can be sent by the user with a multipress and release of the dah and mem switches. The CR set/query allows the user to specify the number of times the callsign is sent from 1 to 4. If 5 to 9 repeats are set an error will be sent and CE is re-entered. If 10 or more repeats are set, the keyer will accept the first (tens) digit as the number of repeats. A CR sent alone will result in the sending of the current number of callsign repeats set followed by a loop back to CE.

CTxx / CT - Command sideTone frequency set / query: CTxx allows the operator to set the sidetone frequency for command entry or annunciation. The frequency can range from 250 Hz to 990 Hz - the frequency is entered in 10 Hz steps (drop the third digit). A frequency entered below 25 results in a 250 Hz sidetone setting. Setting a command sidetone frequency completely different than the normal sidetone frequency makes it easy to distinguish when the keyer is in command mode versus normal mode. The default for CT is 99 (990 Hz). A CT sent alone will result in the sending of the current command sidetone frequency setting followed by a loop back to CE.

CSxx / CS - Command Speed set / query: CSxx allows the operator to set the speed for command entry or annunciation. The default for CS is 0 which means that the command speed is the same as the normal speed (adjustable by the pot or paddle). To change the command speed to nine wpm, enter: CS09 (the leading zero is needed for speeds of less than 10 wpm, including 00). The allowable command speeds range from 5 to 50 wpm with the addition of 00 for the default tracking command speed. Setting a command speed completely different (usually slower) than the normal speed can make it easier to enter commands or understand keyer annunciations such as the code speed. A CS sent alone will result in the sending of the current command speed setting followed by a loop back to CE.

Hxx / H - press and Hold delay set / query: The press and hold delay defaults to 2 seconds. Some users may find this either too long or too short, so the delay can be set from .1 to 9.9 seconds. After entering an H query, the keyer will send the current press and hold delay time through the sidetone. To change the press and hold delay to .9 seconds, enter: H09 (yes, the zero is needed for delays of less than 1 second). Note that if the press and

hold delay is set to 00, the actual press and hold delay will be well over 20 seconds. Note that the delay times are approximate.

SRxxyy / SR - a/d speed pot Speed Range set / query: SRxxyy allows the operator to set the speed range of the a/d speed pot. The default for SR is 5 to 50 wpm. To change the speed range to 9 to 29 wpm, enter: SR0929 (the leading zero is needed for speeds of less than 10 wpm). This command has no effect on the speed range of the legacy PK-x speed pot. An SR sent alone will result in the sending of the current a/d pot speed range setting followed by a loop back to CE.

Table of On / Off Commands:

Command	Query	Explanation
E		Exits command entry mode (PAR the mem switch to advance to T?)
5N 5F	5	5 ditdah tune mode - hold both paddles for 5 dit/dah cycles, enter tune, default: off
TMN TMF	TM	Third Memory on / off (the mem + dit press will send this memory) , default: off
BN BF	B	Bug mode (Ele-bug) oN or oFf (dit is normal, dah is straight key) , default: off
UN UF	U	Ultimatic mode oN or oFf (non-iambic dual lever keying mode),default: off
LN LF	L	Live recording mode oN or oFf, default: off
PN PF	P	Practice mode oN or oFf (keyer output is turned OFF) , default: off
AN AF	A	Iambic mode A oN or oFf (when mode A is off, mode B is ON), default is off (mode B)
RN RF	R	Reverse paddles oN or oFf (the dit lever becomes the dah lever),
STN STF	ST	SideTone oN or oFf (sidetone will still occur during commands),default: on
SFN SFF	SF	Sidetone Float oN or oFf (reduces thump in transceiver installations), default: off
DIN DIF	DI	DIt memory oN or oFf, default: on
DAN DAF	DA	DAh memory oN or oFf, default: on
AUN AUF	AU	AUtospace oN or oFf, default: off
SSN SSF	SS	Speed Send after paddle speed set oN or oFf, default: off
PON POF	PO	legacy POt speed control oN or oFf, default: on
KN KF	K	Key down beacon delay oN or oFf, default: off
BAN BAF	BA	Beacon Alternate oN or oFf, default: off
QN QF	Q	/QRP at the end of CQ oN or oFf, default: off
MN MF	M	Multiple commands oN or oFf, allows CE loop for commands, default: off
FN FF	F	Fast command entry, turns off the CE, ON => E, OFF => T, default: off
YN YF	Y	a/d tone pot oN or oFf, default: off
ZN ZF	Z	a/d weight pot oN or oFf, default: off
	V	sends firmware version
XN XF	X	A/D Speed pot oN or oFf, default: off
SKN SKF	SK	Straight Key input oN or oFf, default: off
IN IF	I	International character set on /off, default: off
CN CF		Calibrate legacy speed pot oN or oFf, default: off
SPN SPF	SP	Stuck Paddle timeout test oN or oFf, default on
BCN BCF	BC	iambic mode B for Cmos super keyer, default off

E - Exit command entry mode: If the operator enters an E alone the keyer will exit the command entry (CE) routine. An alternate way to exit the CE routine is to PAR the mem

switch, this will advance to the T? menu item (record the mem + both memory), another mem PAR will exit T? without .recording and re-enter the normal keying mode.

5N 5F / 5 - 5 ditdah tune mode oN / oFf / query: 5N allows the operator to turn on the 5 ditdah tune mode (quick tune). Quick Tune is a quick way to enter tune mode by sending 5 (or more) ditdahs in a row (hold both paddles for at least 5 ditdahs or dahdits) and then release the paddles - the MegaPK will then enter tune mode (keyer output / sidetone on). Since there aren't any normally used characters of this length, this mode should not be actuated during normal sending. Exit tune mode with a tap of the dit or dah paddle. 5F allows the operator to return to the default state of having the 5 ditdah mode off. 5 alone will result in the keyer sending the current status of the 5 ditdah mode, ON or OFF. This mode was requested by a PK-3 user as a quick way to put his transmitter into tune for adjusting his antenna tuner.

TMN TMF / TM - Third Memory oN / oFf / record / disable query: This option enables then records OR disables an optional 3rd memory. Memory 2 is split into two 63 character memories. This new third memory is then played with a mem+dit PAR simulpress. After a TMN command is entered the keyer will send O? to signify that recording can start. Record memory 3 in the same fashion as the other 2 memories. The speed send is moved into the mem+dit menu as the first item. Press either dit or dah to exit the mem + dit menu after the speed has been sent.

BN BF / B - Bug mode oN / oFf / query: Bug mode (also known as Ele-bug) is where dits are sent normally but dahs are sent like a straight key. A BN will turn on bug mode, BF turns it off (default) and B alone inquires whether bug mode is currently on or off. Note that bug mode is mutually exclusive with straight key mode - if the operator attempts to enter bug mode when SK mode is on, the keyer will send an error.

UN UF / U - Ultimatic mode oN / oFf / query: Ultimatic is a dual lever keying mode which predates the now popular iambic A/B modes. Ultimatic differs in this way from iambic: instead of an alternation between dit and dah when both levers are pressed, ultimatic will output the element of the last lever pressed. This can be handy for sending characters such as the ? (press and hold the dit for 2 dits, then while keeping the dit pressed, press the dah for 2 dahs, then release the dah for the last two dits). Note that Ultimatic setting takes precedence over either the iambic modes. A UN will turn on ultimatic mode, UF turns ultimatic off (default) and U alone queries the keyer as to whether ultimatic mode is currently in use.

LN LF / L - Live or Dead recording oN / oFf / query: Normally, the memory or callsign will be recorded by the user off the air (dead) but sometimes it's desirable to be able to record a message on the air (live). LN will turn on live recording, LF turns it off (default) and L alone will inquire whether the keyer is currently in live recording mode or not.

PN PF / P - Practice mode oN / oFf / query: Practice mode is where the output transistor is not keyed but the sidetone is retained. This allows the user to get used to the

MegaPK without having to disconnect the rig. Note that practice mode takes precedence over the ST menu item - even if the sidetone is turned off with ST, turning on the practice mode will re-enable the sidetone. PN turns on practice mode, PF turns it off (default) and P alone inquires whether the keyer is currently in practice mode.

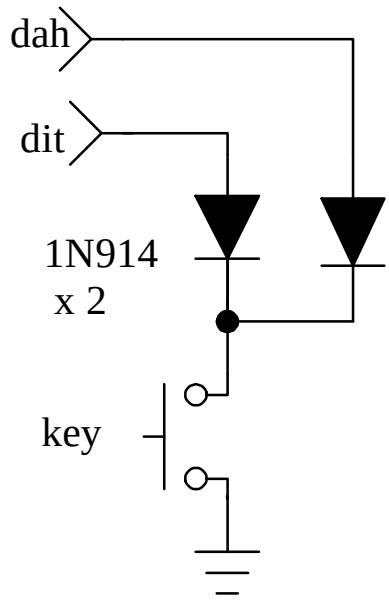
AN AF / A - Iambic mode A or B oN / oFf / query: The A mentioned above signifies the mode A/B select menu item. The iambic mode of the keyer can be set to either mode using this routine. Check the JHP web site for an Acrobat (.pdf) file which explains the difference between the A and B keying modes. AN turns on mode A, AF returns the keyer to mode B (the default) and A alone inquires whether the mode A is on or off. Note that either iambic mode is overridden if ultimatic mode is turned on.

RN RF / R - Reverse paddle mode oN / oFf / query: Reverses the dit and dah levers (easier than resoldering a jack). RN reverses the dit and dah paddles, RF returns the dit and dah paddles to the default (wired) state and R alone inquires whether the paddle reverse has been turned on.

STN STF / ST - SideTone oN / oFf / query: The sidetone will still be engaged during any menu or recording entry and during practice mode even if it is turned off with this menu item - this item allows the user to employ his rig sidetone. STN turns on the keyer sidetone (default), STF turns off the keyer sidetone and ST alone inquires whether the sidetone is now on or off.

SFN SFF / SF - Sidetone Float oN / oFf / query: The reason for floating the sidetone pin is to minimize thump from the sidetone when the MegaPK chip is used to inject sidetone into a rig audio chain (example: 38 Special or Norcal 20). The float should normally be DISABLED when using a piezo sidetone in a PK-x keyer to prevent excessive power supply current in the sleep mode. SFN turns on the sidetone float condition, SFF turns the sidetone float off (default) and SF inquires whether the sidetone float is now on or off.

SKN SKF / SK - Straight Key oN / oFf / query: The circuit at left may be used along with this command option to allow the connection of a telegraph or "straight" key to the MegaPK. The diodes are used in effect to close both the dit and dah paddles at exactly the same time. The diodes also isolate the dit and dah inputs from each other. This allows the MegaPK to distinguish between a key press and a dit/dah squeeze since it is hard to close the contacts of both the dit and dah paddles at exactly the same instant. This option is mutually exclusive with the Bug mode. If an SKN is entered with Bug mode already enabled, the MegaPK will send an error character. Contact bounce on the key can be compensated with the DD set option. This feature was made optional so that if the user finds that normal paddle squeezes result in a key press rather than a dit/dah combination, the straight key mode can be turned



off. This feature was suggested by a PK-3 user based on his experience with the Elecraft K2 transceiver. SKN turns on the straight key mode, SKF turns it off (default) and after an SK alone, the keyer will send on or off to indicate the current state of SK.

DIN DIF / DI - DIt memory oN / oFf / query:
DAN DIF / DA - DAh memory oN / oFf / query: Normally the keyer has both dit and dah memories enabled - at higher speeds (30 WPM or more), some users may like "less" memory. The dit and dah memories are evident if the dit and dah paddles are pressed rapidly in order at low speed. If the dah memory is on, an A will be sent. If the dah memory is off, an E (single dit) is sent. DIN turns on the dit memory (default) - DAN turns on the dah memory which is also the default state of the keyer. DIF or DAF will turn off the respective memory and DI or DA alone will query the keyer as to whether the memory is now on or off.

AUN AUF / AU - AUtospace oN / oFf / query: The autospace feature inserts a character space (1 dah in length) automatically if the operator has not pressed a paddle switch 1 dit space after the last dit/dah sent. This feature is always on in the memory record routines (needed for the recording process). An AUN turns on the autospace mode, AUF turn it off (default) and AU alone asks the keyer whether autospace is now on or off.

SSN SSF / SS - Speed Send oN / oFf / query: This menu item controls the speed send at the end of the paddle speed set menu item. This was requested by a PK-3 user who felt the speed send took too long and was not needed. An SSN will turn on the speed send (default), an SSF will turn it off and SS alone inquires as to the current status (on or off) of speed send.

PON POF / P - Select legacy Pot or Paddle speed control oN / oFf / query: If the keyer is accidentally put into the paddle speed control mode the legacy pot speed control can be resumed with this command. Note that the a/d speed pot takes precedence over the legacy speed pot - if an XN was done previously, a PON will have no effect on the legacy pot speed control. The keyer defaults to the legacy pot on (if it is connected) - a POF turns off the pot speed control. PO alone will ask the keyer if the legacy pot speed control is now on or off.

KN KF / K - Key down beacon delay oN / oFf / query: Enter KN to turn oN the key down beacon delay mode. This will enable the sending of a constant key down during the interval between sending the beacon message. Enter KF to turn oFf (return to the default) the key up beacon delay. K alone asks the keyer if the key down beacon is now on or off.

BAN BAF / BA - Beacon Alternate between mem 1 and mem 2 mode oN / oFf / query: BAN will turn oN alternating the beacon between mem 1 and mem 2. BAF will turn oFf the alternation - the beacon will repeat mem 1 only. BA alone asks the keyer if the beacon alternate mode is now on or off.

QN QF / Q - /QRP after last callsign oN / oFf / query: This option will allow the operator to append a /QRP to the last callsign sent

for example: `CQ CQ CQ CQ DE WB9KZY WB9KZY/QRP K`

Enter QN to select the /QRP option, enter QF to return to the default non-/QRP CQ. Q alone will ask the keyer if the /QRP option is now on or off.

MN MF / M - Multiple command entry oN / oFf / query: MN will turn on the multiple command entry mode - after a command is entered the user will hear CE which means that another command can be entered. This can be handy if a number of changes are required at the same time. Exit the multiple command mode with an E. MF turns off the multiple command mode (default) - after a command is entered the keyer immediately returns to normal keying mode. M alone asks the keyer whether the multiple command mode is on or off.

FN FF / F - Fast command entry oN / oFf / query: FN turns on the fast command mode where the sending of CE is eliminated - also, now the keyer will send an E instead of ON and the keyer will send a T instead of OFF. The operator still needs to send an N or F to perform the on or off command entry. FF turns off the fast command mode and F alone asks the keyer to send either the on or off state of fast command mode.

YN YF / Y - a/d tone pot oN / oFf / query: In addition to being able to set the sidetone frequency using the T command entry, the operator can connect a pot to the a/d pot input of the MegaPK and vary the sidetone of the keyer at will, in the same way the speed can be set using the legacy or a/d speed pot. YN turns on the a/d tone pot (it will also turn off the a/d weight pot or a/d speed pot if either was previously in use). YF turns off the a/d tone pot (default) - the current tone setting will be saved when the a/d tone pot mode is exited. Y alone asks the keyer whether the tone pot is now on or off. Note that the legacy speed pot can be used along with the a/d tone pot at the same time.

ZN ZF / Z - a/d weight pot oN / oFf / query: In addition to being able to set the weight using the W command entry, the operator can connect a pot to the a/d pot input of the MegaPK and vary the weight of the keyer at will, in the same way the speed can be set using the legacy or a/d speed pot. ZN turns on the a/d weight pot (it will also turn off the a/d tone pot or a/d speed pot if either was previously in use). ZF turns off the a/d weight pot (default) - the current weight will be saved when the a/d weight pot mode is exited. Z alone asks the keyer whether the weight pot is now on or off. Note that the legacy speed pot can be used with the a/d weight pot at the same time.

V - Version query: V asks the keyer to send the current version of the firmware.

XN XF / X - a/d speed pot oN / oFf / query: In addition to being able to set the code speed using the legacy speed pot or the paddle (S mem + dit menu item), the operator can connect a pot to the a/d pot input of the MegaPK and vary the speed of the keyer at will. XN turns on the a/d speed pot (it will also turn off the a/d tone pot or a/d weight pot if either was

previously in use). XF turns off the a/d speed pot (default). X alone asks the keyer whether the a/d speed pot is now on or off. Note that the legacy speed pot does nothing when the a/d speed pot is selected.

IN IF / I - International character set oN / oFf / query: Per a user of the PK-3, some of the special characters used in the PK-3 for storing callsign insertions and pauses were identical to some Morse characters used by DX operators. IN will use alternate characters (7 code elements long) that are not used by DX operators, so that they can store these special characters in a memory. IF will return the keyer to the default character usage and I alone will ask the keyer to send on or off depending on whether the international characters set usage is on or off. The embedded word space character is now a dit-dah-dah-dah-dah-dah-dit (JG) for either character mode.

Table of normal and international embedded characters

Normal Character mode	International Character mode	character function
di-dah-di-di-dit (AS)	di-di-di-dah-di-di-dit (7 elements)	embedded pause
dah-dah-dah-dah-dah-dah (6 dahs)	dah-dah-dah-di-dah-dah-dah (7 elements)	embedded callsign

CN CF - Calibrating the Pot speed control oN / oFf: Due to the variation in capacitors and pots it is possible that the maximum setting of the pot will result in a minimum speed higher than 14 WPM. CN will compensate and store an updated calibration value. Before entering CN, be sure to turn the legacy pot to the minimum speed. Then enter CN to go into the calibration routine - you then may hear one or more dits and the keyer will exit from the menu. If the pot calibration is run with the pot above midscale, the keyer may jump into paddle speed control if the pot is then turned below mid-scale after calibration is complete. It won't be possible to exit paddle speed control because the calibration value is too low. CF will restore the default powerup calibration value and thus allow normal pot speed control again. There is no corresponding query to the calibrate.

SPN SPF / SP - Stuck Paddle timeout oN / oFf / query: This item puts the keyer to sleep after 128 consecutive dits, dahs or didahs - which normally will only occur when one or both of the paddles are stuck on. SPN turns on the stuck paddle timeout test (default), SPF turns off the stuck paddle timeout test and SP alone inquires whether the stuck paddle test is now on or off.

BCN BCF / BC - iambic mode B emulation of Cmos super keyer: This item attempts to emulate the iambic B keying mode of the CMOS Super Keyer from QST of October of 1981. The difference between the default iambic mode B and the CMOS Super keyer iambic mode B is that dit input is ignored during the first 1/3 of a dah period. This is supposed to allow the operator a little more time to "get off" the dit paddle without latching in another dit after the dah currently being sent.

Recording the Callsign Memory or using the Menu: A callsign of up to 13 characters long can be recorded. This can be handy for things like: WB9KZY/9 . The callsign memory menu is entered by simulpressing the memory and the dah keys and holding them for 2 seconds. I usually PAH the memory switch and then tap the dah key.

Mem + dah menu (PAR mem to advance to the next menu item)

	Menu item	Pressing a dit:	Pressing a Dah
TU	TUne mode	starts/ends key down	advance to ? menu item
?	Record callsign memory	records a dit	records a dah

TU - Tune mode: After 2 seconds the keyer will send TU. Press the dit lever to enter tune mode (key down). Exit tune mode by a PAR of dit or dah.

? - Record the Callsign Memory: The callsign can now be recorded. When complete, press the memory switch. The routine will be exited automatically after the 13th character is sent. The callsign memory is saved in EEPROM - it will still be there even if power is removed.

Notes:

To perform a full keyer reset (all memories and parameters to their default value)s:

1) remove power to the keyer
2) press the dit or dah (you may hear a short blip on the sidetone)
3) powerup the keyer with the mem switch depressed until the FB is sent.
4) release the mem switch - the MegaPK should now be reset to it's defaults

The bypass capacitors across the power and ground circuits of the keyer can sometimes retain enough voltage to prevent the above keyer reset from being successful. If this occurs, power off the keyer and then short out the bypass capacitors (including the ones on the input of any voltage regulators). This will allow the full keyer reset to take place.

Most of the features added in the MegaPK keyer were the result of suggestions from PK-3 users. Please feel free to email with any questions, comments, suggestions or problems with the MegaPK- email to: jacksonharbor@att.net

Thanks for choosing the MegaPK and
Best Regards,

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