Focal Plane Electronics Components Not Handled by I3

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Version FPE-7.0-RR8

1 Components to be added at Lincoln Laboratory

1.1 Clock oscillator

```
Interface.bom.txt:U88 OSC 2104D60M0000YAX DNP FP14 Surface Mount Oscillator
```

1.2 ID bits

Encode board serial number by populating selected R80-R84 with zero Ω resistors for each binary zero.

```
Interface.bom.txt:R84 RESISTOR DNP 1% 1/10W 0603 Resistor
Interface.bom.txt:R83 RESISTOR DNP 1% 1/10W 0603 Resistor
Interface.bom.txt:R82 RESISTOR DNP 1% 1/10W 0603 Resistor
Interface.bom.txt:R81 RESISTOR DNP 1% 1/10W 0603 Resistor
Interface.bom.txt:R80 RESISTOR DNP 1% 1/10W 0603 Resistor
```

1.3 Heater regulators with thermal expoxy

```
Video.bom.txt:Q5 LM195H DNP unknown TO39 unknown
Video.bom.txt:Q4 LM195H DNP unknown TO39 unknown
Video.bom.txt:Q1 LM195H DNP unknown TO39 unknown
```

2 Options we don't intend to implement

2.1 Isolating GND from chassis

R72 and R92 are "zero ohm" resistors connecting GND on the Interface board to mounting posts. These may be replaced with high resistance bleeders if DC isolation is desired. In that case, C72 and C92 may be populated with 4.7μF capacitors to provide an AC ground.

```
Interface.bom.txt:C92 CAPACITOR DNP 10WVDC X7R 1812 Ceramic capacitor
Interface.bom.txt:C72 CAPACITOR DNP 10WVDC X7R 1812 Ceramic capacitor
```

2.2 Populate R13 with zero Ω, remove R15 to allow serial clock high above 4.5V

```
Interface.bom.txt:X1/R13 RESISTOR DNP 1% 1/10W 0603 Resistor
Interface.bom.txt:X2/R13 RESISTOR DNP 1% 1/10W 0603 Resistor
Driver.bom.txt:X3/R13 RESISTOR DNP 1% 1/10W 0603 Resistor
Driver.bom.txt:X4/R13 RESISTOR DNP 1% 1/10W 0603 Resistor
```

2.3 Populate R14 with zero Ω, remove R16 to allow reset gate high above 4.5V

```
Interface.bom.txt:X1/R14 RESISTOR DNP 1% 1/10W 0603 Resistor
Interface.bom.txt:X2/R14 RESISTOR DNP 1% 1/10W 0603 Resistor
Driver.bom.txt:X3/R14 RESISTOR DNP 1% 1/10W 0603 Resistor
Driver.bom.txt:X4/R14 RESISTOR DNP 1% 1/10W 0603 Resistor
```

2.4 Option to hard wire parallel high to zero volts

To hard-wire the parallel clock high level to ground, in the parallel regulators remove R21, replace C5 with zero Ω, and populate R25 with zero Ω.

```
Interface.bom.txt:X1/X1/R25 RESISTOR DNP 1% 1/10W 0603 Resistor
Interface.bom.txt:X2/X1/R25 RESISTOR DNP 1% 1/10W 0603 Resistor
Driver.bom.txt:X3/X1/R25 RESISTOR DNP 1% 1/10W 0603 Resistor
Driver.bom.txt:X4/X1/R25 RESISTOR DNP 1% 1/10W 0603 Resistor
```

2.5 Light emitting diodes and associated limiting resistors, only for test boards

```
Interface.bom.txt:R51 RESISTOR DNP 1% 1/10W 0603 Resistor
Interface.bom.txt:LED6 LED DNP unknown 0603 LED
Interface.bom.txt:R50 RESISTOR DNP 1% 1/10W 0603 Resistor
Interface.bom.txt:LED5 LED DNP unknown 0603 LED
Interface.bom.txt:R49 RESISTOR DNP 1% 1/10W 0603 Resistor
Interface.bom.txt:LED4 LED DNP unknown 0603 LED
Interface.bom.txt:R48 RESISTOR DNP 1% 1/10W 0603 Resistor
Interface.bom.txt:LED3 LED DNP unknown 0603 LED
Interface.bom.txt:R47 RESISTOR DNP 1% 1/10W 0603 Resistor
Interface.bom.txt:LED2 LED DNP unknown 0603 LED
Interface.bom.txt:R46 RESISTOR DNP 1% 1/10W 0603 Resistor
Interface.bom.txt:LED1 LED DNP unknown 0603 LED
```

2.6 Alternate clock oscillator/bypass capacitor pairs

```
Interface.bom.txt:U8 OSC KC3225A60.0000C3GE00 DNP KYOCERA-KC3225A-CSurface Mount Oscillator
Interface.bom.txt:C8 CAPACITOR 0.1uF DNP 16WVDC X7R 0603 Ceramic capacitor

Interface.bom.txt:U80 1116R60M00000BF DNP unknown Vectron-1116 Surface Mount Oscillator
Interface.bom.txt:C80 CAPACITOR 0.1uF DNP 16WVDC X7R 0603 Ceramic capacitor
```

2.7 Capacitors for suppressing ringing on DAC serial lines, if necessary

```
Interface.bom.txt:C103 CAPACITOR DNP 25WVDC NP0 0603 Ceramic capacitor
Interface.bom.txt:C102 CAPACITOR DNP 25WVDC NP0 0603 Ceramic capacitor
```

2.8 Test headers

```
Interface.bom.txt:J8 Header DNP unknown HEADER16 unknown
Interface.bom.txt:J9 HEADER14 DNP unknown HEADER14SMT2MM unknown
```

2.9 Populate C9 to boost -50V to -75V

```
Video.bom.txt:PP/C9 CAPACITOR DNP 50WVDC X7R 0603 Ceramic capacitor
```

2.10   Backside bias for frontside (not flight) CCD chips

For a focal plane with frontside illuminated chips and common backside connections, populate R54 with zero ohms only for the channel you want to have control the backside bias. For a backside illuminated chip, do not populate.

```
Video.bom.txt:X1/R54 RESISTOR DNP 1% 1/10W 0603 Resistor
Video.bom.txt:X2/R54 RESISTOR DNP 1% 1/10W 0603 Resistor
Video.bom.txt:X3/R54 RESISTOR DNP 1% 1/10W 0603 Resistor
Video.bom.txt:X4/R54 RESISTOR DNP 1% 1/10W 0603 Resistor
```

2.11   Front end gain adjustment

To increase the front end gain on a CCD measurement chain, replace R8 (suitable value 3kΩ), populate C18 (2pF), and populate R7 with a value chosen for the desired gain.

```
Video.bom.txt:X4/X4/R7 RESISTOR DNP 1% 1/10W 0603 Resistor
Video.bom.txt:X4/X4/C18 CAPACITOR DNP 25WVDC X7R 0603 Ceramic capacitor
Video.bom.txt:X4/X3/R7 RESISTOR DNP 1% 1/10W 0603 Resistor
Video.bom.txt:X4/X3/C18 CAPACITOR DNP 25WVDC X7R 0603 Ceramic capacitor
Video.bom.txt:X4/X2/R7 RESISTOR DNP 1% 1/10W 0603 Resistor
Video.bom.txt:X4/X2/C18 CAPACITOR DNP 25WVDC X7R 0603 Ceramic capacitor
Video.bom.txt:X4/X1/R7 RESISTOR DNP 1% 1/10W 0603 Resistor
Video.bom.txt:X4/X1/C18 CAPACITOR DNP 25WVDC X7R 0603 Ceramic capacitor
Video.bom.txt:X3/X4/R7 RESISTOR DNP 1% 1/10W 0603 Resistor
Video.bom.txt:X3/X4/C18 CAPACITOR DNP 25WVDC X7R 0603 Ceramic capacitor
Video.bom.txt:X3/X3/R7 RESISTOR DNP 1% 1/10W 0603 Resistor
Video.bom.txt:X3/X3/C18 CAPACITOR DNP 25WVDC X7R 0603 Ceramic capacitor
Video.bom.txt:X3/X2/R7 RESISTOR DNP 1% 1/10W 0603 Resistor
Video.bom.txt:X3/X2/C18 CAPACITOR DNP 25WVDC X7R 0603 Ceramic capacitor
Video.bom.txt:X3/X1/R7 RESISTOR DNP 1% 1/10W 0603 Resistor
Video.bom.txt:X3/X1/C18 CAPACITOR DNP 25WVDC X7R 0603 Ceramic capacitor
Video.bom.txt:X2/X4/R7 RESISTOR DNP 1% 1/10W 0603 Resistor
Video.bom.txt:X2/X4/C18 CAPACITOR DNP 25WVDC X7R 0603 Ceramic capacitor
Video.bom.txt:X2/X3/R7 RESISTOR DNP 1% 1/10W 0603 Resistor
Video.bom.txt:X2/X3/C18 CAPACITOR DNP 25WVDC X7R 0603 Ceramic capacitor
Video.bom.txt:X2/X2/R7 RESISTOR DNP 1% 1/10W 0603 Resistor
Video.bom.txt:X2/X2/C18 CAPACITOR DNP 25WVDC X7R 0603 Ceramic capacitor
Video.bom.txt:X2/X1/R7 RESISTOR DNP 1% 1/10W 0603 Resistor
Video.bom.txt:X2/X1/C18 CAPACITOR DNP 25WVDC X7R 0603 Ceramic capacitor
Video.bom.txt:X1/X4/R7 RESISTOR DNP 1% 1/10W 0603 Resistor
Video.bom.txt:X1/X4/C18 CAPACITOR DNP 25WVDC X7R 0603 Ceramic capacitor
Video.bom.txt:X1/X3/R7 RESISTOR DNP 1% 1/10W 0603 Resistor
Video.bom.txt:X1/X3/C18 CAPACITOR DNP 25WVDC X7R 0603 Ceramic capacitor
```

```
Video.bom.txt:X1/X2/R7 RESISTOR DNP 1% 1/10W 0603 Resistor
Video.bom.txt:X1/X2/C18 CAPACITOR DNP 25WVDC X7R 0603 Ceramic capacitor
Video.bom.txt:X1/X1/R7 RESISTOR DNP 1% 1/10W 0603 Resistor
Video.bom.txt:X1/X1/C18 CAPACITOR DNP 25WVDC X7R 0603 Ceramic capacitor
```

3 Not an actual component, footprint only

```
Interface.bom.txt:GP1 CHASSIS DNP unknown CHASSIS Chassis ground
Interface.bom.txt:GP2 CHASSIS DNP unknown CHASSIS Chassis ground
```