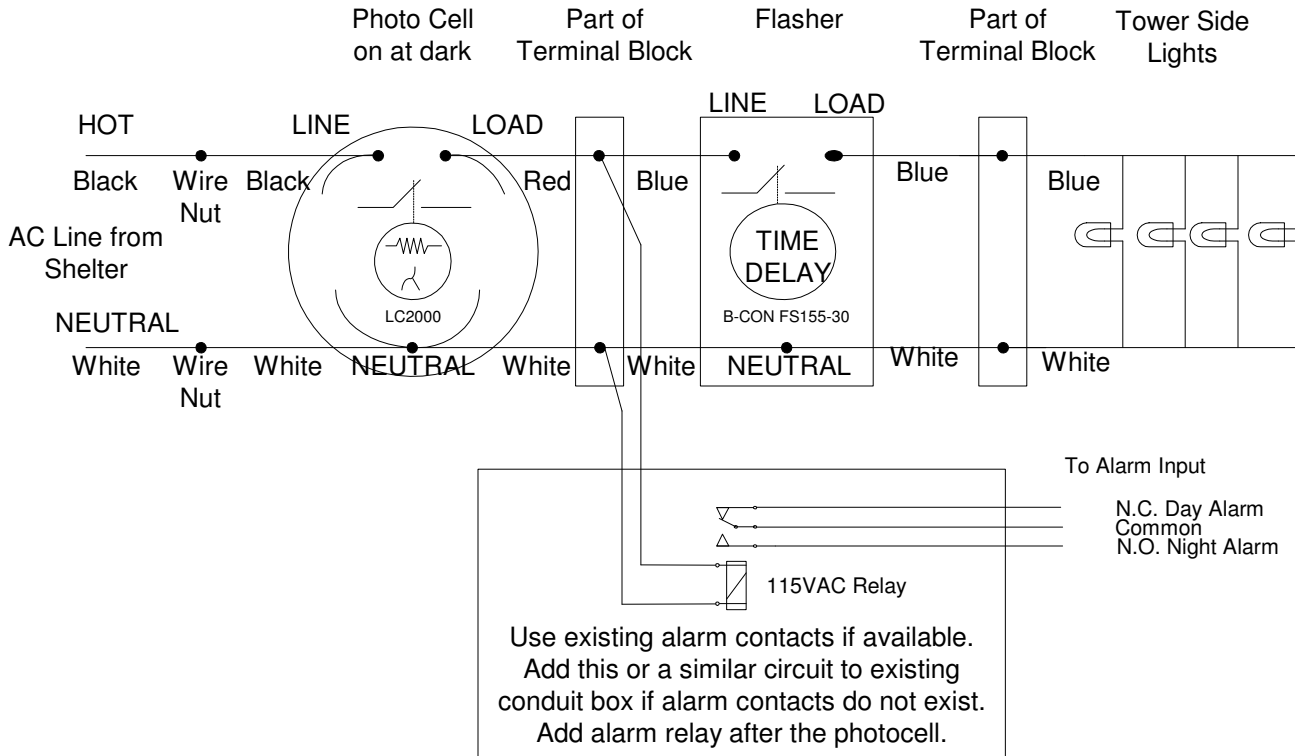


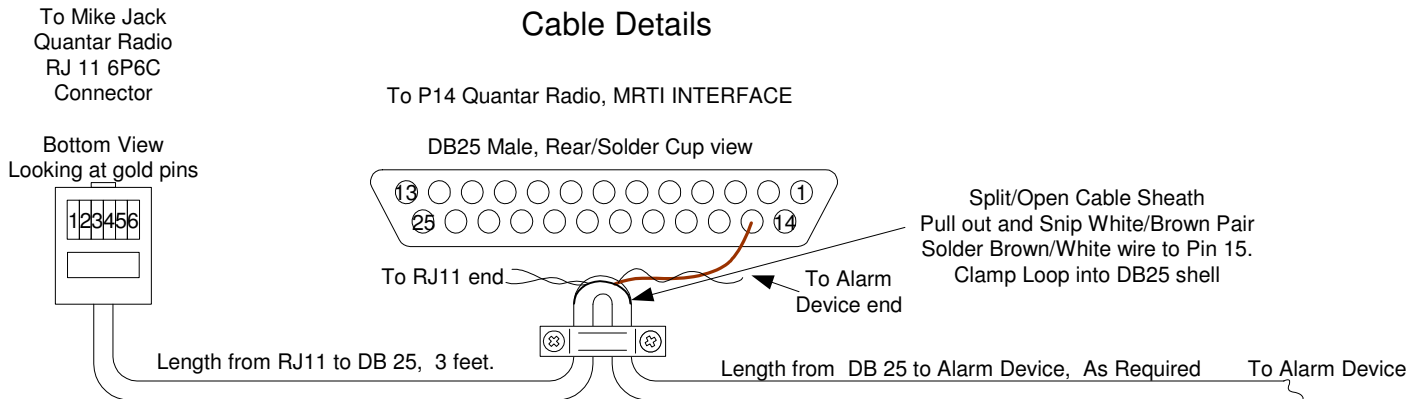
| Date: | Revision/Addition/ Note | By : |
|---------------|--|------|
| June 04, 2008 | Original concept and design. This project continues from original Tower voice alarm project. Austin wanted more input/outputs. Had to use to a larger processor. Because of lessons learned on the original project and interfacing to a Quantar Radio, reusing the same base circuits for Carrier Detect and PTT. | GSC |
| June 12, 2008 | Software ALM2TN1. 2383 words of 8192 words | GSC |
| June 16, 2008 | Added DTMF harmonic filter to smooth tone output. | GSC |
| June 21, 2008 | Software ALM2TN8. 1000 words of 8192 words. | |

| | | | |
|---|-------------------------------|--|---------------|
| Drawn By: Gerald Crenshaw WD4BIS | Date: June 16, 2008 | From the bench of: Amateur Radio Station WD4BIS | Page 1 |
| Engineer: Gerald Crenshaw WD4BIS | Date: June 16, 2008 | | of 1 |
| Checked By: Janet Crenshaw WB9ZPH | Date: June 16, 2008 | Title: ALARM TO DTMF TONE MODULE 8 ALARM INPUTS | |

TYPICAL EXAMPLE OF TOWER LIGHT WIRING



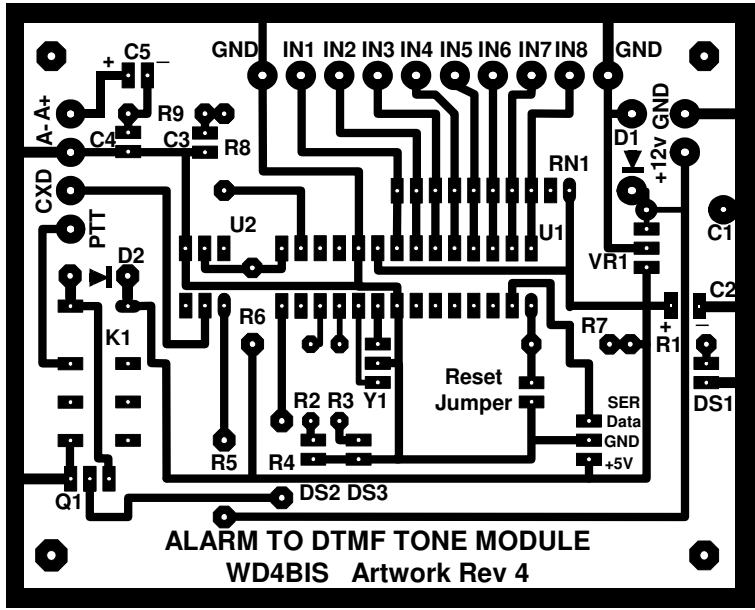
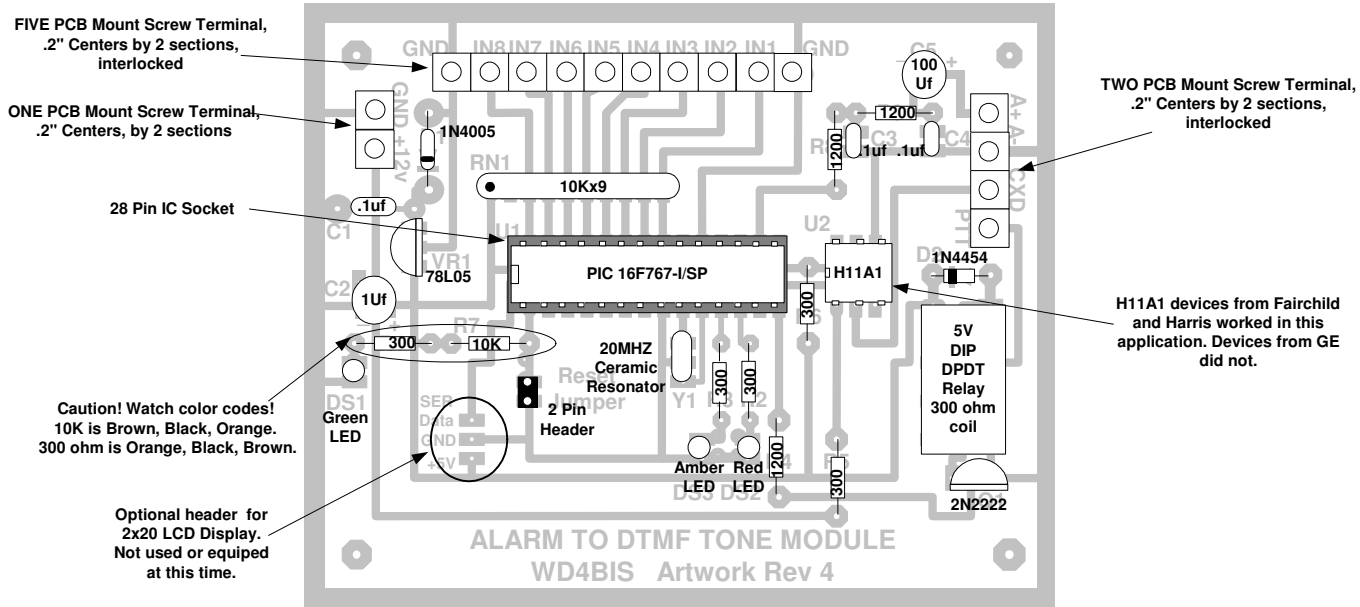
Quantar Radio to Alarm Device. Cable Details



| | | |
|---|---|---|
| Cable made with Cat 3 or Cat 5, 4 Pair cable. Snip off White Brown pair at RJ11 connector and crimp remaining wires into RJ11 as follows. | 1 White/Blue 2 Blue/White 3 White /Orange 4 Orange/White 5 White/Green 6 Green/White | Pin 1 Pin 2 Pin 3 PTT Pin 4 Audio + Pin 5 Pin6 Audio - |
|---|---|---|

| Date | Revision/Addition/ Note | by |
|---------------|--|-----|
| Nov. 10, 2007 | Original Concept and design. | GSC |
| Nov. 23, 2007 | Added Quantar Radio to Alarm Device cable detail. | GSC |
| May 23, 2008 | Changed length of cable from 6P6C RJ11 to DB25 from 2' to 3'. The 2' cable length only allows cable routing under Quantar radio not over the top as may be required in some installations. | GSC |

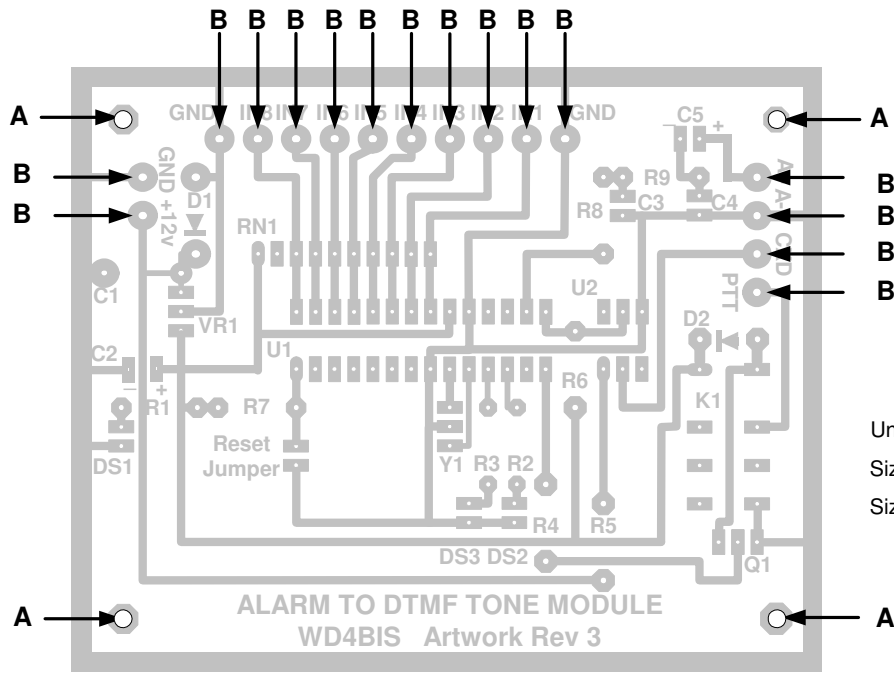
| | | | |
|--|-------------------------------------|--|---|
| Drawn By: Gerald Crenshaw WD4BIS | Date: May 23, 2008 | From the bench of: Amateur Radio Station WD4BIS | Page 2 of 2 |
| Engineer: Gerald Crenshaw WD4BIS | Date: May 23, 2008 | | Title: ALARM TO DTMF TONE MODULE QUANTAR TO MODULE CABLE Rev. 3 |
| Checked By: Janet Crenshaw WB9ZPH | Date: May 23, 2008 | | |



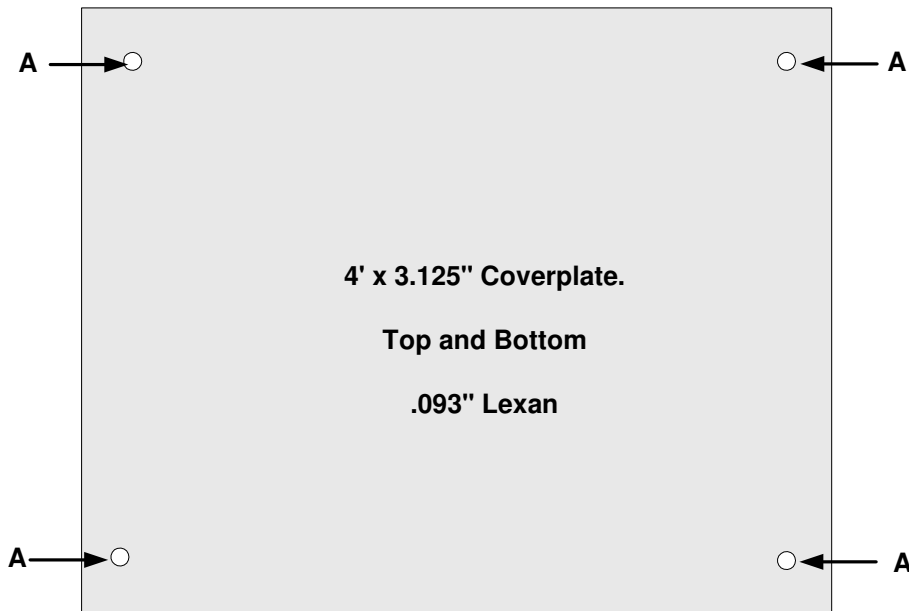
| Date: | Revision/Addition/ Note | By : |
|---------------|--|------|
| June 11, 2008 | Original PWB design and artwork. | GSC |
| June 11, 2008 | Did step and repeat artwork and transferring to copper. Software ALM2TN1. | GSC |
| June 12 2008 | Rev 2. Moved components away from PCB Mount terminals that had intruded on footprint. Turned relay 90 Degrees and reduced outline of board. | |
| June 16 2008 | Rev 3. Moved components away from corners. Changed line weight of all traces from 9 to 13 point. My etching process is undercutting 9 point lines. | |
| June 21 2008 | Rev 4. Added Traces/Header for a Serial LCD Display as an option for later. Dont know if will use at this point but had the space. LCD Display costs about \$25 at this point. Have lots of memory available to add text messages on status of alarms. | |

| | |
|---|-------------------------------|
| Drawn By: Gerald Crenshaw WD4BIS | Date: June 16, 2008 |
| Engineer: Gerald Crenshaw WD4BIS | Date: June 16 2008 |
| Checked By: Janet Crenshaw WB9ZPH | Date: June 16, 2008 |

| | |
|--|----------------|
| From the bench of: Amateur Radio Station WD4BIS | Page 1 of 1 |
| Title: PWB/ Component Placement ALARM TO DTMF TONE MODULE | |



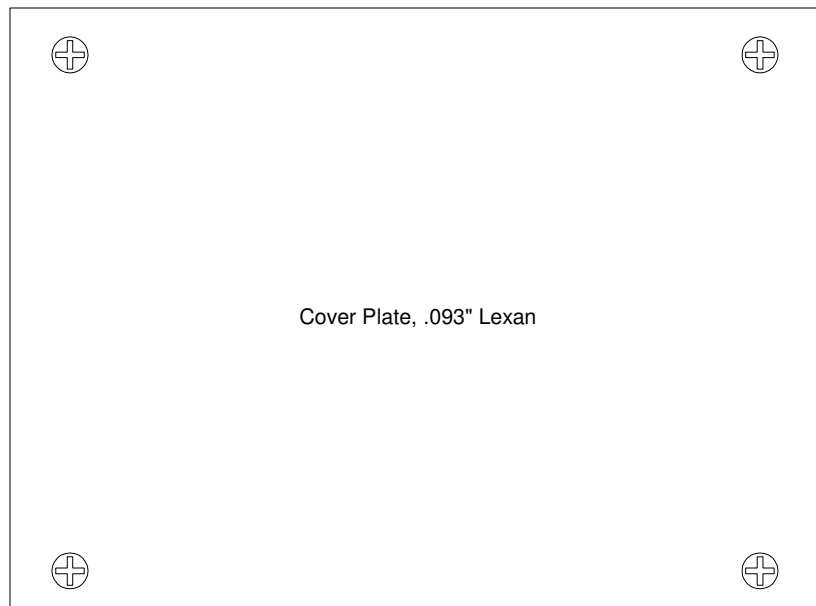
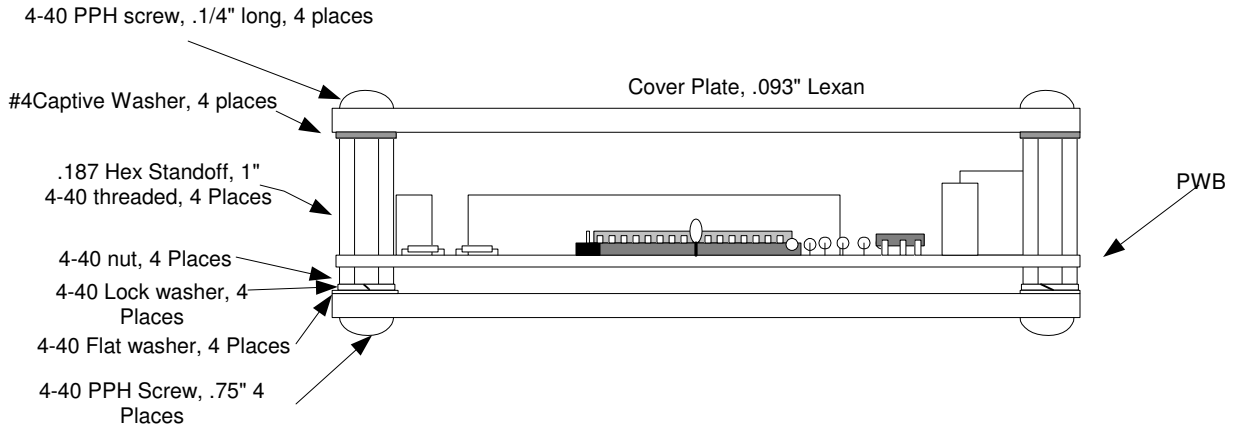
Unmarked Holes Drill #60 .040"
 Size A Holes Drill #28 .140"
 Size B Holes Drill #55 .052" (3/64" drill will work)



| Date: | Revision/Addition/ Note | By : |
|--------------|-------------------------|------------|
| June 16 2008 | Original schedule. | GSC GSC |

| | | | |
|---|-------------------------------|--|---|
| Drawn By: Gerald Crenshaw WD4BIS | Date: June 16, 2008 | From the bench of: Amateur Radio Station WD4BIS | Page 1 of 1 |
| Engineer: Gerald Crenshaw WD4BIS | Date: June 16 2008 | | Title: Drill Schedule ALARM TO DTMF TONE MODULE |
| Checked By: Janet Crenshaw WB9ZPH | Date: June 16, 2008 | | |

Side View



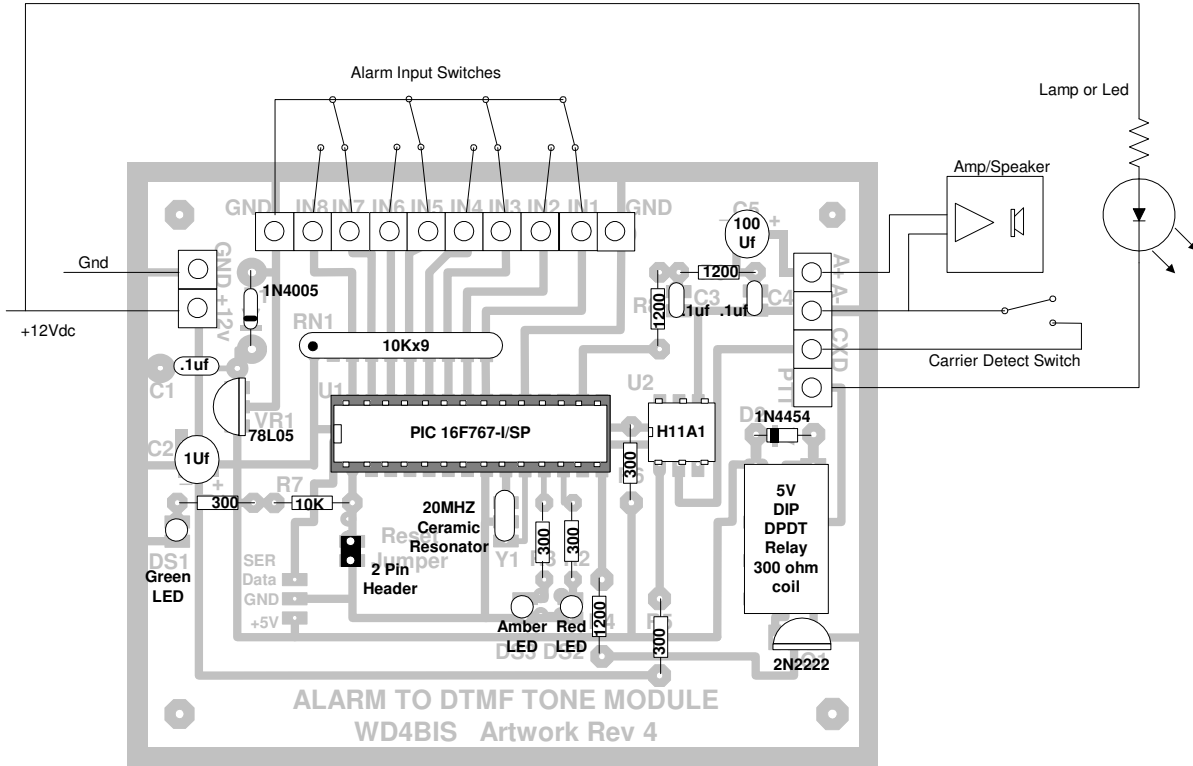
| Date: | Revision/Addition/ Note | By: |
|---------------|------------------------------|-----|
| June 18, 2008 | Original drawing and detail. | GSC |

| | | | |
|---|-------------------------------|---|---|
| Drawn By: Gerald Crenshaw WD4BIS | Date: June 18, 2008 | From the bench of: Amateur Radio Station WD4BIS | Page 1 of 1 |
| Engineer: Gerald Crenshaw WD4BIS | Date: June 18, 2008 | | Title: Alarm to DTMF Tone Module Mechanical Assembly |
| Checked By: Janet Crenshaw WB9ZPH | Date: June 18, 2008 | | |

| Parts List | | | |
|--------------------|--|--|--------------------|
| Designation | Description | Vendor & Part# | Qty |
| C1,C3,C4 | Capacitor .1uf 50V | Any | 3 |
| C2 | Capacitor 1uf 35V | Any | 1 |
| C5 | Capacitor 100uf 35V | Any | 1 |
| D1 | Diode IN4454 | Any | 1 |
| D2 | Diode IN4001 | Any | 1 |
| DS1 | LED Green | Any | 1 |
| DS2 | LED Red | Any | 1 |
| DS3 | LED Amber | Any | 1 |
| K1 | DIP Relay, 5V, DPDT,G5V-2 or equiv | Jameco 13997, Mouser 817-FTR-F1CA005V | 1 |
| Q1 | Transistor 2N2222 | Jameco 38236, P2N2222AGOS-ND | 1 |
| R1,2,3,5,6 | Resistor 1/4W 5% 300 ohm | Any | 5 |
| R4,R8,R9 | Resistor 1/4W 5% 1200 ohm | Any | 3 |
| R7 | Resistor 1/4W 5% 10k ohm | Any | 1 |
| RN1 | Resistor Network, SIP 10K 5% by 9 Sections | Jameco 780497, Mouser 266-10K-RC | 1 |
| U1 | Microchip PIC16F767 | Jameco 312709 Digikey PIC16F767-I/P-ND | 1 |
| U2 | Optoisolator H11A1 | Jameco 277561,Digikey 751-1273-5-ND | 1 |
| VR1 | Voltage Regulator, TO-92, 5V,100ma 78L05 | Jameco 51182, Digikey 296-1365-ND | 1 |
| Y1 | 20Mhz Ceramic Resonator/w caps | Jameco 324671 Digikey XT909-ND | 1 |
| T1-T16 | Terminal, 2 sections .2" Centers PWB | Jameco 189676, Digikey ED1601-ND | 8 |
| Other/Misc. | | | |
| Socket | 24Pin DIP | Any | 1 |
| .1" 2Pin Header | Snap Apart header | Any | 2pin |
| Standoff | .187" (3/16") Hex, .1.0" long, 4-40 thread | Jameco 139185,Digikey 1895K-ND | 4 |
| Power Supply | 12V 500Ma | Any | 1 |
| Screw | 4-40 PPH x.25" | Any | 4 |
| Screw | 4-40 PPH x .75" | Any | 4 |
| Washer | #4 | Any | 4 |
| Lock washer | #4 | Any | 4 |
| PWB | Alarm to DTMF Tone PWB | WD4BIS | 1 |
| Cover Plate | 3"x4" Cover Plate, .093"Lexan | Home Depot for raw material | 2 |
| Solder | 60/40 rosin core | Any | As required |
| Interconnect Cable | | | |
| 25 pin Connector | DB25 Male Solder cup | Any | 1 |
| 25 Pin Shell | DB 25 Connector Shell | Any | 1 |
| 6 pin | Modular connector, RJ11 (AKA RJ12), 6P6C | Any | 1 |
| 4 Pair | 4 pair Cat 3 or Cat 5 cable | Any | Length as required |

| Date: | Revision/Addition/ Note | By: |
|--------------|-------------------------|-----|
| June17, 2008 | Original Parts List. | GSC |

| | | | |
|---|-------------------------------|---|--------|
| Drawn By: Gerald Crenshaw WD4BIS | Date: June 17, 2008 | From the bench of: Amateur Radio Station WD4BIS | Page 1 |
| Engineer: Gerald Crenshaw WD4BIS | Date: June 17, 2008 | | of 1 |
| Checked By: Janet Crenshaw WB9ZPH | Date: June 17, 2008 | Title: Alarm to DTMF Tone Module Parts List | |



| Date: | Revision/Addition/ Note | By: |
|---------------|------------------------------|-----|
| June 21, 2008 | Original drawing and detail. | GSC |

| | |
|---|-------------------------------|
| Drawn By: Gerald Crenshaw WD4BIS | Date: June 21, 2008 |
| Engineer: Gerald Crenshaw WD4BIS | Date: June 21, 2008 |
| Checked By: Janet Crenshaw WB9ZPH | Date: June 21, 2008 |

| | |
|--|----------------|
| From the bench of: Amateur Radio Station WD4BIS | Page 1 of 1 |
| Title: Alarm to DTMF Tone Module Bench Test Set Up | |

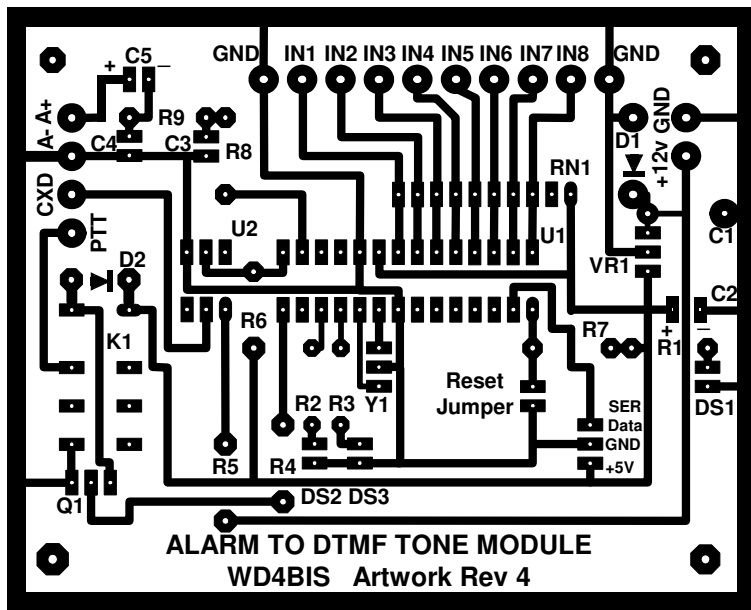
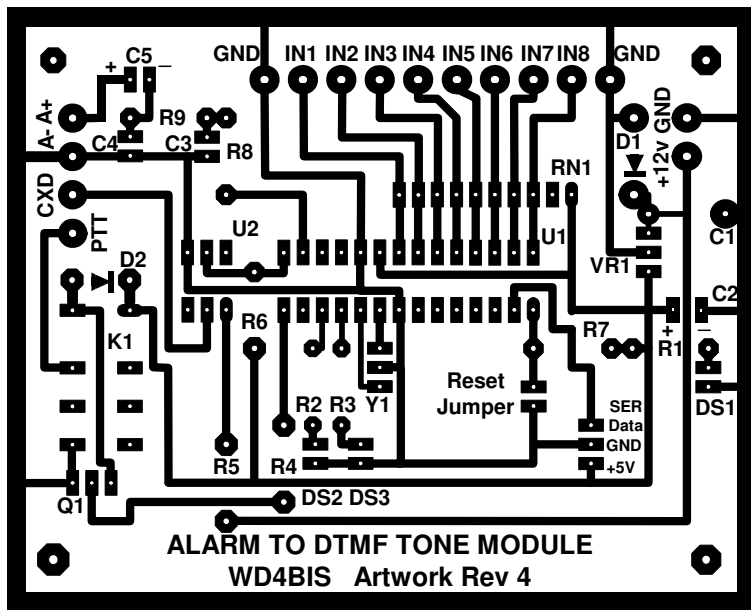
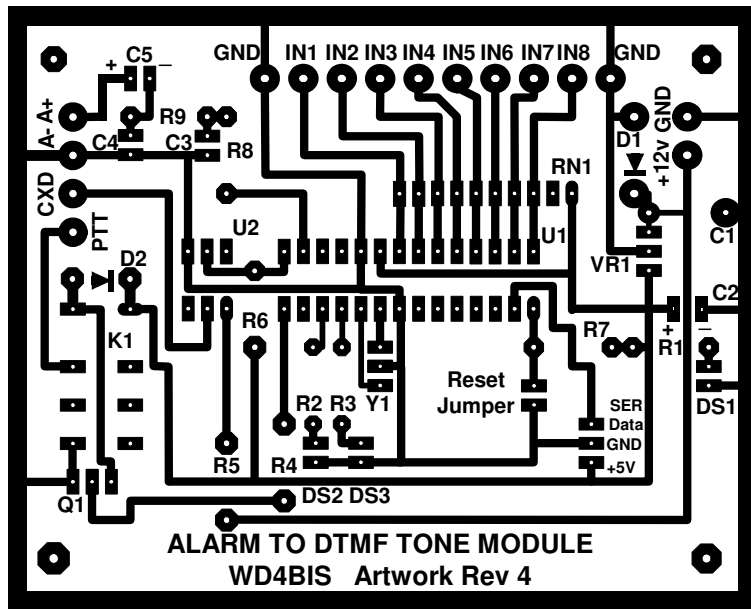
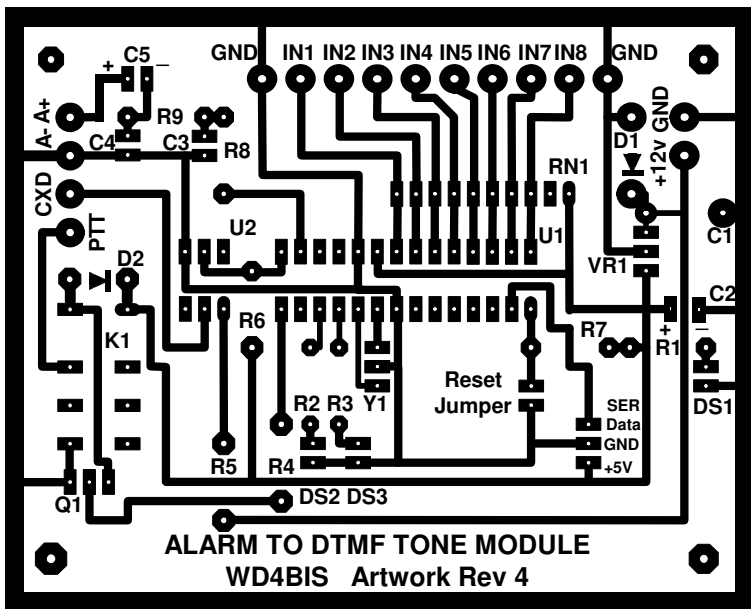
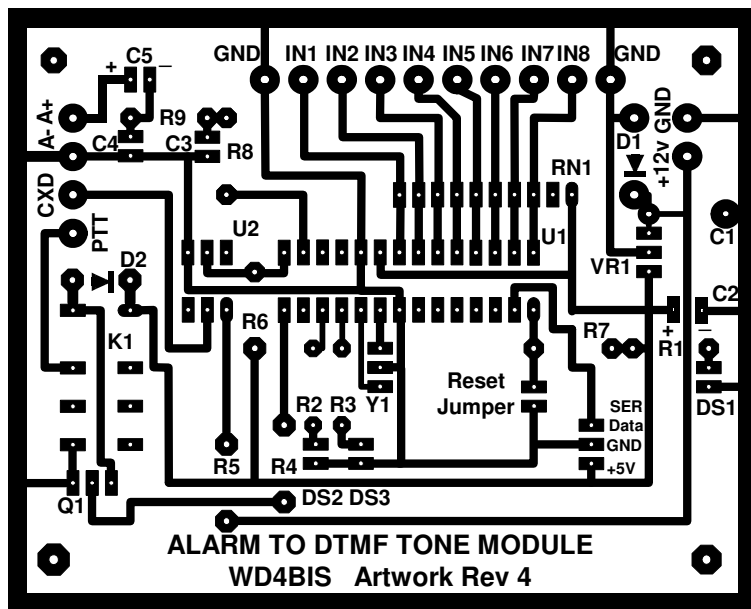
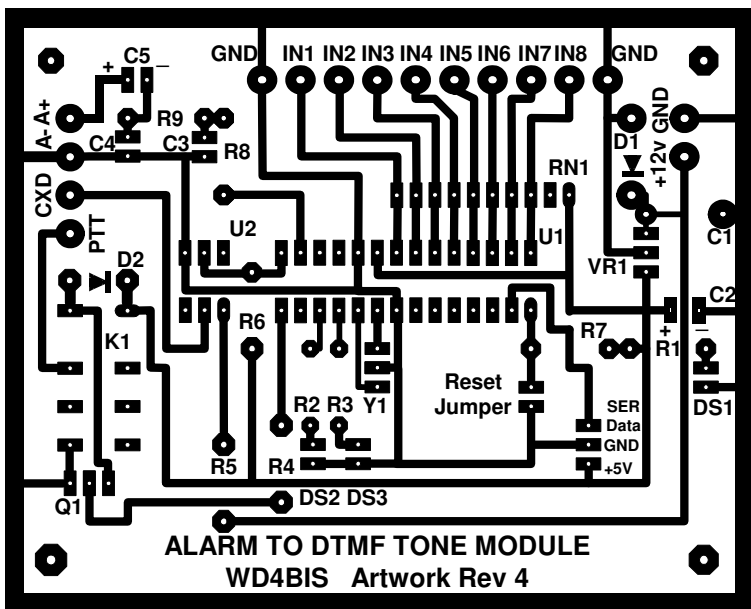


Photo Positive artwork, Step and Repeat.

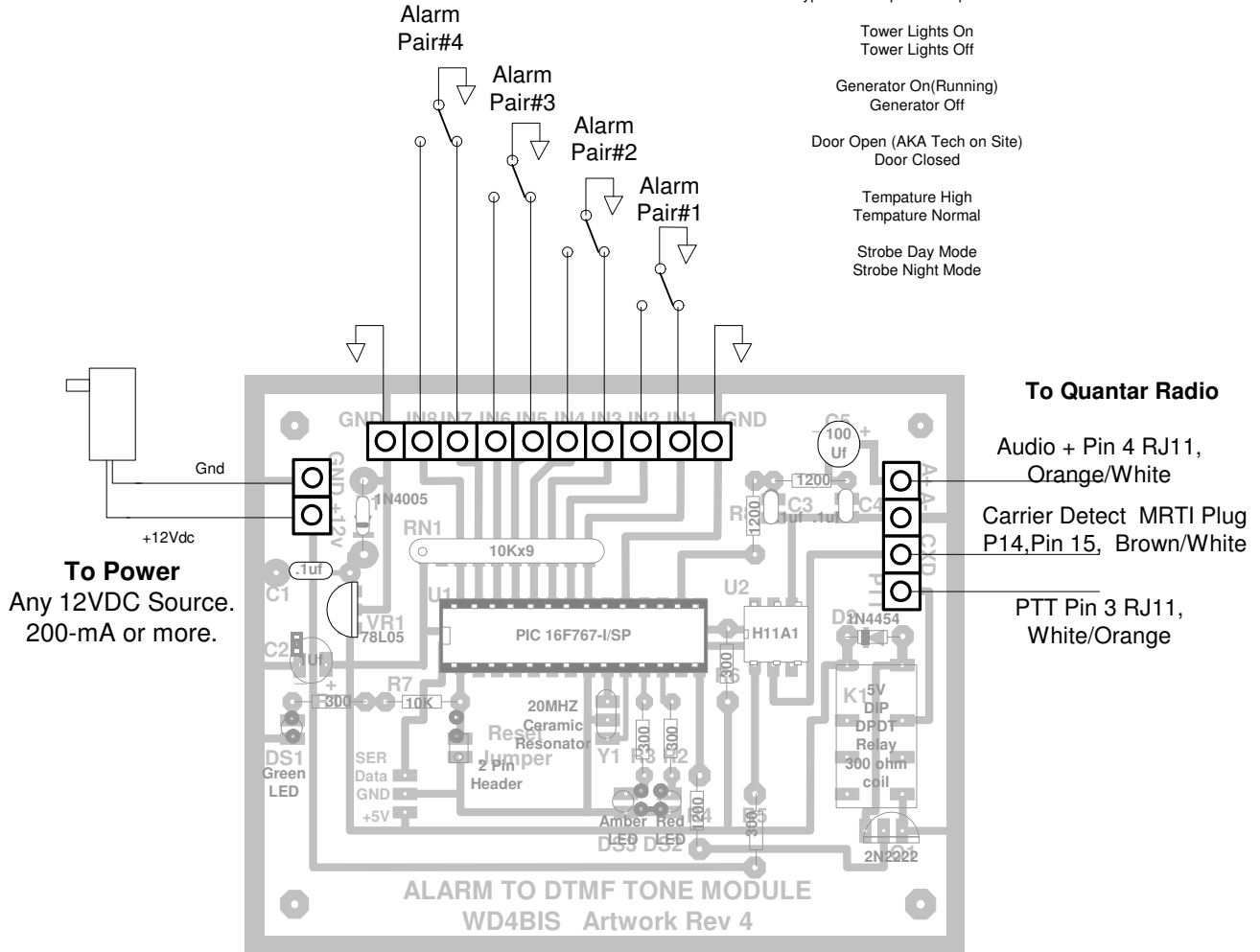


HP4/4M Laser Printer: File, Print, Properties, Layout, Advance, Postscript Options, Mirror Image, Yes
Print this page Mirror image only on Laser Printer. Print on Staples Photo Basic Gloss, SKU (item#) 471865

**To Station Alarms. Alarm contacts isolated Form C
(Common, Normally Open, Normally Closed) Dry contacts.**

Typical alarm pair Examples include

- Tower Lights On
Tower Lights Off
- Generator On(Running)
Generator Off
- Door Open (AKA Tech on Site)
Door Closed
- Temperature High
Temperature Normal
- Strobe Day Mode
Strobe Night Mode



To Quantar Radio

- Audio + Pin 4 RJ11,
Orange/White
- Carrier Detect MRTI Plug
P14, Pin 15, Brown/White
- PTT Pin 3 RJ11,
White/Orange

| Date: | Revision/Addition/ Note | By: |
|------------------------|------------------------------|---------------|
| June 21, 2008 | Original drawing and detail. | GSC |
| Drawn By: | | Date: |
| Gerald Crenshaw WD4BIS | | June 21, 2008 |
| Engineer: | | Date: |
| Gerald Crenshaw WD4BIS | | June 21, 2008 |
| Checked By: | | Date: |
| Janet Crenshaw WB9ZPH | | June 21, 2008 |

| | |
|--|--------|
| From the bench of: | Page 1 |
| Amateur Radio Station WD4BIS | of 1 |
| Title: Alarm to DTMF Tone Module Interconnection | |