



TTD-4

1-8 Digit DTMF Decoder

Manual Revision: 2008-12-03

Covers Hardware Revision:
TTD-4: C & Higher

SPECIFICATIONS

Operating Voltage	6-24 VDC
Operating Current	6 mA
Operating Temperature	-30 - +60 C
Input Level	25-500 mV RMS
Input Impedance	500 K Ω
Ringing Outputs	1600 Hz
Momentary Output	250 mA
Latched Call Light	100 mA
Group Call Time	2.6 seconds
Dimensions	2" L x 1.28" W x 0.33" H

GENERAL INFORMATION

The TTD-4 is a 1-8 digit DTMF decoder capable of decoding the 16 DTMF digits (0-9, *, #, A-D). The unit offers both momentary and latched outputs, as well as a command reset of the latched output.

HARDWARE INSTALLATION

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

Connector P1

P1-1 – Green – Transpond Out – Connect to the radio's PTT circuit (Outputs approximately 1.2 seconds of PTT after decode).

P1-2 – Red – VIN +5.5-24 VDC – Connect to switched battery point in the radio.

P1-3 – Brown – Monitor 4 Input – Un-squelches the radio via the yellow lead when the monitor input goes low from a high or floating state. Resets the call output and squelch when the input returns to the high state. JU2 should be installed when using this input.

P1-4 – Black – Ground – Connect to the nearest ground plane in the radio.

P1-5 – Blue – Monitor 3 Input – Un-squelches the radio via the yellow lead when the monitor input goes to a high or floating state from a low. Resets the call output and squelch when input returns to a low. JU2 should be installed when using this input. **Note:** Monitor 3 Input must be grounded when not in use.

P1-6 – Orange – 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.

P1-7 – Yellow – Neg. Squelch Output – Connect to a point in the radio that mutes the audio with a low input. Command reset and power interruption resets this output.

P1-8 – Green/White – Pos. Squelch Output – Connect to a point in the radio that mutes the audio with a high input. Command reset and power interruption resets this output.

P1-9 – White – Call Output – This output is latched low upon decoding and may be used as a decode indicator. Command reset and power interruption resets this output.

P1-10 – Gray/White – Horn Output – Connect to car horn relay via ON/OFF switch. **Note:** Check current demand of the horn relay before connecting directly to horn relay coil. Install a diode in parallel to the relay coil to eliminate counter EMF.

P1-11 – Gray – Monitor 2 Input – Un-squelches the radio via the yellow lead when the monitor input goes to a high or floating state from a low. JU1 should be installed when using this input.

P1-12 – Orange/White – Monitor 1 Input – Un-squelches the radio via the yellow lead when the monitor input goes low from a high or floating state. JU1 should be installed when using this input.

P1-13 – Violet – Alert Tone Output – Connect to a non-squelched high impedance point in the receiver audio speaker driver circuit.

PRODUCT PROGRAMMING

The TTD-4 is programmable using a series of dipswitches and jumpers.

Setting the Decode Length: In the upper-right hand corner of the PCB, on the dipswitch side, on the board there are a series of solder pads. Solder a jumper from the “Correct Number” pad to the pad that corresponds to the number of digits the unit should decode. **Note:** There is a trace that is connected to the “7” pad to set the decode length to 7 digits. It is necessary to remove this trace if a length other than 7 is needed.

Programming the Decode Sequence: There are 4 dipswitches on the TTD-4 and each dipswitch has 8 individual switches. On any given dipswitch the first 4 switches control one digit and the second 4 control another digit. The switches come from the factory in the off position which is the “D” digit. Set the switches in the positions that correspond to the desired digit as described in the table below.

DECODE NUMBER PROGRAMMING				
DTMF Digit	A Position	B Position	C Position	D Position
1	Off	Off	Off	On
2	Off	Off	On	Off
3	Off	Off	On	On
4	Off	On	Off	Off
5	Off	On	Off	On
6	Off	On	On	Off
7	Off	On	On	On
8	On	Off	Off	Off
9	On	Off	Off	On
0	On	Off	On	Off
*	On	Off	On	On
#	On	On	Off	Off
A	On	On	Off	On
B	On	On	On	Off
C	On	On	On	On
D	Off	Off	Off	Off

Command Reset: Solder a jumper from the Command Reset pad to the number of digits that should be decoded to reset the unit. For example if the TTD-4 will decode a 4-digit sequence of 1234 to activate the outputs, the command reset should be jumpered to a number higher than 4. If the command reset is set to 5 the TTD-4 will reset when it receives 1234 plus a programmed fifth digit (ie. 12345). The Command Reset number should always be higher than the Correct Number for the decode sequence. **Note:** There is a trace that is connected to the “8” pad to set the Command Reset decode length to 8 digits. It is necessary to remove this trace if a Command Reset length other than 8 is needed.

OPERATION

Momentary Output: Upon decoding the proper DTMF sequence the momentary output (horn) will go low for approximately 3 seconds.

Latched Output: Upon decode the Squelch Output will un-mute the radio and the Call Output will latch low.

Alert Tone Output: Upon decode this output will go low for approximately 2 seconds and produce a ~2000 KHz tone. When connected to the radio's PTT circuit and the alert tone is tied to the radio's modulator circuit, the unit will produce an alert tone that will be sent back to the calling party upon decode.

Resetting the Outputs: The unit may be reset by cycling the power or sending a Command Reset sequence to the unit. Activating the monitor input will also reset the unit.

Group Call Operation: If there are a number of units in the system and there numbering, for example, is 1010-1019 dialing 1 then 0 then 1 with the final 1 being generated for at least 4 seconds, all of the units will decode. Likewise if there are units numbered 2300-2399, dialing 2 followed by a 4 second 3 will cause all 100 units to decode.

TECHNICAL NOTES

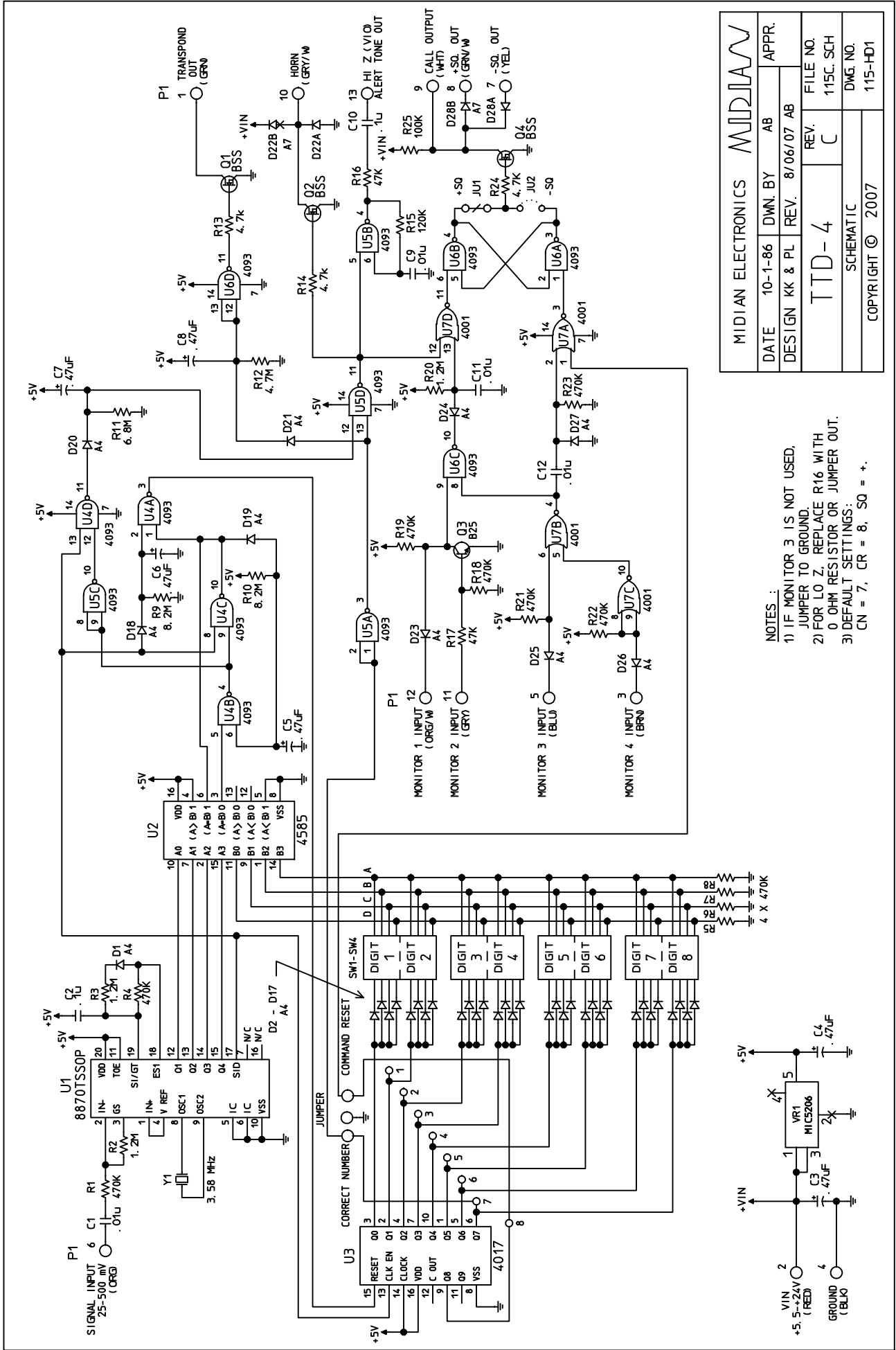
Radio Compatibility: Midian has taken the utmost care to ensure the option board integrates into the radio with minimal impact to the features of the radio. However, some features may not be available in the radio when an option board is used. If a feature is not available, please contact Midian to see if the feature can be added.

Power Up Time: The TTD-4 needs approximately 3 seconds upon power up before being able to decode.

MIDIAN CONTACT INFORMATION

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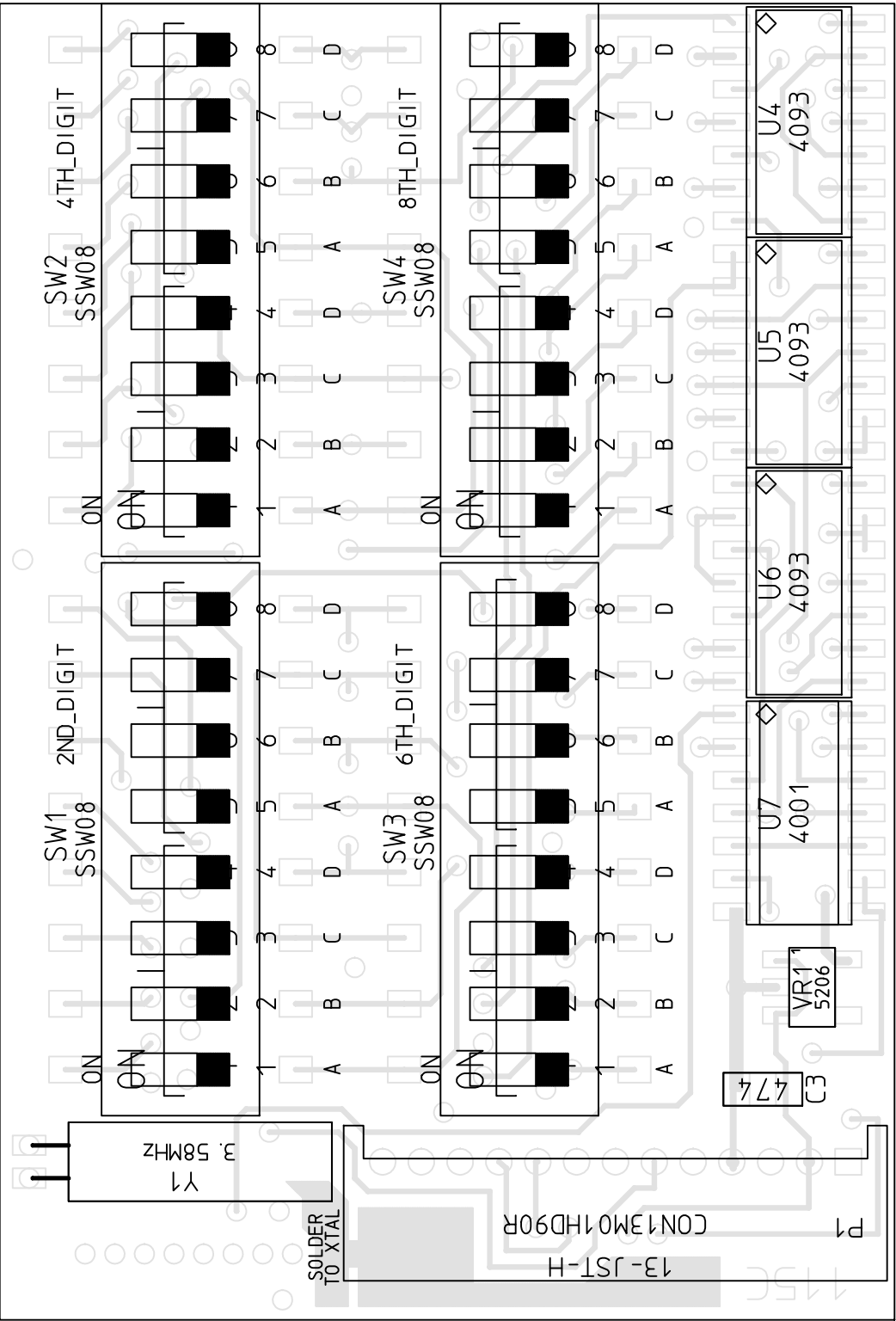


NOTES :
 1) IF MONITOR 3 IS NOT USED,
 JUMPER TO GROUND.
 2) FOR LO Z, REPLACE R16 WITH
 0 OHM RESISTOR OR JUMPER OUT.
 3) DEFAULT SETTINGS:
 CN = 7, CR = 8, SQ = +.

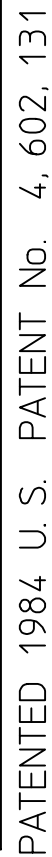
MIDIAN ELECTRONICS			
DATE	10-1-86	DWN. BY	AB
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TTD-4		REV.	C
SCHEMATIC		FILE NO.	115C. SCH
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ALERT TONE (V IO)
MONITOR 1 (ORG/ WHT)
MONITOR 2 (GRN)
HORN (GRN/ WHT)
CALL OUT (WHT)
+SQ OUT (GRN/ WHT)
-SQ OUT (YEL)
SIGNAL IN (ORG)
MONITOR 3 (BLU)
GROUND (BLK)
MONITOR 4 (BRN)
+VIN (RED)
TRANSPOND OUT (GRN)



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