UED-1B-DMV

Multi-Format Encoder & Decoder

Manual Revision: 2007-10-01

Covers Software Revisions:
UED-1: 4.0

SPECIFICATIONS

Operating Voltage	+5.5-18 VDC
Operating Current	24 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 UED-1 Series offers ANI encoding, dialing, decode and transpond of tone formats such as DTMF, 5-tone, 2-tone, Pulse Tone, and Burst Tone. The UED-1 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

For programming via a keypad, please reference the UE/UED Series Keypad Programming Manual.

Midian's UED-1B-DMV 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 software, select the appropriate product name from the list and click OK.

Set the parameters of the UED-1 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, it will be necessary to remove JU6 and install JU8 or you can clip the Green KL-3 lead to JU8. The Black wire goes to a common ground with the KL-3's Black lead. The Yellow clip lead is not used with these products, as the UED-1 is non-readable.

Ground the PTT Input (White Wire); turn on power, and within 5 seconds click "Program Unit" in the menu bar to send the file to the UED-1 or EED-1.

HARDWARE INSTALLATION

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

P1-1 – Black – Ground – Connect to the nearest ground point.

P1-9 – Red – 5.5-18 VDC – Connect to switched B+ in the radio.

P1-3 – Gray – COR/COS Input – Connect to point in the squelch or CTCSS circuit that changes logic level when carrier is received.

P1-11 – 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.

P1-5 – 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 by changing its direction. R-65 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.

P1-12 – Blue – Auxiliary/Emergency Input - When taken to Ground, this input can send Emergency or encode in a secondary dialing format. This depends on the Auxiliary Input setting in the KL-3 under the Control tab. This lead can also be used to disable the transpond. The product comes from the factory setup for this feature with JU6 installed.

This lead can also be used for the Deadbeat Disable function of the UED-1. When activated Q6 latches

low until commanded to unlatch. To activate this feature, uninstall JU6 and install JU7.

This blue lead can also be used for the Program Input by uninstalling JU6 or JU7 and installing JU8. This can be connected to the monitor button, squelch pot switch, or the KL-3's Green Lead.

P1-4 – Green - Momentary Horn – When used as Horn, this provides a 0-9 second ground during ringing through FET1 (500 mA).

P1-8 – 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.

P1-2 – 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 Q5 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.

P1-6 – 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.

P1-7 – 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, Q4, is rated at 100 mA continuous.

HARDWARE ALIGNMENT

RX Audio Input: On the UED-1B-DMV adjust R5 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. (Blowing squelch noise should fully clip).

TX Audio Output: In a wide band system, set the modulation pot R42 to 3.3 KHz (66% of 5 KHz) of deviation per EIA specifications. In a narrow band system, set the modulation pot R42 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 JU3.

COR/COS: If the radio only makes a minute change, it may be necessary to adjust R18, R19, & R20 to cause Q1 to change states.

RADIO PROGRAMMING

The UED-1B-DMV products are generic modules that wire 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.

Keypad Dialing: To send a page or make a selective call via the keypad enter the desired sequence followed by the * key. The * key acts as the send key. If a mistake is made during entry, press the # key to clear the entry. When the * key is pressed the unit will assert the PTT Output and send the sequence out the TX Tone Output.

Memory Dialing: The technical notes section explains how to enter the memory dials into memory. To send a sequence from memory enter the * key followed by a 0-9 that corresponds to the sequence in memory you wish to send. When the memory dial is entered the unit will assert the PTT Output and send the sequence 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.

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 Horn Output is not available. It will be necessary to reconfigure the hardware jumpers from the Horn to the Disable line. 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.

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, 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

Memory Dial: The UED-1 and EED-1 support a 10 number memory dial and last number redial. Last number redial is accomplished by entering **. To enter the programming mode for memory dial enter the following sequence:

000000

The unit will beep 3 times to confirm entry into programming mode.

To enter a memory dial enter the sequence followed by *n, where n equals the memory location (0-9). For example 1234*1 would enter a sequence of 1234 in the first memory dial register. For special characters such as A, B, C and D press the PTT while pushing the "2" key for A, the "5" key for B, the "8" key for C, and the "0" key for D. The European group tone "G" can also be used by holding the PTT and pressing the "*" key. To exit memory dial programming, enter the following sequence:

000000

The unit will respond with a long beep and resume normal operation.

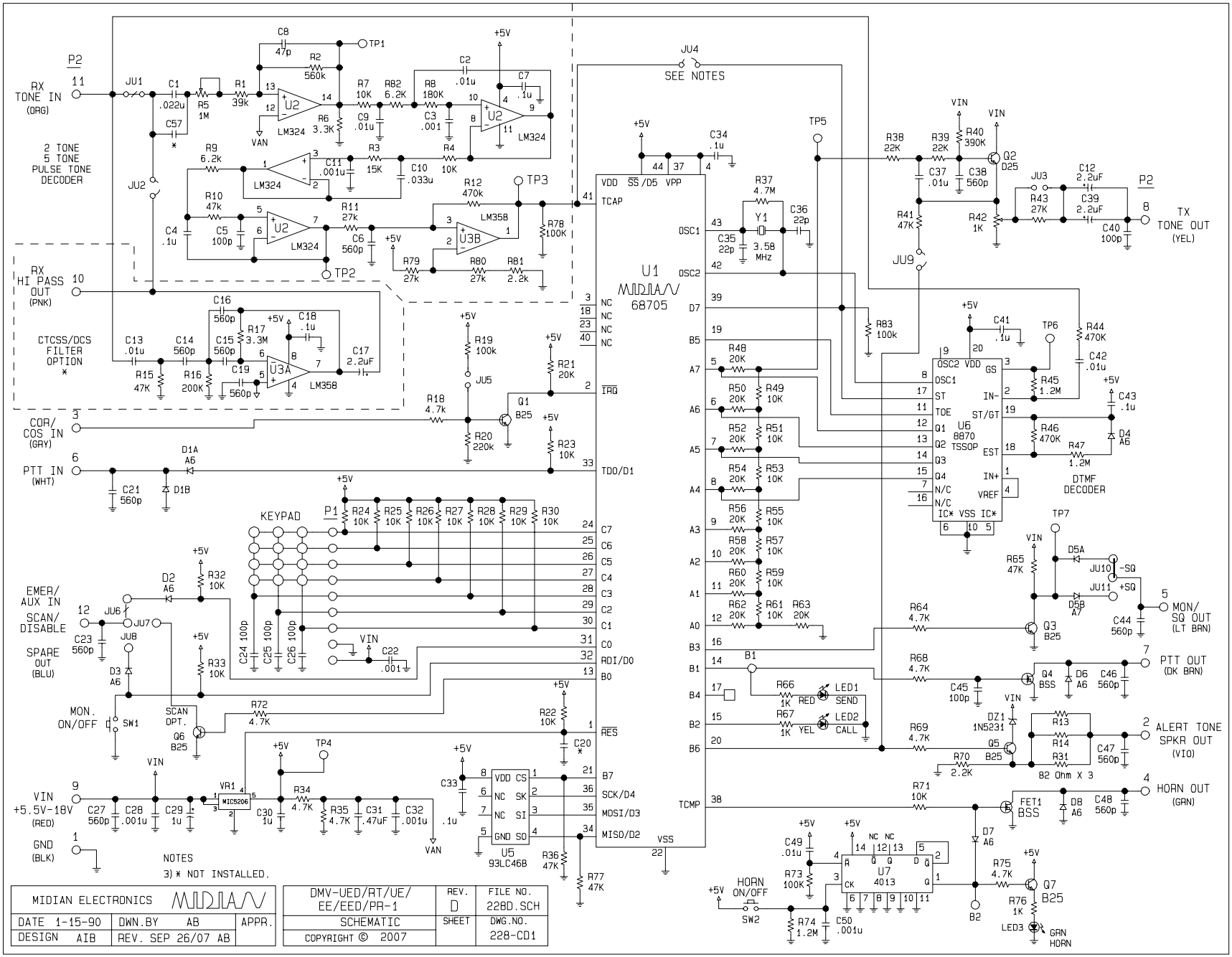
To dial from memory, simply enter *n, where n equals the memory location (0-9).

MIDIAN CONTACT INFORMATION

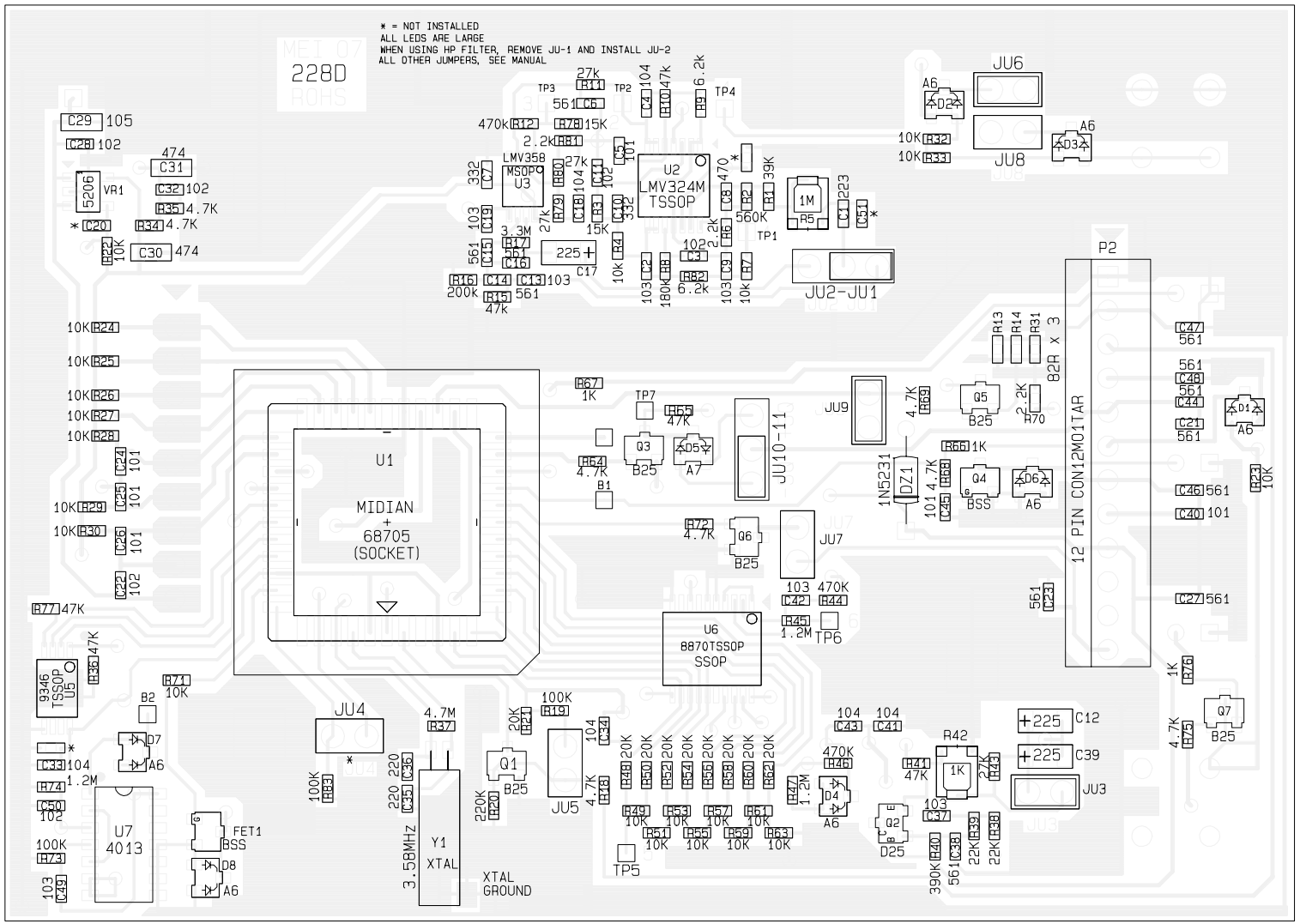
Midian Electronics Inc.
2302 East 22nd Street
Tucson, Arizona 85713 USA

Orders: 1-800-MIDIANS
Phone: 520-884-7981
Fax: 520-884-0422
E-mail: sales@midians.com
Web: http://www.midians.com/

- This page intentionally left blank -

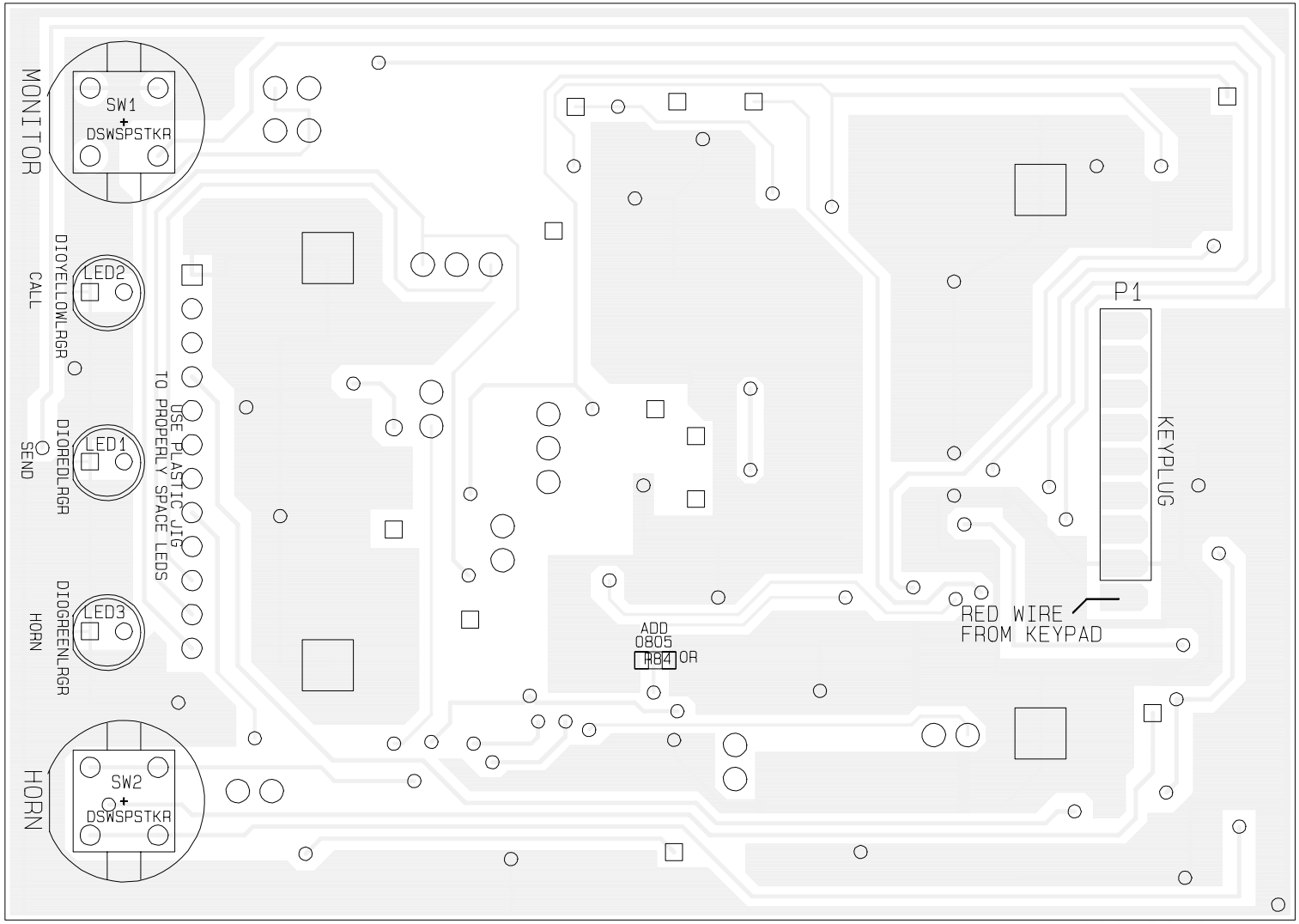

P2
RX TONE IN (ORG)
2 TONE 5 TONE PULSE TONE DECODER
RX HI PASS OUT (PNK)
CTCSS/DCS FILTER OPTION *
COR/ COS IN (GRY)
PTT IN (WHT)
EMER/ AUX IN
SCAN/ DISABLE
SPARE OUT (BLU)
MON. ON/OFF
SCAN OPT.
VIN +5.5V-18V (RED)
GND (BLK)
NOTES
3) * NOT INSTALLED.
KEYPAD
U1 MIDIA 68705
JU4 SEE NOTES
TP1
TP2
TP3
TP4
TP5
TP6
TP7
U2 LM324
U3A LM358
U3B LM358
U5 93LC46B
U6 8870 TSSOP DTMF DECODER
U7 4013
Y1 3.58 MHz
VR1 MIC5206
Q1 B25
Q2 D25
Q3 B25
Q4 BSS
Q5 B25
Q6 B25
Q7 B25
FET1 BSS
DZ1 1N5231
LED1 SEND
LED2 CALL
SW1
SW2
TX TONE OUT (YEL)
MON/ SQ OUT (LT BRN)
PTT OUT (DK BRN)
ALERT TONE SPKR OUT (VIO)
HORN OUT (GRN)
82 Ohm X 3
HORN ON/OFF
GRN HORN
MIDIAN ELECTRONICS
DMV-UED/RT/UE/ EE/EED/PR-1
REV. D
FILE NO. 228D.SCH
DATE 1-15-90
DWN.BY AB
APPR.
DESIGN AIB
REV. SEP 26/07 AB
SCHEMATIC
SHEET
DWG.NO. 228-CD1
COPYRIGHT © 2007

- This page intentionally left blank -



MIDIAN ELECTRONICS MIDIAN			
DATE 10/15/90	DWN.BY AB	APPR.	
DESIGN AIB	REV. JUN 26/07 AB		

DMV-UED/RT/UE EE/EED/PR-1	REV. D	FILE NO. 228D.PCB
PICTORIAL	ECO –	DWG.NO. 228-CHP
COPYRIGHT © 2007		



MIDIAN ELECTRONICS			
DATE 10/15/90	DWN.BY AB	APPR.	
DESIGN AIB	REV. JUN 26/07 AB		

DMV-UED/RT/UE EE/EED/PR-1	REV. D	FILE NO. 228D.PCB
PICTORIAL	ECO –	DWG.NO. 228-CHP
COPYRIGHT © 2007		