PRICE $1.00

OPERATION MANUAL FOR ELECTRONIC FEATHER TOUCH KEY

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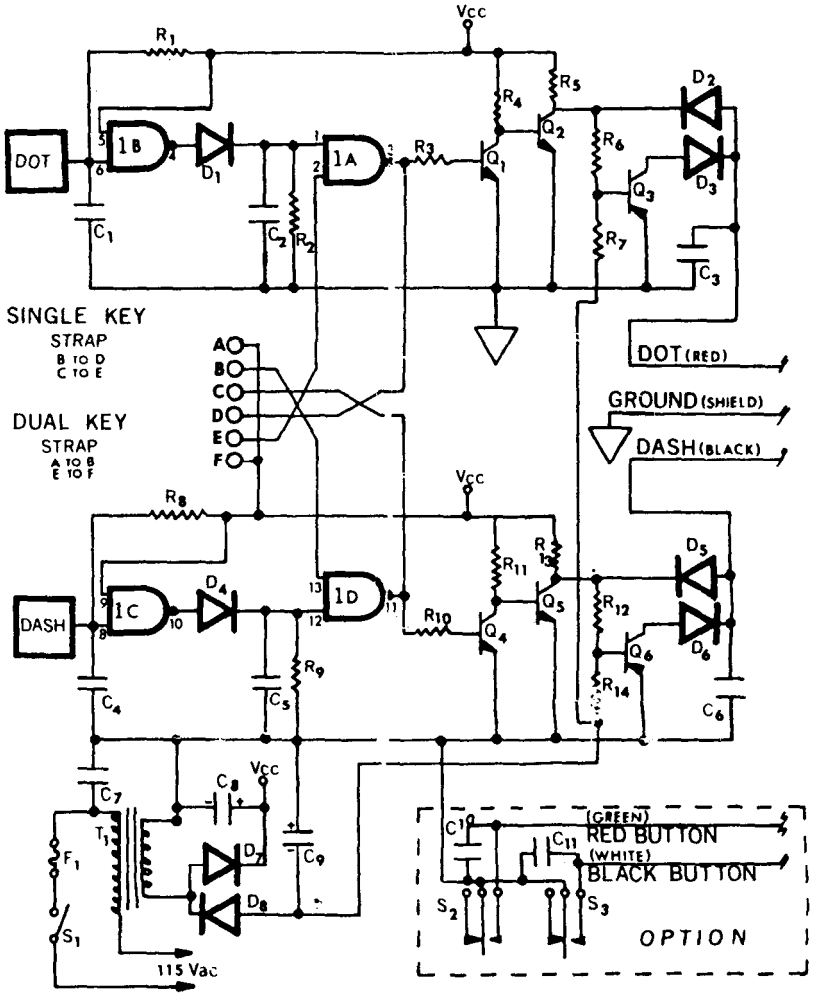
INTRODUCTION

The Electronic Feather Touch Key is completely solid state. It has been designed to drive the most demanding electronic keyers by the mere touch of fingers to the paddles. Output transistor drivers are provided for keying keyers which operate with negative or positive voltage grounds. Two identical circuits are provided, one comprising the electronics for the DOT paddle, the other for the DASH paddle. Strappable connections between the DOT and DASH electronics are provided to allow the key to function as a Single Paddle or Dual Paddle key. Each circuit consists of two high input impedence COS-MOS NAND gates with associated NPN and PNP transistor. The COS-MOS NAND gates are used to convert the mechanical touch of a finger to a suitable electrical signal for the output transistor drivers. The output drivers are designed to directly drive the input circuitry of any digital keyer using positive or negative voltage grounds.

TWIN KEY OPERATION of the unit will be discussed covering only one of the identical paddle assemblies. The input to Pin 6 of G1B under static condition is from a high resistance voltage source, R1 to Vcc. The output, Pin 4, of G1B thus is a 0. G1A has a high resistance 0 on Pin 1 through R2 to ground. Pin 2 of G1A is a 1 from the DUAL KEY strapping, terminal E to F. Pin 3 is a 1 and causes transistor Q1 to conduct placing a 0 at the base of Q2, not allowing Q2 to conduct. When Q2 is not conducting the voltage divider of R5, 6, 7 establishes a positive voltage at the base of Q3, not allowing Q3 to conduct. When a finger touches the DOT paddle two conditions may occur. One is that G1B establishes a steady 1 on its output, Pin 4. This will be the case if a good finger ground touches the DOT paddle. A good finger ground will normally result, however, it can be improved upon by allowing the body or keying hand to physically touch an AC ground such as the case of the key or keyer. Second is that Pin 4 of G1B pulses at a 60 Hertz rate. This will be the case if the finger has a high resistance path to the AC ground. That is G1B responding to the AC voltage appearing in the operating hand. In case number one, the steady 1 on Pin 4 of G1B will pass through D1 onto Pin 1 of G1A. This 1 will force Pin 3 of G1A to a steady 0. In case number two, the 1 pulses at Pin 4 of G1B will pass through D1 onto Pin 1 of G1A, via the filter network established by C2 and R2. The fast charge and slow discharge rate of C2 establishes a steady 1 on Pin 1 of G1A even though the output of G1B is pulsing. Thus, in both cases, a steady 0 appears on Pin 3 of G1A. The 0 then on the base of Q1 allows the collector of Q1 to become a 1. The 1 causes Q2 to conduct and the collector of Q2 becomes a 0. If the key is connected to a keyer with a negative ground the 0 would pass through D2 and place a 0 on the positive voltage of the keyer's input circuit. If the key is connected to a keyer with a positive ground D2 would be ineffective. However, the 0 at the collector of Q2 establishes a new voltage divider consisting of only R6 and R7. The voltage at the base of Q3 at this time is negative and allows Q3 to conduct. The 0 at the collector of Q3 passes through D3 and places a 0 on the negative voltage of the keyer's input circuit. Capacitors C1 and C3 are for RF by-passing.

SINGLE KEY OPERATION is the same as that discussed above under Twin Key Operation with the following exceptions: When the key operates in the Twin Key mode, a steady 1 is applied to Pin 2 of G1A and Pin 13 of G1D. This voltage allows these two gates to function independently of one another. When the key is strapped to operate in the Single Key mode, the output of G1A is fed to one input of G1D and the output of G1D is fed to one input of G1A. This latching arrangement prevents an output from either gate if a previous gate is activated. That is, if the DASH paddle is touched, Pin 11 of G1D will be at a 0, this 0 via strap C and E is applied to



PARTS LIST

R1,2,8,9	10,Meg. ohm, 1/2 watt
R3,4,7,10,11,14	10,000 ohm, 1/2 watt
R5,6,12,13	3,300 ohm, 1/2 watt
D1,4	1N914 or equivalent
D2,3,5,6,7,8	Silicon Power Diode
Q1,2,4,5	2N 5129 or equivalent
Q3,6	2N5143 or equivalent
C1,4,7	0.001 MFD, Disk
C2,3,5,6,10,11	0.002 MFD, Disk
C8	40 MFD, 15 volts
C9	10 MFD, 15 volts
IC1	4011AE COS/MOS
F1	1/4 amp
S1	SPST On/Off Switch
S2,S3	SPDT P.B.Switch (Option)
T1	6.3 volt transformer

Pin 2 of G1A. If the DOT paddle is now touched, Pin 3 of G1A remains at a 1, even when Pin 1 goes to a 1, due to the 0 on Pin 2 from G1D. The DOT output thus is prevented, and will be until the DASH paddle is released and the 1 restored to Pin 2 of G1A.

OUTPUT of each key paddle is through two diode protected open transistor collectors, an NPN and PNP. The PNP transistor functions when the key is used with a positive ground keyer and is capable of keying up to negative 20 volts at 20 mA. The NPN transistor functions when the key is used with a negative ground key and is capable of keying up to positive 12 volts at 20 mA. If the key is used to drive an inductive load, voltage spikes developed by the inductive load must be suppressed. Failure to provide suitable suppression will permanently damage the output transistor drivers.

INTERNAL KEY STRAPS on the printed circuit board allow the user a choice between a Single Paddle or Twin Paddle Key. Unless otherwise requested, the key comes from the plant strapped to function as a Twin Paddle Key, that is, a strap between terminals A-B and E-F. To convert to a Single Paddle Key, strap terminals B to D and C to E.

The Option available with the key provides two single pole double throw push button switches. The switches are used for manual starting and stopping of memory messages in the Data Engineering, Inc. Memory-Matic Keyers, or can be connected as a remote TUNE switch, etc.

KEY CONNECTION: The standard key is equipped with a two-wire shielded cable, while the key with option has a four-wire shielded cable. The color-coded conductors of the cable and their use is shown in the schematic diagram. In both cases, the shield serves as the ground between key and keyer. The Red wire in the cable is connected to the DOT input of the remote keyer while the Black wire is connected to the DASH input. (The red and black wires can be reversed if left-handed operation is desired.) In those keys with the option, the Red button is connected to the Green wire in the cable and in turn should be connected to Pin 2 of the five-prong plug provided with the Data Engineering, Inc. Memory-Matic Keyers. The Black button is connected to the White wire and should be connected to pin 4 of the same five-prong plug.

RF IMMUNITY is provided by the use of shielded cable. Additional suppression is provided by the use of by-pass capacitors on each cable conductor and paddle. If required, by-pass capacitors should be added to the terminated end of each cable conductor.

ERRATIC KEYING: The input of the key is by a physical touch of the twin paddles. The touch of a paddle reduces the input voltage of the COS-MOS NAND gates sufficiently to cause their conduction.

If the voltage is not reduced sufficiently to cause adequate conduction, erratic keying will result. This condition, however, can be corrected by reversing the AC power plug to the key.

NOTE: The new paddle design with adjacent grids, requires touching of two of the adjacent grids simultaneously for proper keying operation.