Converting Allen Organ Keying Matrices to MIDI

Purpose

Many Allen Organs of the era of the 1970s to the 1990s have a diode matrix keying system. This was a great approach in the reduction of cabling from the keyboards, but does not lend itself readily to converting the keying contacts to MIDI.

These same analog organs were extremely well built, and are thus suitable for the conversion to a more up-to-date, digitally sampled instrument. The assumption is, that the analog circuitry would be removed to make room for a MIDI Control System and a Sound Engine to produce the sampled voices.

The following discussion will show how this can be accomplished by the addition of a circuit board that will convert the Diode Matrix directly to MIDI Note ON/OFF values.

The Hardware

Refer to the full page pictorial for the discussion that follows.

Each keyboard manual will have a circuit board that looks like this:

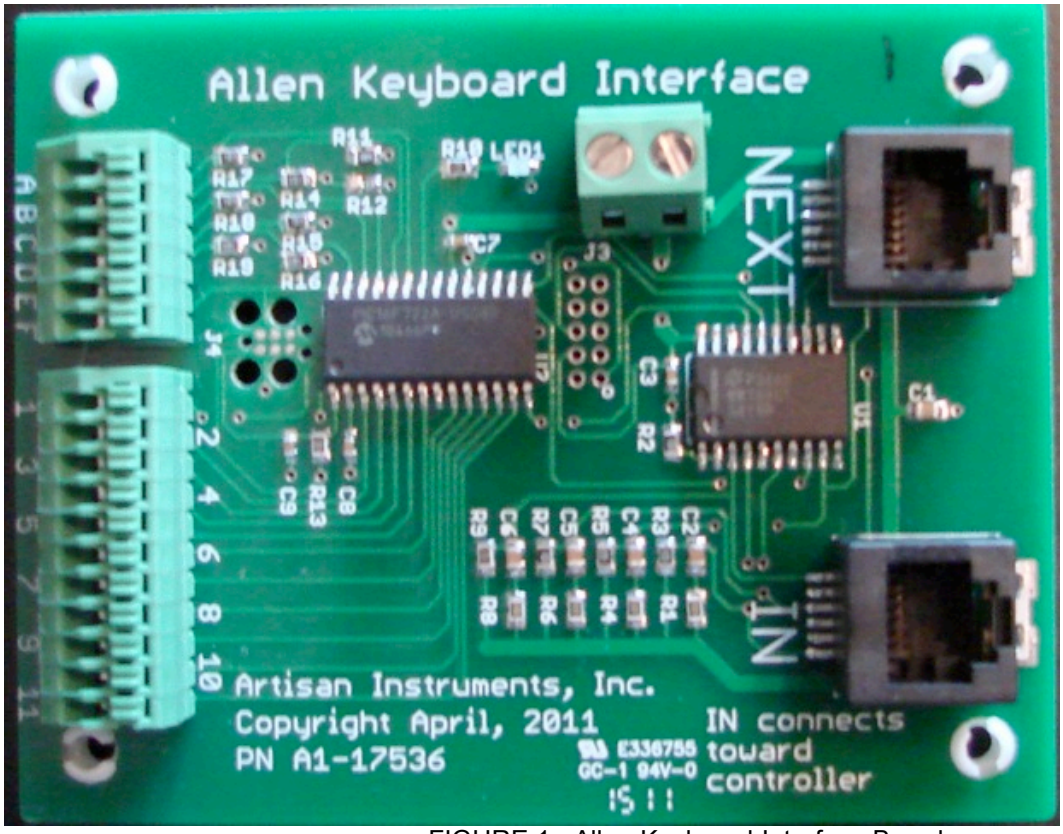


FIGURE 1 –Allen Keyboard Interface Board

The keyboard is depicted as a 6 by 11 matrix, meaning that there are 11 groups of 6 consecutive notes that are combined in such a way so that the 61 individual keys can be reduced to a 17-wire cable.

Of course, the matrix covers a bit more than the 61 keys of a keyboard, since it actually could accommodate 66 inputs. This is why you see that the Top C is a lonely single wire in the 11th group.

On the left side are the two connectors that accept the existing cable from the keyboard. The smaller, 6-position connector, accepts the wires labeled A, B, C, D, E, and F. These are the wires that connect to every 6th key of the keyboard.

The remaining 11 wires in the cable are identified as belonging to one of the groups, 1 through 11. These wires are then connected to the inputs of the larger, 11-wire connector in numerical order to complete the matrix information provided to the interface board.

The firmware circuitry on the interface board converts the matrix information to bit information, which now becomes a bit for each of the 61 keys. That bit information is then transmitted to a µMIDI Board where it is converted to Note ON/OFF MIDI Data.

The pictorial diagram (Figure 3) of the (4) Allen Keyboard Interface Boards and a µMIDI Board represent the complement of hardware necessary to convert a 3-Manual/Pedal Allen console to have MIDI that can now be used to drive any MIDI device.

Note the “daisy chain” interconnection of the Allen Keyboard Interface Boards. Any of the boards can be designated as the #1 board in the chain, and that board is connected to the µMIDI Board by a 6-wire phone cable connected to the RJ-11 connector labeled IN [Connects toward Controller, or µMIDI Board].

Then, the second Allen Keyboard Interface board is connected by a 6-wire phone cable plugged into the NEXT RJ-11 receptacle, and then to the IN of Board #2. Similarly, Board #2 is connected to Board #3. And finally, the Pedalboard is connected from #3 and becomes the end of the chain.

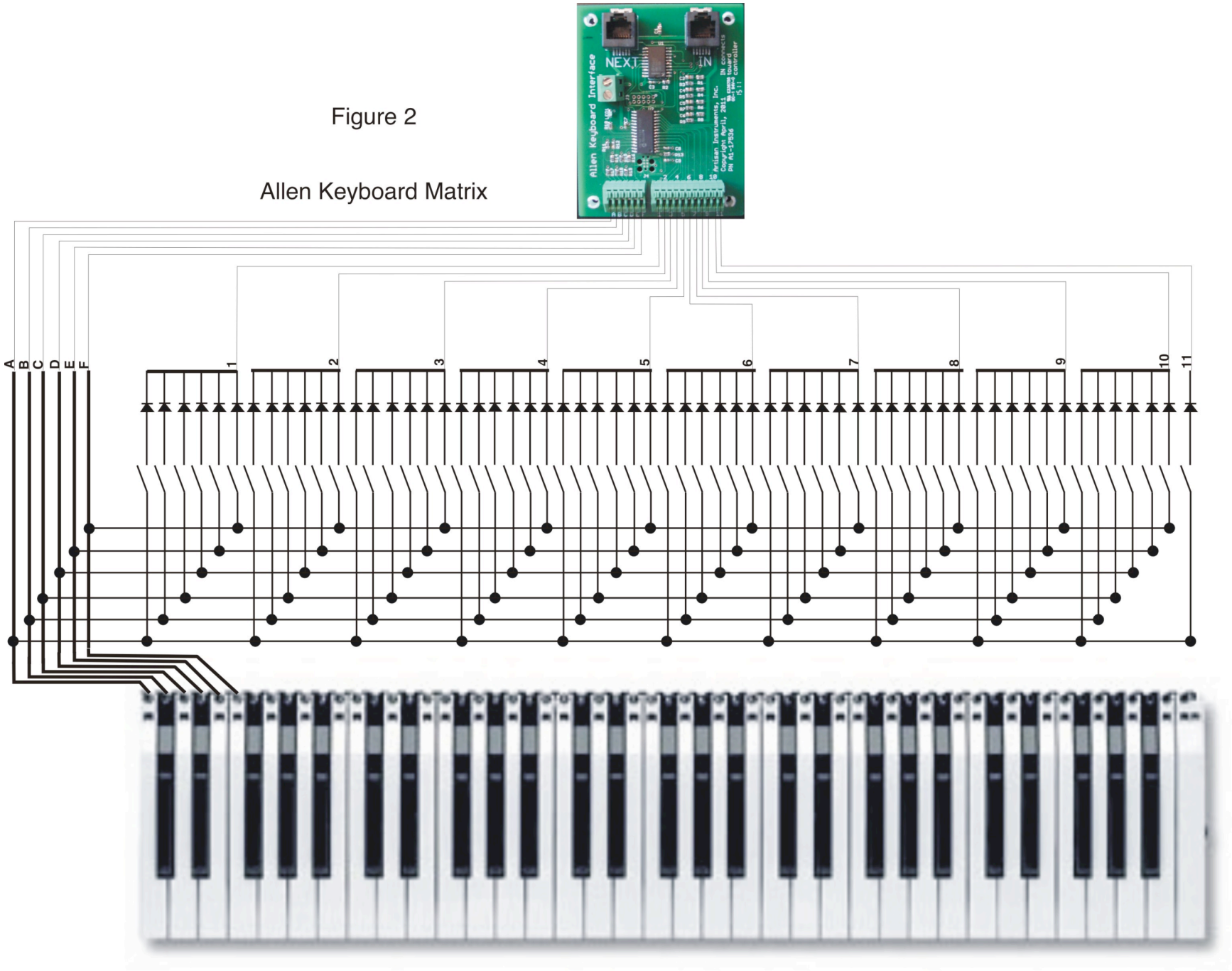
The µMIDI Board can be pre-programmed for this array of keyboards. However, it would assume that the interface boards are inter-connected from the Accompaniment to the Great to the Solo to the Pedal, with the Accompaniment connected to the µMIDI Board. The MIDI Channel number assignments would use the standard MIDI convention of: Great as Channel 1, Accompaniment as Channel 2, Solo as Channel 3, and the Pedal as Channel 4.

The price of this Allen keyboard Conversion Kit is:

For 2-Manual Organ	$550.00
For 3-Manual Organ	$650.00

Figure 2

Allen Keyboard Matrix



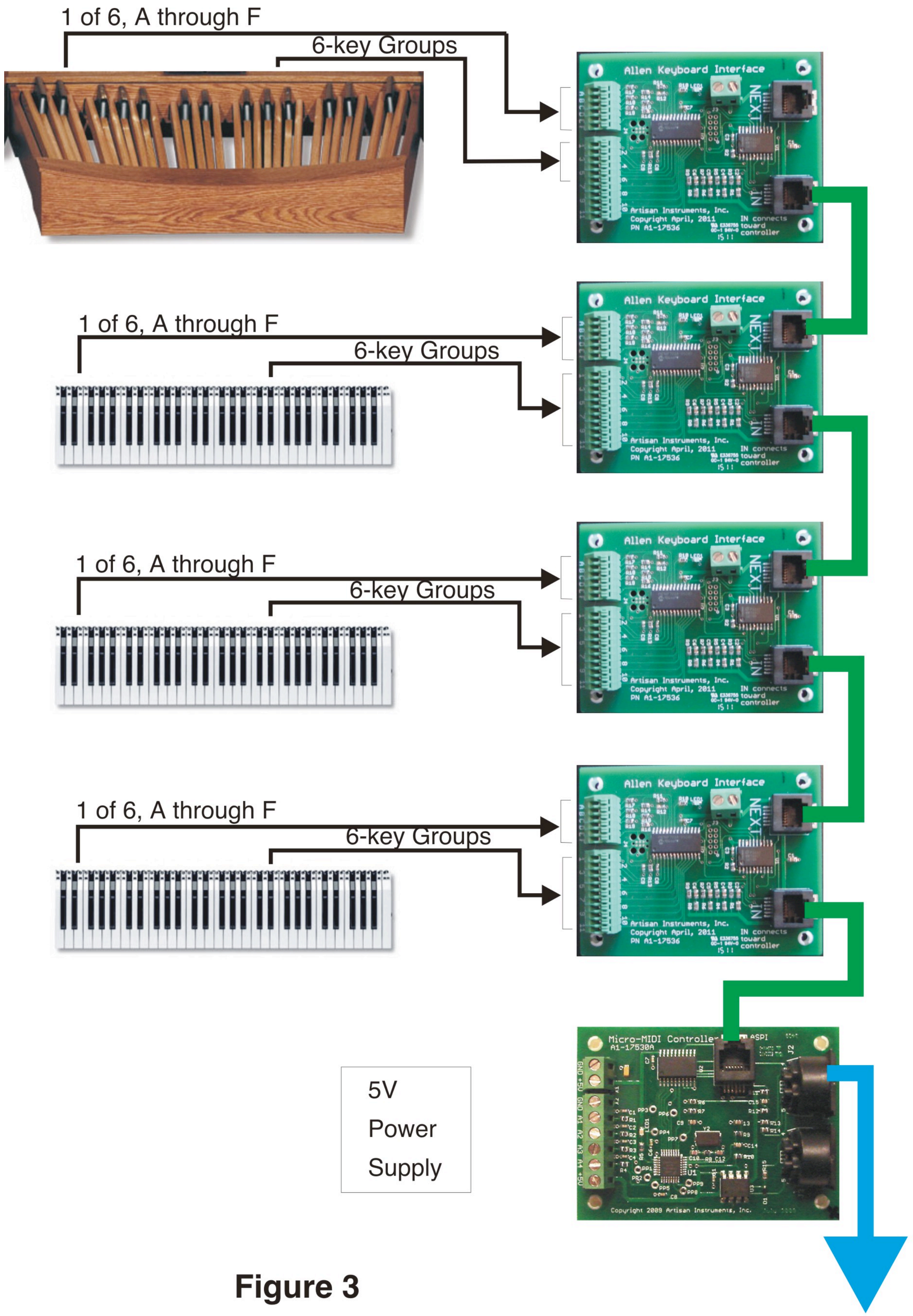


Figure 3

3-Manual MIDI Conversion Kit
For Allen Organs