UD-1B-DMH

Multi-Format Encoder/Decoder

Manual Revision: 2010-02-04

Covers Software Revisions:
UD-1: 4.0 & Higher

SPECIFICATIONS

Operating Voltage	+5.5-18 VDC
Operating Current	20 mA
Operating Temperature	-30 - +60 C
PTT Output Current	200 mA
Horn Output Current	200 mA
Disable Output	200 mA
Input Level	25-500 mV RMS
Input Impedance	100 KΩ
Audio Output Level	1V RMS
Audio Output Impedance	10KΩ/22 KΩ

GENERAL INFORMATION

The UD-1B Series offers ANI encoding, decode and transpond of tone formats such as DTMF, 5-tone, 2-tone, Pulse Tone, and Burst Tone. The UD-1B Series can be used with Midian's CAD-100/200 or DDU-100/200 for dispatching in fleets or it can be used for equipment or alarm activations.

PRODUCT PROGRAMMING

Midian's UD-1B-DMH is programmed using the KL-3 programmer. Please reference the KL-3 manual for setup instructions of the KL-3 software and hardware. From the product selection screen on the KL-3 UP software, select the appropriate product name from the list and click OK.

Set the parameters of the product to fit the application. If any clarifications on a feature are required, move the mouse cursor over the feature name until the question mark appears and right click, a definition of the feature will be shown.

After entering the parameters, save the file by going to File - Save As. Enter the file name in the File Name block and click Save. Saving the file will allow for quick and easy reprogramming of units.

Connect the Blue wire to the Green KL-3 lead and the Black wire to a common ground with the KL-3's Black lead. The Yellow clip lead is not used with these products, as the UED series is non-readable.

Make certain the Monitor button of the UD-1B-DMH is in the out position; ground the PTT Input, turn on power, and within 5 seconds click "Program Unit" in the menu bar to send the file to the UD-1B-DMH.

HARDWARE INSTALLATION

Be certain to follow standard anti-static procedures when handling any of Midian's products.

Black – Ground – Connect to the nearest ground point.

Red - +10-16 VDC – Connect to switched B+ in the radio.

Gray – COR/COS – Connect to point in the squelch or CTCSS circuit that changes logic level when carrier is received.

Orange – RX Tone Input – Connect to an audio point in the receiver, usually the high side of the volume control or discriminator output. When using CTCSS, pick up the audio after the high pass filter.

Light Brown – Monitor/Squelch Out – Connect to a point in the squelch circuit that normally changes logic level with carrier. The squelch polarity is set in the KL-3 software and by selecting the polarity of D-5 (JU-12). R-67 can be changed to provide more or less current as needed. Do not allow the Monitor/Squelch Output to conflict with the COR/COS lead input.

Green – Mic Mute – Connect to mic element bias point or to some other point in the audio amp to crowbar mic audio to ground during ANI to prevent voice interference. To access this feature, install JU4.

This lead can also be used for Disable – This feature is the Deadbeat Disable function of the UD-1. When activated Q5 latches low until commanded to unlatch. To access this feature, install JU5.

Purple/White (Internal) - Momentary Horn - This provides a 0-9 second ground during ringing through Q-8 (500 mA).

Yellow – TX Tone Out – Connect to the modulator circuit. Use high impedance point in the radio. If generating CTCSS, use the CTCSS point in the modulator.

Violet – Alert Tone/Speaker Audio – Connect to high side of the speaker. This provides Time-Out Timer, Penalty, and Go Ahead tones. When using 20-40 Ohm speakers, the onboard resistor in series with Q7 should be sufficient. When attaching this lead to a 4-8 Ohm speaker, add a 100-Ohm resistor in series with the lead to limit current.

White – PTT In – Requires a logic low from the radio's PTT switch. If TOT is not needed, the PTT In & Out wires can be tied together and connected directly across the radio's PTT switch. For non-common PTT, open the PTT path and connect the gray wire to the switch.

Dark Brown – PTT Out – Connect to the other side of the open PTT path as referred to in the above step. The UED now has control of the PTT for Time Out Timer (TOT) and penalty timer. The PTT transistor, Q6, is rated at 100 mA continuous.

Blue – Hook/Monitor/Program In – For Program In, this lead is connected to the Green lead from the KL-3 programmer. Connect to the mic hang-up button, monitor button, or squelch pot switch.

Pink – RX Hipass Output – In CTCSS applications, this filters CTCSS out of the RX audio path.

Customer Added Wire – Auxiliary/Emergency Input – When taken to Ground, this input can send Emergency or disable the transpond. This depends on the Auxiliary Input setting in the KL-3 under the Control tab. This is added to pin 2 of the RJ connection points.

HARDWARE ALIGNMENT

RX Audio Input: Adjust R-79 for maximum amplitude so that Pin 14 of U2 doesn't quite clip when a 1 KHz tone modulated at 3.3 KHz deviation from a signal generator is applied. TP-2 stenciled on the board should have a clean square wave.

TX Audio Output: In a wide band system, set the modulation pot R-43 to 3.3 KHz (66% of 5 KHz) of deviation per EIA specifications. In a narrow band system, set the modulation pot R-43 to 1.65 KHz (66% of 2.5 KHz) of deviation per EIA specifications. Set CTCSS deviation to 750 Hz – 1 kHz. In Low-Z mic circuits, it may be necessary to install JU-2 and/or increase C-36.

COR/COS: If the radio only makes a minute change, it may be necessary to install JU-11 and/or adjust R-18, R-19, & R-20 to cause Q-1 to change states.

RADIO PROGRAMMING

The UD-1B-DMH is a generic product that wires into most radios. Any radio specific programming, if available, would be found on any Application Notes available for those radios. You may visit our website or call us for application notes.

OPERATION

ANI Encode: When the PTT Input is grounded, the unit will assert the PTT Output and send the programmed ANI tones out the TX Tone Output.

ENI Encode: When the Emergency Input is grounded, the unit will assert the PTT Output and send the programmed Emergency ANI tones out the TX Tone Output.

Decode: Upon decode the unit will ring, via the Alert Tone/Speaker Audio line, according to the ring code programmed. The unit will also give the following outputs depending on the hardware configuration:

1. Momentary Horn Output: This will give an open collector output to ground for 0-9 seconds depending on the programmed horn time.

2. Latched Monitor/Squelch Output: This output can either go from low to high or from high to low by changing the direction of D-5 by installing JU-12.

3. Latched Mic Mute: This will give an open collector to ground. It will be necessary to install a 10 KΩ Ohm resistor to the open collector. Set the Monitor Polarity to Ground and the Input as "Controls Squelch". The Squelch Control should be "Unmute when called" or "Stay muted until called". The Monitor or Inactivity field can be programmed to any setting.

4. Latched Disable Output: If used, the Mic Mute is not available. It will be necessary to reconfigure the hardware jumpers from the Mic Mute to the Disable line by removing JU-4 and installing JU-5. To use this output it is necessary to program the ring code as "Unit deadbeat disable". Upon receiving the decode sequence the output will latched and stay latched until it receives the sequence again.

5. Latched Relay Output: Installing JU-9 reroutes the Mic Mute output to the horn output relay (RLY1). The Horn Switch should be in the "On" position. Upon decoding the Mic Mute output will cause the relay to latch depending on the programming of "Monitor or Inactivity Resets Unit". If set for "Yes" the unit will reset when the Monitor button or Monitor Input are grounded. If set for "Resets Automatically" the unit will reset after 25 seconds of no PTT activity or when the Monitor button or Monitor Input are grounded. Additionally when the Monitor button or Monitor Input is grounded when no decode is present the relay will activate.

Resetting of Outputs: The momentary output will automatically reset after 0-9 seconds depending on programming. The Mic Mute and Monitor/Squelch outputs can be reset by recycling power, sending another sequence with the ring code of "Turn off call lamp/mute", resetting on a loss of carrier, by grounding the monitor input (switch), or after 25 seconds of inactivity. These reset options depend upon the programming of the unit.

Transpond: If programmed, upon decode the unit can transpond a tone sequence back to the caller to indicate the unit decoded. Transpond only occurs on Decode #1.

COR Input: This input controls two functions, busy lockout and reset of a loss of carrier. The COR polarity must be programmed for the active carrier polarity of the radio.

1. Busy Lockout: If COR is active and the unit tries to encode with busy lockout enabled, the unit will be prevented from keying up.

2. Reset on Loss of Carrier: The unit can reset the latched outputs after a loss of carrier of 0-9 seconds depending on programming.

TECHNICAL NOTES

Decode Timings: We recommend using the following timings:

5-tone: 5 msec for 30-70 msec tones
5-tone: 10 msec for 70-100 msec tones
Pulse (1500 & 2805 Hz): 10 msec
2-tone: 200 msec
DTMF: 1 sec

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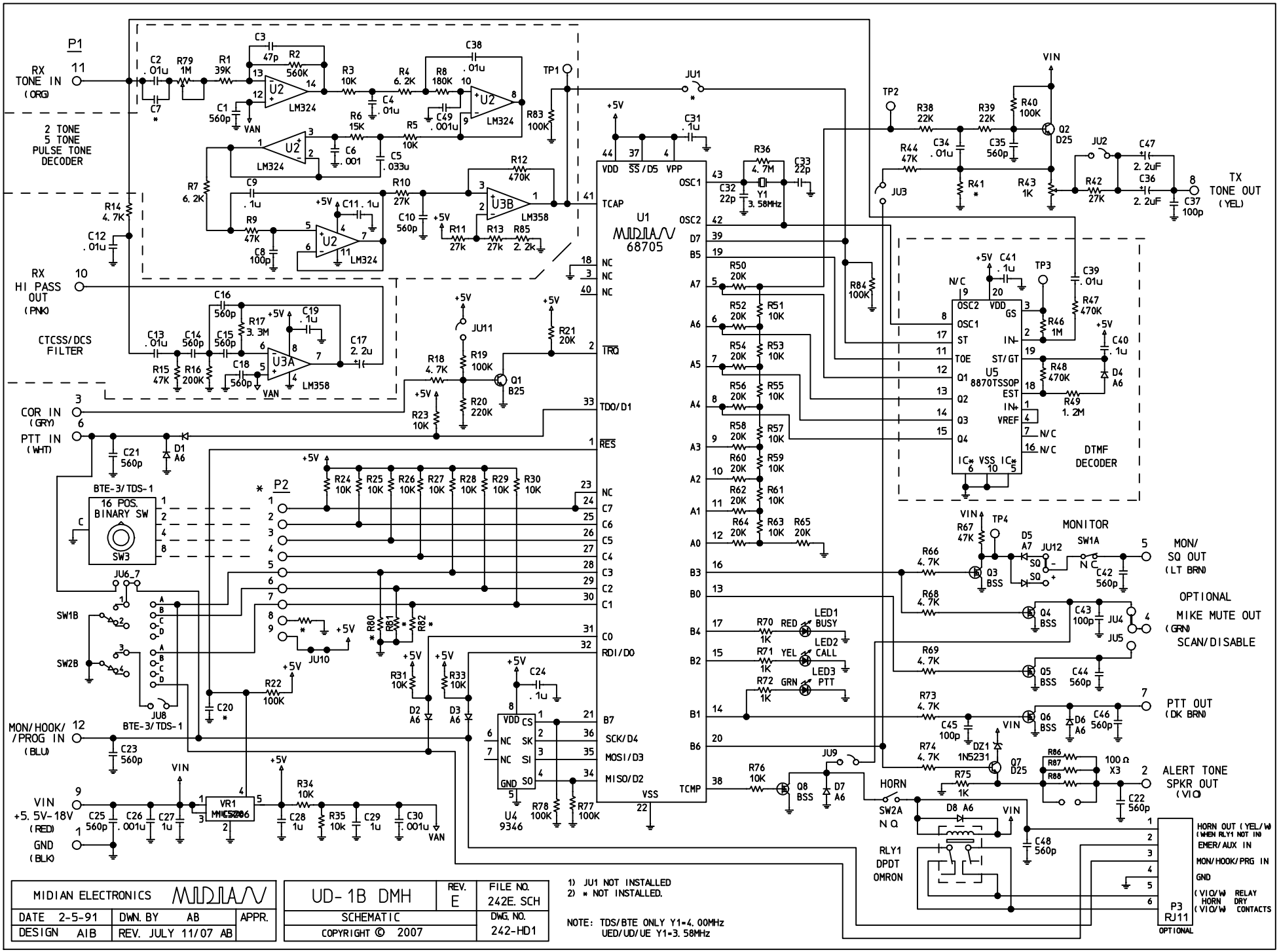

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1) JU1 NOT INSTALLED
2) * NOT INSTALLED.

NOTE: TDS/BTE ONLY Y1=4.00MHz
UED/UD/UE Y1=3.58MHz

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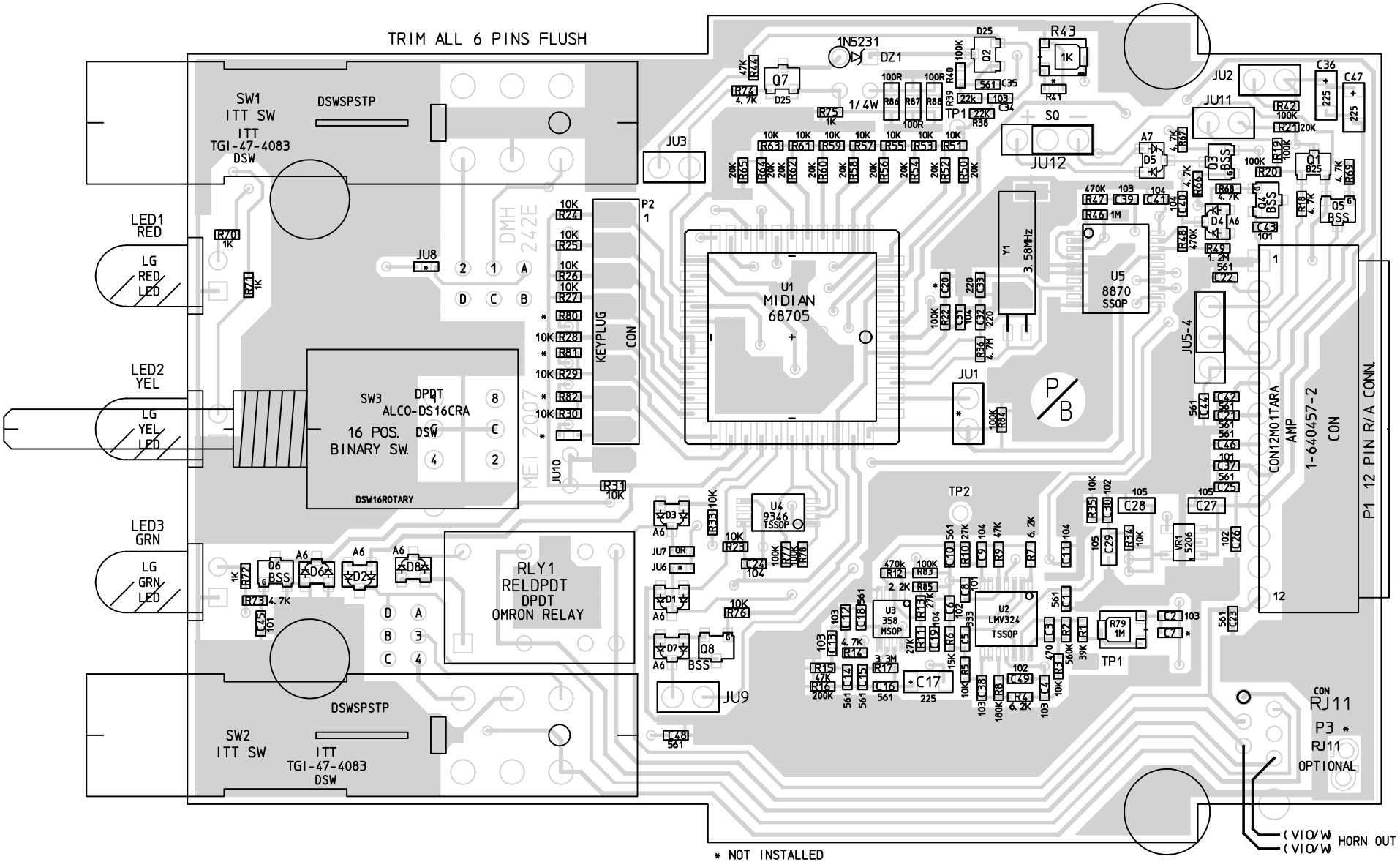

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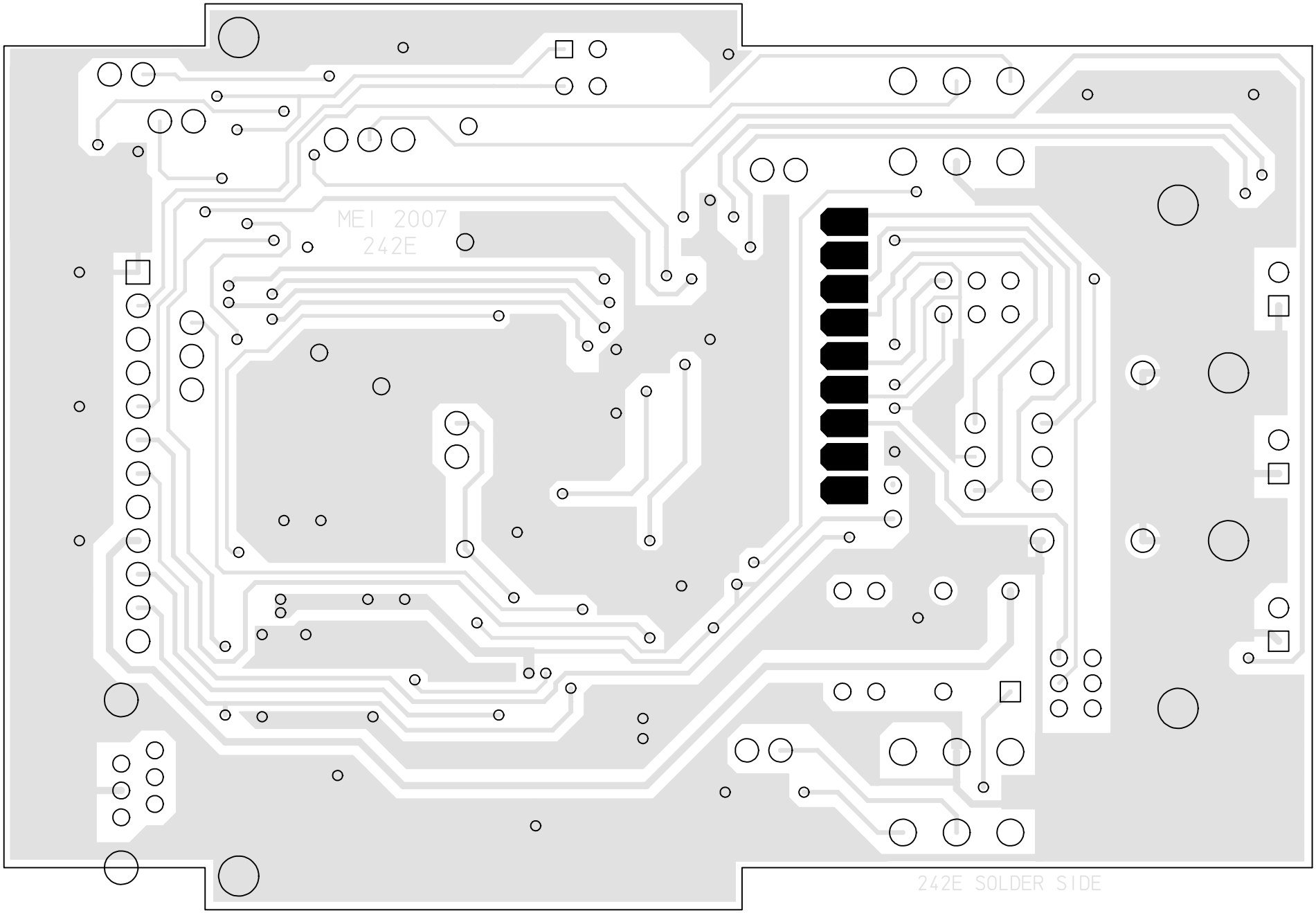

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