MicroStar 2000
PIC 18F8722 Encoder Upgrade
March 16, 2008

This document describes the installation of the PIC 18F8722 Adapter PC board in the MicroStar 2000 version 3.0 Encoder PC board. The Adapter is a small PC board with the 18F8722 PIC and a few discreet components. The Adapter is installed in the position occupied by the PIC 17C766 on the rev 3.0 PC board.

Instillation of the Adapter requires only a few steps but a great deal of care is required to complete these operations without damaging the Encoder PC board. Below are the steps to be performed:

1.) Remove the Encoder PC board from your transmitter.
2.) Remove the PIC 17C766 from its IC socket.
3.) Remove the PIC 17C766 IC socket. This is the most difficult step of this procedure. I like to use solder-wick to "pull" the solder from the IC socket pins and enabling the removal of this socket. There are a number of "solder sucker" tools available to remove the solder from the socket pins. Please use a procedure that you have found successful. You need to preserve all of the PC board pads for use by the adapter so be very careful during this process. You will not need this socket so do not worry about damage to the socket.
4.) Install pin strips in the Encoder PC board where the IC socket was located. These pin strips will be used to connect the Adapter to the Encoder.
5.) Place the Adapter over the pin strips and solder in place. Please reference figure 1 for the orientation of the Adapter PC board.
6.) Re-install the Encoder PC board into your transmitter.
7.) The first operation you need to perform after powering up Encoder with the new Adapter is a Joystick calibration.
8.) Finished!

Below is a list of parts you will need to perform this upgrade:

1.) Adapter PC board. This is an assembled and tested Adapter ready to install in your rev 3.0 Encoder. Available from *GAA Custom Electronics* at www.mstar2k.com. The cost for the Adapter is $35.
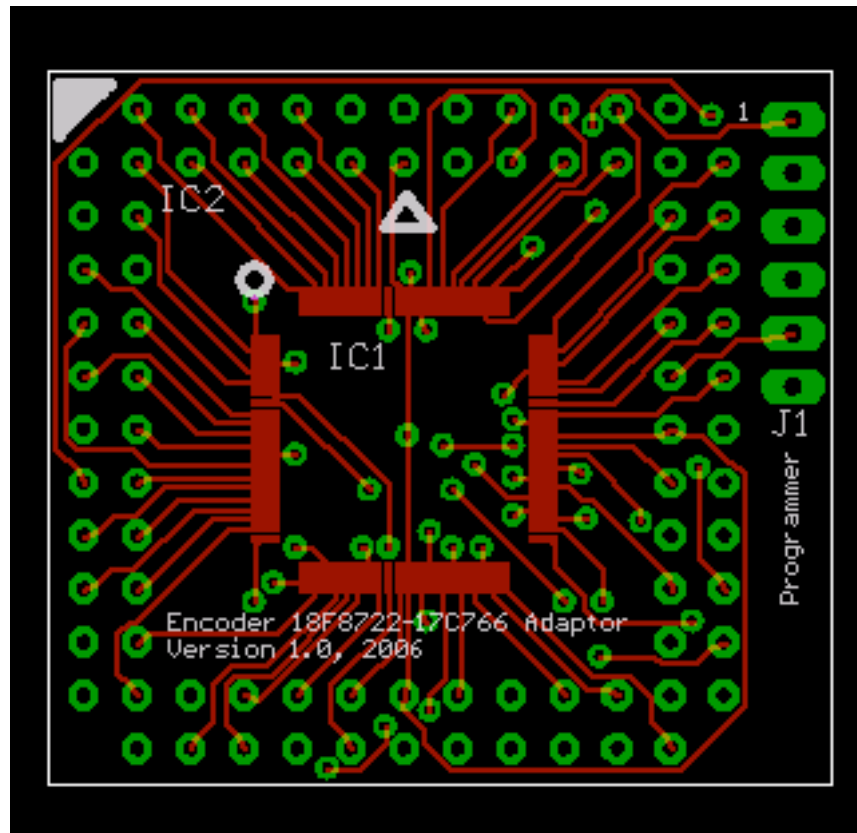2.) Pin-strips, Digikey ED2064-ND, $7.00 for a 64 pin pin-strip, you will need two of these. www.digikey.com
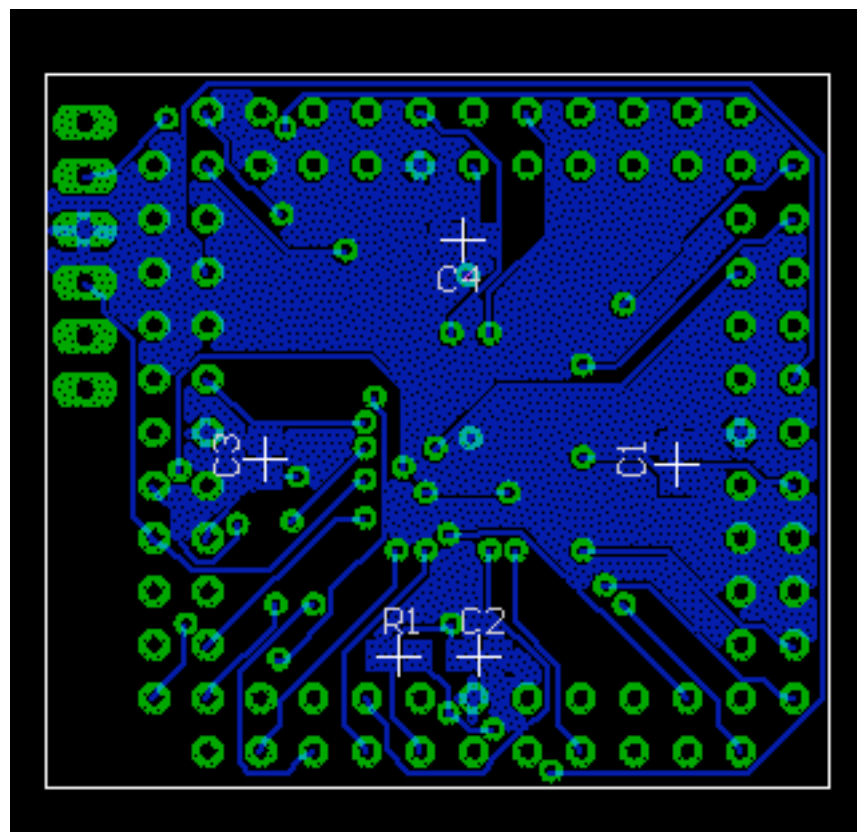
Figure 1, Adapter installed in rev 3.0 Encoder

Figure 2, Schematic of PIC 18F8722 Adapter

Figure 3, Adapter PC board top view

Figure 4, Adapter PC board top view

Adapter parts list:

Encoder Upgrade Adapter

Item	Quanity	ID	Part number	Description	Supplier	Cost each	Total cost	Notes
1	1	R1	260-4.7K	4.7K 0805 resistor	Mouser	0.08	0.08	
2	4	C1,C2,C3,C4	140-CC501B104K	0.1uF 0805	Mouser	0.14	0.56	
3	1	IC1	PIC18F8722-I/PT-ND	18F8722 PIC Microcontroller	Digikey	17.75	17.75	
4	1		adapter PCB	Upgrade adapter PCB	GAA	10	10	

Total   28.39