PDE-1

PAGING AND DIALING ENCODER

INSTRUCTION MANUAL

Model Features

- Supports 10 pager formats simultaneously
- 155 entry alias database
- Two-tone formats include Motorola, GE, Reach
- Send any arbitrary 2 tones for Plectron
- Generates POCSAG
- Supports DTMF and several 5-tone formats
- Easy to read backlit LCD display
- Serial printer logging (w/optional cable)

MANUAL REVISION: 2013-07-19

COVERS PRODUCT SOFTWARE VERSION(S):
1.2 1.3 1.4 1.41 _____

WITH ENCODER/DECODER VERSION(S):
1.1 _____ _____ _____ _____

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1 SPECIFICATIONS

Voltage/Current

Operating Voltage (nominal) .....12 VDC
Operating Voltage (min-max) .....12-15 VDC
Operating Current (standby @12 VDC).....100 mA
Operating Current (peak @15 VDC).....500 mA

Inputs

Input Level (RX) ..... 100-3000 mV p-p
Input Impedance (RX).....> 10kΩ

Outputs

Output Level (TX, unloaded)..... 150-2500 mV p-p
Output Impedance (TX)..... 27kΩ with jumper JU-4 cut

Mechanical

Dimensions: .....2⅞"H x 6½W x 8¾"L
Operating Temp .....0° to 50° C

Encode Formats

AVCALL, GE, REACH, MOTOROLA QUICK CALL 1 (2+2) AND QUICK CALL 2 (1+1), PULSE 1500/2805, DTMF, CCIR, EEA, EIA, ZVEI, DZVEI, DDZVEI, NATEL, MODAT, and POCSAG. PLECTRON and other 2-tone formats supported with 'any 2-tone' format.

Other

Alias Database Size ..... .155

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2 OVERVIEW

The PDE-1 is a multi-format paging and dialing encoder. It will support up to 10 different formats simultaneously from the over 35 available. The user-friendly menu system makes it as easy to use as a cell phone.

2-Tone Formats: AVCALL, GE, REACH, and most Motorola 1+1 and 2+2 plans. In addition, the 'any 2-tone' feature allows for direct entry of any 2 arbitrary frequencies to support PLECTRON and other 2-tone formats without a standardized code plan.

Other Tone Formats: DTMF, Pulse tone (1500 or 2805), 5/6-tone EIA, EUROSIGNAL, ZVEI, DZVEI, DDZVEI, EEA, NATEL, and MODAT.

Digital Formats: POCSAG 512, 1200, 2400, numeric or alphanumeric.

10 Flexible Pager Profiles: Allows up to 10 different pager types in the same system.

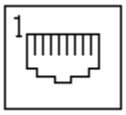
User Database: Allows up to 155 names and numbers to be stored for easy access. Call a pager by name or number.

Other Features: 10-entry speed dial list. Saved message list allows 10 'canned' alphanumeric messages up to 25 characters long to be saved for instant access. Security feature helps prevent unauthorized personnel from tampering with the PDE configuration. Can operate as a local remote control with optional microphone. Outgoing pages can be logged to a serial printer or PC with optional cable.

3 INSTALLATION INSTRUCTIONS

Installation Note: Midian products utilize CMOS integrated circuits, which are susceptible to damage from high static charges. Be sure to follow standard antistatic procedures when handling, including using grounded workstations and soldering irons and wearing grounding bracelets.

3.1 RADIO INTERFACE



Radio Interface connector P1 is an 8-pin RJ-45 style connector in the center of the back panel.

+V IN (P1-5) [Red]

The PDE can be powered either by an optional wall transformer or by the radio power supply. Connect this wire to the radio power source provided it is between 12 and 15 VDC.

If using a wall transformer, make sure the voltage is between 12 and 15 VDC and the current rating is at least 500mA. Also, be certain that positive is connected to the center pin (inside sleeve).

GROUND (P1-6) [Black]

Connect to radio ground.

AUDIO INPUT/RX IN (P1-8) [Blue]

This connection is only required if you wish to hear radio audio through the PDE speaker. Connect to a point in the radio where squelch controlled receive audio is present at a constant level.

AUDIO OUTPUT/TX OUT (P1-4) [Green]

For tone formats you can usually connect to the mic-hi input of the radio. The output impedance of the PDE can be adjusted if necessary by replacing leaded resistor R81 with an appropriate value. For digital formats (POCSAG), it may be necessary to connect directly to the modulator inside the radio.

PTT OUTPUT (P1-3) [Yellow]

This open collector output provides a ground to key-up the radio when transmitting. If connecting to a relay in the radio, make sure the coil is bypassed with a diode to eliminate counter-EMF.

COR INPUT (P1-1) [Gray]

This connection is required only if you desire to activate the *Busy Lockout* feature of the PDE. Connect to a point in the radio squelch or CTCSS circuit that changes logic level when carrier (or CTCSS) is detected. A radio whose circuitry provides a logic-low or logic-high can readily turn Q1 on and off. If only a high level is provided, it may be necessary to move R40 from its pull-up to its pull-down position.

MONITOR OUTPUT (P1-7) [Orange]

This output can be used to control the monitor function of the radio using the <MONITOR> button on the PDE. This is an open collector output which changes state each time the <MONITOR> button is pressed.

SQ OUT/LTR IN (P1-2) [Brown]

This wire is not used by the PDE.

3.2 JUMPER SETTINGS

There are two user configurable jumpers, JU1 and JU4. Both are installed at the factory. JU1 allows signaling audio to be heard in the local speaker. If this is not desired, cut JU1.

JU4 controls the output impedance of transmit audio. See **OUTPUT LEVEL** below to determine if JU4 will need to be cut.

3.3 ADJUSTMENTS

Once the unit has been connected to the radio, several adjustments must be made to achieve proper operation. It will be necessary to open the unit. Use the pictorial to identify the location of the following trim pots: R32 near connector P3, R51 near IC U6, and R105 near the volume control.

OUTPUT LEVEL

Use a service monitor to measure the modulation level generated by the unit. Cause the unit to generate tones by first pressing <SEND> at the **`CALL A UNIT`** prompt and then typing in 1000010000 and pressing <SEND>. Adjust R51 so that the modulation level is at 2/3 of the maximum system modulation (typically 3.3 kHz).

If the output level cannot be adjusted low enough, it will be necessary to cut JU4. This changes the output from low impedance to high impedance.

MICROPHONE GAIN

If an optional microphone is installed, the microphone audio level must be adjusted. Cause the unit to go into transmit mode by holding down the <SEND> key. Speak loudly into the microphone at a normal distance. Adjust R105 such that maximum system modulation is achieved at peak voice.

SPEAKER PRE-AMP

Though the PDE has a volume control knob, it also has an input audio pre-amplifier. While listening to audio on the channel, adjust R32 so that the minimum and maximum volume control settings are at desired levels.

PRINTER OPTION

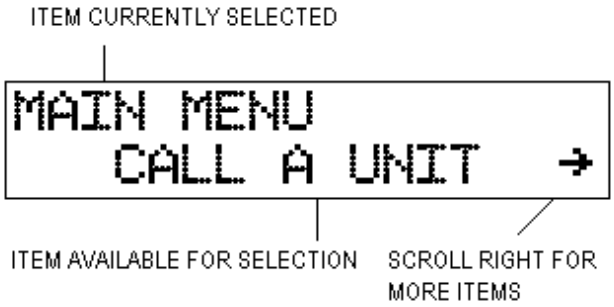
With an optional cable, the PDE can log paging activity to a serial printer or even a PC equipped with a COM port. The PDE printer port configuration is fixed at 9600 baud, 8 data bits, 1 stop bit, and no parity. To use the printer, you will have to turn the printer option on in the CONSOLE SETUP. Next, plug the modular plug of the cable into P4 (closest to the volume control). You may need a 9 to 25-pin adapter to connect to your printer. If you choose to log to a PC, you will need a null modem.

4 OPERATION

4.1 BASIC OPERATION

4.1.1 Navigating the PDE

The PDE starts off at the Main Menu as illustrated below.



SCROLL INDICATORS – An arrow appearing on either side of the display indicates more choices are available by pressing the corresponding <SCROLL> button.

<SEND> Button – Selects the item shown on the display. Press <SEND> when `CALL A UNIT` is displayed and you will enter **Call Mode.** In Call Mode, you will be prompted for CAP code (or a User Name). As shipped from the factory, you can place a Motorola general 1+1 page right now by typing a 3-digit CAP code, followed by <SEND>. If you press <SEND> without typing in a CAP code, it will act like the PTT button of the radio.

<#> POUND Button – This button is used any time you wish to escape the current selection or abort data entry. Press this key to escape the Call Mode and return the PDE to the Main Menu. Repeatedly pressing the <#> button will always return the PDE to the Main Menu.

4.1.2 Other Controls and Indicators

<MONITOR> - This button always controls the monitor function of the radio (if monitor output connected). Press <MONITOR> to toggle the state of the monitor output to the radio.

POWER / ALARM LED – Glows red when power is turned on.

TRANSMIT / BUSY LED – This LED is off when there is no activity. It glows red during transmit. It blinks green any time the radio channel is busy (provided COR input is active and connected).

NUMBER Keys – The number keys are used for both numeric and alphanumeric data entry. They may also be used as Speed Dial buttons if the feature is enabled.

<*> STAR Button – Pressing the <*> will toggle the data entry mode between *numeric* and *alphanumeric* where this is appropriate (such as when entering POCSAG messages). It can also be used to enter special DTMF characters *,#,A,B, and C ('D' is not supported).

4.1.3 Data Entry

The PDE supports two modes of data entry: *numeric* and *alphanumeric*. When numeric entry is called for such as when entering a CAP code, simply press the appropriate number keys. Alphanumeric entry is called

for when entering User Names or messages for POCSAG alpha pagers.

Entering alphabetic characters using the numeric keypad is easy. All of the letters of the alphabet appear above the numbers on the keypad. For example, the letters 'A' 'B' and 'C' appear on the <2> key.

Alphabetic characters are entered by pressing 2 digits. The first digit is the key with the desired letter appearing on it. The 2nd digit is the position of the letter on that key. For example, the code for the letter 'C' is 23 since it is the 3rd letter on the <2> key. The letter 'T' is the 1st letter on the <8> key, so its code is 81.

To enter numeric characters in alphanumeric mode, press the <0> key followed by the desired digit. Punctuation characters such as comma <,> and <-> do not appear on the keypad. Special codes have been assigned to allow entry of those characters. Please refer to the following chart.

During data entry, the left <SCROLL> button acts as backspace, and the <#> button aborts data entry. In some cases, you can use the <*> button to toggle between numeric and alphanumeric entry (more on this later on).

A=21	I=43	Q=72	Y=93	7=07	- =15
B=22	J=51	R=73	Z=94	8=08	+ =16
C=23	K=52	S=74	1=01	9=09	] =17
D=31	L=53	T=81	2=02	0=00	* =18
E=32	M=61	U=82	3=03	. =11	/ =19
F=33	N=62	V=83	4=04	, =12	Space=10
G=41	O=63	W=91	5=05	?=13	
H=42	P=71	X=92	6=06	[=14	

The code 10 is used to insert a space between characters.

4.1.4 Entering Special DTMF Digits

The PDE supports the following special DTMF 'digits' in numeric entry mode: *, #, A, B, and C (D is not supported). These are entered using 2-key sequences as follows:

* = * *	# = * #	A = * 1	B = * 2	C = * 3

These special digits can only be entered when adding a User ID to the database. They cannot be dialed directly from the call mode (unless the database is empty). Also, these special sequences should not be used unless you are using DTMF as the encode format.

4.2 CALLING A UNIT

4.2.1 Automatic Pager Profile Selection

At this time, you may wish to connect the audio output (green wire) of the PDE to an amplified speaker so you can hear the paging tones go out. Select `CALL A UNIT` from the Main Menu. Type in 3 digits and press <SEND>. You should hear a 1 second tone followed by a 3 second tone. You have just sent a Motorola General Plan 1+1 page.

Now try typing in a 4-digit number. You should hear DTMF tones. You may ask, how does the PDE know which paging format to use? Later on, when there are entries in the User Database, the PDE will determine the format based on the information in the database. Right out of the box, the PDE database is blank so another method is used.

The PDE picks the **Pager Profile** automatically based on the number of digits entered. Enter 3 digits and profile 3 is chosen. Enter 10 digits and profile 10 is used. This was done so that the PDE would work right out of the box. Each of the 10 pager profiles were initialized at the factory with examples. Try entering 7 digits and you can do a POCSAG page.

4.2.2 Changing Pager Profiles

Say you have pagers that work with Motorola code plan 'L'. You can change profile 3 to match this format. Navigate to `SETUP->PAGER SETUP->Profile 3` and press <SEND>. You will first be prompted for a Profile Name. You can call it whatever you want, let's say MOT L:

61 63 81 10 53 <SEND>

Next you will be prompted for pager type. It should already say '`2-Tone`', just press <SEND>. Next you will be prompted for the pager Format. Scroll right until you find '`MOTOROLA L`' and press <SEND>. Next you will be prompted for the 1st and 2nd tone times. They have already been set for 1000 and 3000 milliseconds respectively, which is correct for Motorola. Press <SEND> for each one. You will hear a confirmation signal. Changes do not take effect until the confirmation beeps are heard. Now all 3-digit pages will be in the Motorola L format.

This was just one example of a pager profile. The information prompted for will be depend on pager type. For example, a POCSAG pager profile includes a baud rate setting. Please refer to section 5.5.4, **PAGER SETUP.**

4.3 USER DATABASE

The user database makes day-to-day operation of the PDE much easier. You can use easy-to-remember names instead of just numbers. It is advised that the pager profiles be setup before setting up the user database.

4.3.1 User Database Features

The primary purpose of the user database is to associate a name (or alias) with a pager profile and CAP code. This way, when you go to place a page, the name of the person can be selected from the database. The PDE can store up to 155 aliases in its database. The PDE retains the database memory even when switched off.

4.3.2 Setting Up the User Database

Begin by compiling a list of names along with the pager profiles and CAP codes. Give some thought on how you are going to abbreviate the names since only 14 characters per name are available. To begin entering data, select **Add User** from the **USERS** menu. See the description of these items in the **USERS menu** section 5.3 for more information.

4.3.3 Calling a Unit in the Database

To place a call to a unit in the database, first select **CALL A UNIT** from the Main Menu. Press the right <SCROLL> button to display the first user in the database. Either the CAP code will be displayed, or the User Name (alias) will be displayed.

This is determined by the **Call Entry Mode** setting. Once there are entries in the database, you should navigate to:

`SETUP->CONSOLE SETUP->Call Entry Mode`

and change this setting to ALPHA. By doing this, you will automatically be prompted for a User Name instead of a CAP code. You can always use the <*> button to toggle the entry mode between numeric (CAP code) and alphanumeric (User Name). The <*> button can also be used to see which CAP code is assigned to the User Name shown in the display.

In either case, after pressing the right <SCROLL> button, the left and right scroll indicators will appear on the bottom line. This indicates that the PDE is in the **Select Mode.** Use the <SCROLL> keys to locate the desired user within the database. When the name is located, press the <SEND> key to place the call. The <#> key may be used at any time prior to pressing <SEND> to cancel the call.

To locate a user in the database more quickly, you can enter one or more of the first few letters of the User Name code prior to pressing the right <SCROLL> button. The PDE will search the database for users matching the first few letters. You can also do the same thing in numeric entry mode, but with numbers.

4.4 SPEED DIAL FEATURE

When the speed dial feature is enabled, you can simply press and hold any of the digits 0-9 for 1.5 seconds to place a call (when in **Call Mode** only). First, you must enter each user assigned to a speed dial button into the database. Then, navigate to

`SETUP->SPEED DIAL SET->Speed Dial`

And turn the feature on. Next, scroll right and select the speed dial button you wish to assign to a user. Locate the user in the database in the same manner as if placing a call.

4.5 SAVED MESSAGES FEATURE

The PDE can stored up to 10 'pre-canned' messages of up to 25 characters each for use with POCSAG paging. See section 5.4 on **SAVED MESSAGES** for information on entering the messages. See section 5.1.1 on **POCSAG Message Entry** for how to recall saved messages when doing a POCSAG page.

4.6 SECURITY FEATURE

The menu system incorporates a lock feature to prevent unauthorized personnel from changing the PDE configuration. The lock feature also serves to simplify day-to-day operation of the unit.

When the **LOCK** command is selected, all of the menus are disabled. The only items available will be **CALL A UNIT** and **UNLOCK**. Selecting **UNLOCK** makes all of the menu items available again.

When locked, the unit is password protected so only authorized personnel may unlock the menus. As shipped from the factory, the security feature is disabled and the LOCK/UNLOCK options do not appear. To enable the feature and select a password, see the **SECURITY SETUP** menu item.

Remember your password! Once security is enabled and the menus are locked, the only way to unlock will be to use the password. If you do forget the password, contact Midian for the reset procedure.

5 MENU SYSTEM

The following sections describe the various functions of the menu system. Factory default settings are underlined.

5.1 CALL A UNIT COMMAND

Places the unit into **Call Mode**. All pages are done from Call Mode. Selecting a unit to call may be done in several ways.

Speed Dial mode – If speed dial is enabled, simply press and hold the number key associated with the unit you wish to call. If the speed dial key continues to be held after the page is complete, it will serve to keep PTT asserted for voice-over paging.

For the following four modes, the <SEND> key is pressed to send the page. If doing voice-over paging, keep the <SEND> key pressed to hold up PTT.

Direct Numeric Entry mode – Simply key in the CAP

Code of the unit you wish to call.

Direct Alphanumeric Entry mode – Key in the User Name as it appears in the user database.

Numeric Select mode – Press the right <SCROLL> button to enter select mode. Now you can use both left and right <SCROLL> buttons to select a CAP code from the database. Also, you may enter a partial CAP code prior to pressing right <SCROLL> to find the 1st entry in the database matching the partial code.

Alphanumeric Select mode – Press the right <SCROLL> button to enter select mode. Now you can use both left and right <SCROLL> buttons to select a CAP code from the database. Also, you may enter a partial name prior to pressing right <SCROLL> to find the 1st entry in the database matching the partial name.

Remember, you can use the <*> to toggle between numeric and alphabetic entry modes. Press <SEND> to make the call. When sending to a POCSAG pager, you will then be prompted for a numeric or alphanumeric message. Entering a message may be done in several ways.

5.1.1 POCSAG Message Entry

Numeric Entry mode – Simply key in the numeric message up to 14 digits.

Alphanumeric Entry mode – Key in an alphanumeric message up to 25 characters.

Select mode – Press the right <SCROLL> button to enter select mode. Now you can use both the left and right <SCROLL> buttons to select a message from the list of 10 'pre-canned' messages in the Saved Messages list.

Press <SEND> after message entry to place the page. **Note:** Numeric POCSAG pagers can decode the following special non-numeric characters: space ? U - [ ]. Alphanumeric entry mode is required to enter these special 'numeric' characters. Note that the U character is typically understood to mean 'urgency'.

Press <#> to escape the Call mode and return to the Main Menu.

5.2 LOCK OR UNLOCK COMMAND

Note The LOCK and UNLOCK menu options do not appear unless enabled in **SECURITY SETUP**.

Selecting LOCK will disable access to the parts of the menu system described in the following sections. Select UNLOCK to enable the entire menu system. You must enter a 4-digit password to unlock the menu system. See **SECURITY SETUP** for more information.

5.3 USERS MENU

5.3.1 Add User menu

Allows the system administrator to add a new user to the database. When ADD USER is selected, you will be prompted to fill in the information for that user such as User Name and CAP Code. See **EDIT USER** for more information.

5.3.2 Delete User menu

Allows you to delete a user record from the database. When DELETE USER is selected, you will be able to select the user you wish to delete in the same manner as if placing a call to a unit. Use the scroll buttons to find the user you wish to delete. Press <SEND> to delete the selected user. You will have to press <SEND> a second time to confirm. Press <#> to cancel if you change your mind.

5.3.3 EDIT USER menu

Allows you to change information about a user. Select the user you wish to edit in the same manner is if placing a call to that user. Use the scroll buttons to find the user you wish to edit. Press <SEND> to edit the information for the selected user.

You will be prompted to fill out each field in turn. After entering the data for a field, press <SEND> to go on to the next field. To leave a field unchanged, simply press <SEND> without entering data.

5.3.3.1 User Name field

This alphanumeric field contains the name of the user associated with a unit. A maximum of 14 characters may be used. A name already in the database will not be accepted. See the **Data Entry** section for more information.

Range: 0-14 characters

Default: blank

5.3.3.2 Pager Profile setting

Select from among the 10 pager profiles by name using the <SCROLL> buttons.

Range: 0-14 characters

Default: N/A

5.3.3.3 CAP Code field or Frequency fields

If the pager type is 2-tone, 5-tone, DTMF, or POCSAG, You will be prompted for a numeric CAP code to be associated with the unit. If using AVCALL, see the section 6.2.1 for entry instructions. If using Motorola Quick Call 1 (2+2), see section 6.2.2 for entry instructions.

Range: 1-10 digits depending on pager format

Default: blank

If the pager type is 'any 2-tone' you will be prompted to enter two 5-digit frequencies. The 1st digit is the 1000's place and the last the 1/10's place. For example 615.8 Hz is entered as 06158, 1985.0 Hz is entered as 19850. Technically, you can enter anything from 0000.0 to 9999.9 Hz, however the practical maximum is about 3000.0 Hz.

Range: 5 digits

Default: blank

5.4 SAVED MESSAGES MENU

Allows you to edit each of the 10 saved alphanumeric messages used in POCSAG paging, These messages, each up to 25 characters in length, are saved even when power is turned off. Though these entries are alphanumeric, they can also be used with numeric only pagers provided the message is limited to the characters 0123456789?U-][and space.

5.4.1 Message 1

Range: 0-25 characters

Default: blank

5.4.2 Message 2

Range: 0-25 characters

Default: blank

5.4.3 Message 3

Range: 0-25 characters

Default: blank

5.4.4 Message 4

Range: 0-25 characters

Default: blank

5.4.5 Message 5

Range: 0-25 characters

Default: blank

5.4.6 Message 6

Range: 0-25 characters

Default: blank

5.4.7 Message 7

Range: 0-25 characters

Default: blank

5.4.8 Message 8

Range: 0-25 characters

Default: blank

5.4.9 Message 9

Range: 0-25 characters

Default: blank

5.4.10 Message 10

Range: 0-25 characters

Default: blank

5.5 SETUP MENU

5.5.1 SPEED DIAL SETUP menu

Allows you to configure the speed dial feature. The speed dial entries 0-9 correspond to the number keys 0-9. To associate a unit to a speed dial number, it must be in the user database. For each speed dial, simply locate the user in the database much in the same way as placing a call to a unit.

5.5.1.1 Speed Dial feature

As shipped, speed dial is disabled. Change this setting to ON to begin using the speed dial feature.

OFF Disable speed dial feature.

ON Enable speed dial feature.

5.5.1.2 Speed Dial 0 setting

Range: 0-14 characters

Default: blank

5.5.1.3 Speed Dial 1 setting

Range: 0-14 characters

Default: blank

5.5.1.4 Speed Dial 2 setting

Range: 0-14 characters

Default: blank

5.5.1.5 Speed Dial 3 setting

Range: 0-14 characters

Default: blank

5.5.1.6 Speed Dial 4 setting

Range: 0-14 characters

Default: blank

5.5.1.7 Speed Dial 5 setting

Range: 0-14 characters

Default: blank

5.5.1.8 Speed Dial 6 setting

Range: 0-14 characters

Default: blank

5.5.1.9 Speed Dial 7 setting

Range: 0-14 characters

Default: blank

5.5.1.10 Speed Dial 8 setting

Range: 0-14 characters

Default: blank

5.5.1.11 Speed Dial 9 setting

Range: 0-14 characters

Default: blank

5.5.2 TIME SETUP menu

Note: It is necessary to set the time only if using optional printer. In order for the correct time to be

displayed on the print logs, the time clock must be set. The unit **must remain switched-on** at all times in order to keep track of the time. The clock must be set each time the unit is powered up.

5.5.2.1 Hour setting

Set the hour of the day in 24-hour format. Enter two digits.

Range: 00-23

Default: 00

5.5.2.2 Minute setting

Set the minutes past the hour. Enter two digits.

Range: 00-59

Default: 00

5.5.3 CONSOLE SETUP menu

5.5.3.1 Call Entry Mode setting

Determines if numeric entry or alphanumeric data entry is the default mode when placing a call. The mode of entry can be toggled by pressing the <*> key during data entry.

NUMERIC Start in numeric only mode.

ALPHA Start entry in alphanumeric mode.

5.5.3.2 Fast Scrolling setting

Fast Scrolling allows for faster navigation through the menu system. The PDE can also animate the scrolling of the screen from side-to-side. This provides positive feedback in response to scrolling through menus and the ANI log. If this effect is desired, Fast Scrolling can be disabled.

OFF Animate scrolling from side to side.

ON Scroll at fast speed.

5.5.3.3 Keypad Beep option

Turning this option on causes a beep to be heard for each key press. If this option is off, only error and confirmation tones will be heard.

OFF Keypad beeps off.

ON Keypad beeps on.

5.5.3.4 Internal Speaker setting

If audio input of the PDE is connected to the radio, it's audio may be heard from the PDE speaker. If this is not desired, turn this setting off. Note that if this setting and the **Keypad** Beep option are both turned off, error and confirmation beeps can still be heard. If it is desired that absolutely no sound be heard from the console speaker, simply disconnect it from the main circuit board.

OFF Internal speaker disabled.

ON Internal speaker enabled.

5.5.3.5 Contrast setting

Allows the display contrast to be adjusted for best viewing.

LOW Low contrast setting.

HIGH High contrast setting.

5.5.3.6 Mic. Option setting

Selects which type of optional microphone accessory is attached to the PDE. This is necessary so that the PDE knows how to treat the external inputs (for example off-hook or monitor).

NONE No microphone.

GOOSENECK Gooseneck style microphone.

PADDLE Paddle style desktop microphone.

HANDSET External handset.

5.5.3.7 Printer Option

The PDE, if ordered with the printer cable option, can log the ANI traffic to a serial printer. The printer must have a print buffer and a standard RS-232 port. It must be configured for 9600 baud, 8 data bits, 1 stop bit and no parity. In order to send data to the printer, this option must be on.

OFF Do not send data to printer.

ON Send data to printer.

5.5.4 PAGER SETUP menu

Allows you define up to 10 different pager types. There are 10 pager **Profiles** consisting of the fields described below. Each profile has a factory default setting intended as examples to follow.

5.5.4.1 Profile Name field

This can be any alphanumeric string up to 14 characters. The name should be chosen based on the pager description such as 'MOT PLAN L' or 'POC ALPHA 12'. When a user is added to the database, you will be able to scroll through the 10 profile names and select the appropriate one.

5.5.4.2 Pager Type field

Select the basic pager type. You will then be prompted for more information based on the pager type. The following pager types are available:

2-Tone

5/6-Tone

Pulse Tone

Any 2 tones

DTMF

POCSAG

5.5.4.3 2-Tone type

5.5.4.3.1 Format field

Select the format matching the pager from among the following:

AVCALL/QC1 2+2

GE

REACH

MOT GENERAL

MOTOROLA A

MOTOROLA B

MOTOROLA C

MOTOROLA D

MOTOROLA E

MOTOROLA F

MOTOROLA G

MOTOROLA H

MOTOROLA J

MOTOROLA K

MOTOROLA M

MOTOROLA N

MOTOROLA P

MOTOROLA Q

MOTOROLA R

MOTOROLA S

MOTOROLA T

MOTOROLA U

MOTOROLA V

MOTOROLA W

5.5.4.3.2 1st Tone Time field

Enter the duration of the 1st tone in milliseconds. For Motorola pagers, this is typically 3 seconds (3000 milliseconds). All 4 digits must be entered.

Range: 0000 to 9999 milliseconds

5.5.4.3.3 2nd Tone Time field

Enter the duration of the 2nd tone in milliseconds. For Motorola pagers, this is typically 1 second (1000 milliseconds). All 4 digits must be entered.

Range: 0000 to 9999 milliseconds

5.5.4.4 5/6-Tone type

5.5.4.4.1 Format field

Select the format matching the pager from among the following:

EIA

EUROSIGNAL

ZVEI

DZVEI

DDZVEI

CCIR

EEA

NATEL

MODAT

5.5.4.4.2 1st Tone Time field

Enter the duration of the 1st tone in milliseconds. For EIA pagers, this is typically 33 milliseconds. All 4 digits must be entered.

Range: 0000 to 9999 milliseconds

5.5.4.4.3 Nth Tone Time field

Enter the duration of for each of the tones that follow the 1st tone in milliseconds. For EIA pagers, this is typically 33 milliseconds. All 4 digits must be entered.

Range: 0000 to 9999 milliseconds

5.5.4.5 Pulse Tone type

5.5.4.5.1 Format field

Choose the tone frequency.

2805

1500

5.5.4.5.2 Make Time field

Enter the make time (on-time) of each pulse. The 'break' time (off-time) will be 1.5 times the make time. For example, if the make time is 40 ms, the break time is 60 ms. All 4 digits must be entered.

Range: 0000 to 9999 milliseconds

5.5.4.5.3 Tail Time field

Enter the duration that tone should remain on after dialing. All 4 digits must be entered.

Range: 0000 to 9999 milliseconds

5.5.4.6 Any 2 Tones type

Note that this format is provided to support PLECTRON and other formats which do not conform to a standardized code plan.

5.5.4.6.1 1st Tone Time field

Enter the duration of the 1st tone in milliseconds. In the PLECTRON fast format, this is 750 ms. All 4 digits must be entered.

Range: 0000 to 9999 milliseconds

5.5.4.6.2 2nd Tone Time field

Enter the duration of the 2nd tone in milliseconds. In the PLECTRON fast format, this is 250 ms. All 4 digits must be entered.

Range: 0000 to 9999 milliseconds

5.5.4.7 DTMF type

5.5.4.7.1 On Time field

Enter the tone on-time. All 4 digits must be entered.

Range: 0000 to 9999 milliseconds

5.5.4.7.2 Gap Time field

Enter the gap time between tones. All 4 digits must be entered.

Range: 0000 to 9999 milliseconds

5.5.4.8 POCSAG type

5.5.4.8.1 Pager Display field

Set the display type of the pager.

NUMERIC Numeric only pager.

ALPHA Alphanumeric pager.

5.5.4.8.2 Baud Rate field

Set the baud rate of the pager.

512

1200

2400

5.5.4.8.3 Invert field

If Invert is on, the POCSAG data bits are inverted. Whether or not this needs to be done will depend on the radio and installation point. Determine this setting by experiment.

OFF Do not invert bits.

ON Invert POCSAG data bits.

5.5.4.8.4 Function Bits field

The way a pager handles the function bits depends on the specific pager. In some instances, they control which sound the pager makes when it goes off.

00

01

10

11

5.5.4.9 Pager Profiles and Defaults

The following shows the factory default pager profile settings that allow the PDE to function 'out of the box'. Please refer to section 4.2.1 for more information.

5.5.4.9.1 Profile 1

The factory default settings for this profile are as follows:

Profile Name: PULSE 2805
Pager Type: Pulse Tone
Format: 2805
Make Time: 0040
Tail Time: 1000

5.5.4.9.2 Profile 2

The factory default settings for this profile are as follows:

Profile Name: REACH 2-TONE
Pager Type: 2-Tone
Format: REACH
1st Tone Time: 2000
2nd Tone Time: 0700

5.5.4.9.3 Profile 3

The factory default settings for this profile are as follows:

Profile Name: MOT GENERAL
Pager Type: 2-Tone
Format: MOT GENERAL
1st Tone Time: 1000
2nd Tone Time: 3000

5.5.4.9.4 Profile 4

The factory default settings for this profile are as follows:

Profile Name: DTMF
Pager Type: DTMF
On Time: 0050
Off Time: 0050

5.5.4.9.5 Profile 5

The factory default settings for this profile are as follows:

Profile Name: EIA 5-TONE
Pager Type: 5/6-Tone
Format: EIA
1st Tone Time: 0033
Nth Tone Time: 0033

5.5.4.9.6 Profile 6

The factory default settings for this profile are as follows:

Profile Name: EUROSIGNAL
Pager Type: 5/6-Tone
Format: EUROSIGNAL
1st Tone Time: 0100
Nth Tone Time: 0100

5.5.4.9.7 Profile 7

The factory default settings for this profile are as follows:

Profile Name: POCSAG-NUMERIC
Pager Type: POCSAG
Pager Display: NUMERIC
Baud Rate: 1200
Invert: OFF

Function Bits: 00

5.5.4.9.8 Profile 8

The factory default settings for this profile are as follows:

Profile Name: QUICK CALL 1
Pager Type: 2-Tone
Format: AVCALL/QC1 2+2
1st Tone Time: 1000
2nd Tone Time: 1000

5.5.4.9.9 Profile 9

The factory default settings for this profile are as follows:

Profile Name: GE 2-TONE
Pager Type: 2-Tone
Format: GE
1st Tone Time: 1000
2nd Tone Time: 1500

5.5.4.9.10 Profile 10

The factory default settings for this profile are as follows:

Profile Name: PLECTRON-FAST
Pager Type: Any 2-Tones
1st Tone Time: 0750
2nd Tone Time: 0250

5.5.5 RADIO SETUP menu

5.5.5.1 Keyup Delay setting

This sets the *Key-Up Delay*, also known as *Front Porch Time*. This is the amount of time the PDE will wait after asserting PTT before sending tones over the air. This time allows for delays introduced by repeaters and decoding of squelch control signals such as CTCSS.

Range: 01 to 99 * 100 milliseconds

Default: 04 * 100 milliseconds

5.5.5.2 COR Polarity setting

Note: If not using the **Busy Lockout** feature, you may leave the COR input unconnected.

The COR input is used in conjunction with the **Busy Lockout** feature. Change this setting to match the state of the COR (carrier detect) input when the radio channel is busy.

LOW Channel is busy when COR is 0V.

HIGH Channel is busy when COR is 5V.

5.5.5.3 Busy Lockout feature

This feature prevents the PDE from transmitting on a busy channel. If this feature is ON, the unit will not transmit when the COR input is in the active state. When making a call and the channel is busy, the PDE will wait until the channel is clear and then transmit. New calls cannot be placed until the pending call is completed or canceled. When this option is OFF, the unit will transmit regardless of the state of the COR input.

OFF Transmit regardless of COR input.

ON Do not transmit when channel busy.

5.5.6 SECURITY SETUP menu

5.5.6.1 Security setting

Allows the security option to be turned on and off. If turned off, the **LOCK/UNLOCK** menus will not appear.

OFF Disable security feature.

ON Enable security feature.

5.5.6.2 Password setting

Sets the password required to UNLOCK the menu system when the Security is turned on. Must be 4 numeric digits.

Range: 4 digits

Default: 0000

5.5.7 UTILITIES menu

5.5.7.1 Reset Defaults

This will reset all the parameters listed above to the factory default settings. The contents of the user database will not be affected.

5.5.7.2 Clear Database

This will completely clear the user database. The contents of the other parameters listed above will not be affected.

5.5.7.3 Factory Debug

This is used by the factory for product testing. **Do not select this function unless directed to do so by Midian Technical Support.**

6 APPENDIX

6.1 SYSTEM ERROR MESSAGES

CHANNEL BUSY

Reason: An attempt was made to transmit or make a call on a busy channel with busy lockout enabled.

Solution: Wait until the channel is clear before transmitting.

DATABASE EMPTY

Reason: An attempt was made to edit or delete a user

when the database was empty.

Solution: These functions do not apply when the database is empty.

DATABASE FULL

Reason: An attempt was made to add a user to the database and there is no more room. The maximum number of user aliases of 155 cannot be exceeded.

Solution: Remove any old user names that are no longer in service. If this is not possible, contact Midian for possible alternative products.

DATABASE ERROR

Reason: One or more entries in the user database has been corrupted. This can happen if power is lost at the exact time the database is being updated. Any corrupted records will be blanked-out and must be re-entered.

Solution: Cycle power to the unit. This should clear the error. If the error message continues to come up, contact Midian technical support.

DUPLICATE NAME

Reason: An attempt was made to add a user name to the database which is already in the database. Each user name in the database must be unique.

Solution: Choose a unique user name for each user. If it is necessary to edit the user record, use the edit menu.

EE CHKSUM ERR

Reason: The configuration settings stored in EEPROM have been corrupted. This can happen if power is lost at the exact time a parameter is being updated. All configuration settings will be set back to defaults. The user database should not be affected.

Solution: Cycle power to the unit. This should clear the error. If the error message continues to come up, contact Midian technical support.

EE WRITE FAIL

Reason: The EEPROM chip or connections to it have failed.

Solution: Contact Midian for instructions on getting the unit repaired.

ENCODER TIMEOUT

Reason: The PDE expects a page to be completed within 20 seconds and this time has been exceeded. This can happen in the if the total time of the key-up delay and encoding exceeds 20 seconds. This is not likely to happen unless non-standard encode timings and encode lengths are used. It is also possible that there could be a hardware failure.

Solution: If total time of the key-up delay and signaling tones exceeds 20 seconds, simply press <SEND> to clear the message from the display. The page will still be sent. In the event of a hardware failure, contact Midian technical support to determine if that is the cause.

INVALID CAP CODE

Reason: The number of digits in the CAP code are incorrect for the pager format being used.

Solution: Enter the correct number of digits. Most built-in 2-tone formats require exactly 3 digits. POCSAG requires 7 digits, and 'any 2-tone' requires 10 digits. The other formats can accept 1-10 digits.

NOT FOUND

Reason: There is no entry in the user database that matches the data entered.

Solution: When selecting a user to call, the name or the CAP code can be entered in whole or in part. When entering a partial name or CAP code, press the right <SCROLL> button to search the database for the first partial match. Press <SEND> only if the whole CAP code or name has been entered. There may be no entry in the database that matches in whole or in part. In that case, the user must be added to the database.

NOT NUMERIC MESSAGE

Reason: You are trying to send a message containing non-numeric characters (other than those below) to a POCSAG pager designated as being numeric only.

Solution: Restrict your entry to POCSAG 'numeric' characters only. These are 0123456789?U-][and space.

PROFILE IN USE

Reason: You have selected a pager profile to edit that is associated with a user in the database. This message is provided as a warning so that you do not change a user's profile unintentionally.

Solution: You may either press <#> to cancel your selection, or press <SEND> to proceed to view or edit the selected profile. Changing an already assigned profile may cause problems if the profile changes, say, from POCSAG to 2-Tone because 2-Tone users cannot have 7-digit CAP codes! Please keep this in mind if you proceed to do this.

SPEED DIAL EMPTY

Reason: You have pressed a speed dial number, but there is no user associated with it. The user may have been deleted, or no association was ever made.

Solution: Go to speed dial setup and associate a user in the database to the speed dial number.

6.2 TONE CHARTS

Below are tone charts for some selected formats provided for your convenience. For an extensive collection of full-size tone charts, please view our on-line tone charts at:

http://www.midians.com/pdf/tone_signaling.pdf

6.2.1 AVCALL CAP code entry

AVCALL is not like the other tone formats in that the CAP code consists of alphabetic characters instead of numbers. To overcome this, AVCALL CAP codes must be entered as 2 digits per letter. A total of 8 digits must be entered. Refer to the following conversion chart.

AVCALL 2+2		
PDE-1 CODE	**AVCALL CODE**	**TONE FREQ**
00	A	0312.6
01	B	0346.7
02	C	0384.6
03	D	0426.6
04	E	0473.2
05	F	0524.8
06	G	0582.1
07	H	0645.7
08	J	0716.1
09	K	0794.3
10	L	0881.0
11	M	0977.2
12	P	1083.9
13	Q	1202.3
14	R	1333.5
15	S	1479.1

6.2.2 QUICK CALL 1 CAP code entry

Quick Call 1 (2+2) is not like the other tone formats in that the CAP code consists of alphabetic characters instead of numbers. To overcome this, Quick Call 1 CAP codes must be entered as 2 digits per code. A total of 8 digits must be entered. Refer to the following conversion chart

MOTOROLA QUICK CALL 1 TWO PLUS TWO (2+2) OR CODE TYPE "Y"		
PDE-1 CODE	**QC1 CODE**	**TONE FREQ**
SERIES A		
16	DA	0398.1
17	EA	0441.6
18	FA	0489.8
19	GA	0543.3
20	HA	0602.6
21	JA	0668.3
22	KA	0741.3
23	LA	0822.2
24	MA	0912.0
25	CA	0358.9
26	NA	1011.6
27	PA	1122.1
B SERIES		
28	DB	0412.1
29	EB	0457.1
30	FB	0507.0
31	GB	0562.3
32	HB	0623.7
33	JB	0691.8
34	KB	0767.4
35	LB	0851.1
36	MB	0944.1
37	CB	0371.5
38	NB	1047.1
39	PB	1161.4
Z SERIES		
40	DZ	0384.6
41	EZ	0426.6
42	FZ	0473.2
43	GZ	0524.8
44	HZ	0582.1
45	JZ	0645.7
46	KZ	0716.7
47	LZ	0794.3
48	MZ	0881.0
49	CZ	0346.7
50	NZ	0977.2
51	PZ	1084.0

6.2.3 PLECTRON Chart

The PLECTRON format does not use CAP codes. Instead, the frequencies of the tones must be entered directly. Use the 'Any 2-Tones' format for PLECTRON.

PLECTRON

PLECTRON FORMAT TONES									
282.2	366.0	474.8	615.8	799.0	1036	1344	1743	2260	2932
294.7	382.3	495.8	643.0	834.0	1082	1403	1820	2361	3062
307.8	399.2	517.8	672.0	871.0	1130	1465	1901	2465	3197
321.4	416.9	540.7	701.0	910.0	1180	1530	1985	2575	3339
335.6	435.3	564.7	732.0	950.0	1232	1598	2073	2688	3487
350.5	454.6	589.7	765.0	992.0	1287	1669	2164	2807	
PLECTRON DOES NOT EMPLOY CODE GROUPS - RANDOM SELECTION ONLY									

6.2.4 Motorola 2-tone Charts

The following Motorola 2-tone information is provided for your convenience.

MOTOROLA GENERAL ENCODING PLAN TABLE 1		
FIRST DIGIT OF PAGER CODE	GROUP FROM WHICH TONE A IS SELECTED	GROUP FROM WHICH TONE B IS SELECTED
1	1	1
2	2	2
3	1	2
4	4	4
5	5	5
6	2	1
7	4	5
8	5	4
9	2	4
0	4	2
A	3	3

MOTOROLA TABLE 3 EXTENDED CODE PLAN

FIRST DIGIT	CAP CODE																			
	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	S	T	U	V	W	Y
1	11	11	11	11	11	11	11	11	11	11	23	23	23	24	24	25	34	34	35	46	AA
2	22	22	22	22	13	13	13	14	14	15	22	22	22	22	22	22	43	43	53	64	BB
3	33	12	12	12	33	33	33	41	41	51	33	33	33	42	42	52	33	33	33	56	ZZ
4	12	44	15	21	44	31	31	44	44	16	44	32	32	44	44	26	44	44	36	44	AB
5	13	14	55	16	31	55	16	55	16	55	32	55	26	55	26	55	55	36	55	55	AZ
6	21	21	21	66	14	15	66	15	66	66	24	25	66	25	66	66	35	66	66	66	BA
7	31	41	51	61	41	51	61	45	61	61	42	52	62	45	62	62	45	63	63	45	ZA
8	23	24	25	26	34	35	36	54	46	56	34	35	36	54	46	56	54	46	56	54	BZ
9	32	42	52	62	43	53	63	51	64	65	43	53	63	52	64	65	53	64	65	65	ZB
OPTIONAL DIAGONAL TONES: 569.1, 979.9 Hz																					

MOTOROLA QUICK CALL 2 ONE PLUS ONE

TONE NO.	REED GROUP 1		REED GROUP 2		REED GROUP 3		REED GROUP 4		REED GROUP 5		REED GROUP 6		REED GROUP 10		REED GROUP 11	
	Reed Code	Freq Hz	Reed Code	Freq Hz	Reed Code	Freq Hz	Reed Code	Freq Hz	Reed Code	Freq Hz	Reed Code	Freq Hz	Reed Code	Freq Hz	Reed Code	Freq Hz
1	111	349.0	121	600.9	138	288.5	141	339.6	151	584.8	191	1153.4	171	1513.5	201	1989.0
2	112	368.5	122	634.5	108	296.5	142	358.6	152	617.4	192	1185.2	172	1555.2	202	2043.8
3	113	389.0	123	669.9	139	304.7	143	378.6	153	651.9	193	1217.8	173	1598.0	203	2094.5
4	114	410.8	124	707.3	109	313.0	144	399.8	154	688.3	194	1251.4	174	1642.0	204	2155.6
5	115	433.7	125	746.8	160	953.7	145	422.1	155	726.8	195	1286.8	175	1687.2	205	2212.2
6	116	457.9	126	788.5	130	979.9	146	445.7	156	767.4	196	1321.2	176	1733.7	206	2271.7
7	117	483.5	127	832.5	161	1006.9	147	470.5	157	810.2	197	1357.6	177	1781.5	207	2334.6
8	118	510.5	128	879.0	131	1034.7	148	496.8	158	855.5	198	1395.0	178	1830.5	208	2401.0
9	119	539.0	129	928.1	162	1063.2	149	524.6	159	903.2	199	1433.4	179	1881.0	209	2468.2
0	110	330.5	120	569.1	189	1092.4	140	321.7	160	553.9	190	1122.5	170	1472.9	200	1930.2

6.2.5 GE 2-tone Charts

The following GE 2-tone information is provided for your convenience.

GE TYPE 99 TABLE 1			
GROUP	A	B	C
TONE #	FREQ	FREQ	FREQ
1	592.5	607.5	712.5
2	757.5	787.5	772.5
3	802.5	832.5	817.5
4	847.5	877.5	862.5
5	892.5	922.5	907.5
6	937.5	967.5	952.5
7	547.5	517.5	532.5
8	727.5	562.5	577.5
9	637.5	697.5	622.5
0	682.5	652.5	667.5
DIA	742.5 Hz		

GE Type 99 Table 2		
100's DIGIT	TONE REED GROUPS FOR	
	1ST TONE	2ND TONE
0	A	A
1	B	A
2	B	B
3	A	B
4	C	C
5	C	A
6	C	B
7	A	C
8	B	C

6.2.6 REACH 2-tone Charts

The following REACH 2-tone information is provided for your convenience.

REACH TWO-TONE SEQUENTIAL – FAST OR SLOW		
1ST DIGIT OF CODE	GROUP FOR 1ST TONE (2ND DIGIT)	GROUP FOR 2ND TONE (3RD DIGIT)
1	A	C
*2	C	A
3	B	D
*4	D	B
5	A	D
*6	D	A
7	A	E
*8	E	A
9	B	E
*0	E	B

REACH TWO TONE & SINGLE TONE PAGING FREQUENCIES													
TWO TONE & SINGLE TONE													
TONE #	GROUP A		GROUP B		GROUP C		GROUP D		GROUP E		SINGLE TONE ONLY		
	Chnl	Freq	Chnl	Freq	Chnl	Freq	Chnl	Freq	Chnl	Freq	Chnl	Freq	Chnl	Freq
1	11	2704	21	1912	26	1608	36	1137	46	804	01	3824	56	568
2	12	2612	22	1847	27	1553	37	1093	47	776	02	3694	57	549
3	13	2523	23	1784	28	1500	38	1061	48	750	03	3568	58	530
4	14	2437	24	1723	29	1449	39	1025	49	725	04	3446	59	512
5	15	2354	25	1664	30	1400	40	990	50	700	05	3329	60	495
6	16	2274	26	1606	31	1352	41	956	51	676	06	3215		
7	17	2196	27	1553	32	1306	42	923	52	653	07	3106		
8	18	2121	28	1500	33	1261	43	892	53	631	08	3000		
9	19	2049	29	1449	34	1219	44	862	54	609	09	2898		
0	20	1980	30	1400	35	1177	45	832	55	588	10	2799		

6.2.7 5/6-tone Chart

The following 5/6-tone information is provided for your convenience.

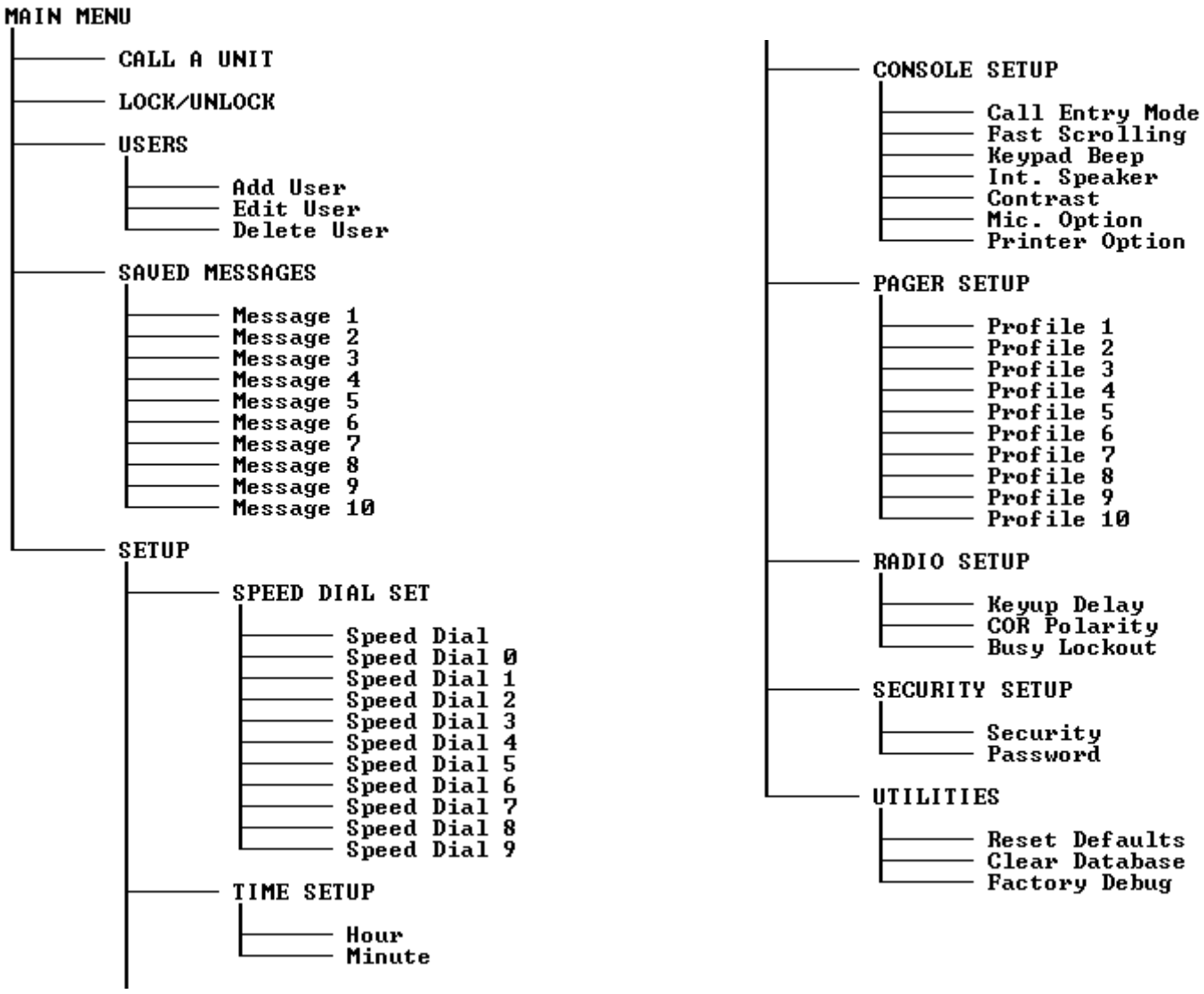
SEQUENTIAL SINGLE FREQUENCY CODES & TIMINGS															
TONE NUMBER	CODE DIGIT	EUROPEAN TONE FREQUENCIES IN HZ												MOTOROLA	
		ZVEI1	ZVEI2	ZVEI3	PZVEI	DZVEI	PDZVEI	CCIR1	CCIR2	PCCIR	EEA	EURO SIGNAL	NATEL	EIA	MODAT
TONE 0	0	2400	2400	2200	2400	2200	2200	1981	1981	1981	1981	979.8	1633	600	637.5
TONE 1	1	1060	1060	970	1060	970	970	1124	1124	1124	1124	903.1	631	741	787.5
TONE 2	2	1160	1160	1060	1160	1060	1060	1197	1197	1197	1197	832.5	697	882	937.5
TONE 3	3	1270	1270	1160	1270	1160	1160	1275	1275	1275	1275	767.4	770	1023	1087.5
TONE 4	4	1400	1400	1270	1400	1270	1270	1358	1358	1358	1358	707.4	852	1164	1237.5
TONE 5	5	1530	1530	1400	1530	1400	1400	1446	1446	1446	1446	652.0	941	1305	1387.5
TONE 6	6	1670	1670	1530	1670	1530	1530	1540	1540	1540	1540	601.0	1040	1446	1537.5
TONE 7	7	1830	1830	1670	1830	1670	1670	1640	1640	1640	1640	554.0	1209	1587	1687.5
TONE 8	8	2000	2000	1830	2000	1830	1830	1747	1747	1747	1747	510.7	1336	1728	1837.5
TONE 9	9	2200	2200	2000	2200	2000	2000	1860	1860	1860	1860	470.8	1477	1869	1987.5
GROUP TONE	A	2800	885	885	970	825/885	825	2400	2400	1050	1055	---	1995	2151	
	B	810	810		810	740	886	930	930	930	930		571	2433	
RESET TONE	C	970	740		2800	2600	2600	2247	2247	2400	2400		2205	2010	
	D	885	680		885	885	856	991	991	991	991		2437	2292	
REPEAT TONE	E	2600	970	2400	2600	2400	2400	2110	2110	2110	2110	1062.9	1805	459	487.5
	F	680	2600		680	680		1055	1055		2247		2694	1091	
TONE WIDTH (MS)		70±15	70±15	70±15	70±15	70±15	70±15	100±10	70±15	100±10	40±4	100	70	33±.5	40±5
SEQ LENGTH (MS)		350	350	350	350	350	350	500	350	500	200	600-700	350	165	280
MAX INTERTONE TIME (MS)		15	15	15	15	15	15	7.5	7.5	7.5	4			0	
MIN GAP BEFORE/ BETWEEN SEQ (MS)		140	140	140	140	140	140	290	290	290	100			33	
ENCODER TOLERANCE		±1.5%	±1.5%	±1.5%	±1.5%	±1.5%	±1.5%	±8Hz	±8Hz	±8Hz	±1%			±.1%	
MUST DECODE BW		±1.5%	±1.5%	±1.5%	±1.5%	±1.5%	±1.5%	±1%	±1%	±1%	±1%			±16Hz	
MUST REJECT BW		±4.5%	±4.5%	±4.5%	±4.5%	±4.5%	±4.5%	±3%	±3%	±3%	±3%			NS	
CAUTION: The A,B,C,D,E,F tones above have been modified by some manufacturers for competitive or system needs. DZVEI is 825 Hz for the Group Tone or "A" Tone, however, several manufacturers use 885 Hz. The 0-9 tones, group tones, & repeat tones are standards.															
EEA	Electronic Engineering Association, United Kingdom, Five Tone.														
CCIR	Comite Consultatif International de Radio, Five Tone. Can also employ 40ms tones.														
ZVEI/DZVEI/DDZVEI	Zentralverband der Electrotechnische Industrie, West Germany, Five Tone. Depressed ZVEI and Double Depressed ZVEI: Modified forms of ZVEI with lower frequencies due to use in narrow band systems.														
NATEL	Scandinavian National Telephone														
EUROSIGNAL	Six Tone Sequential High Power AM paging for CEPT countries, Six to Seven Tone.														
EIA	Electronics Industries Association, United States. Motorola Metropage. Can use 690 ms preamble plus 45 ms gap followed by 5 tones for battery save.														
MODAT	Motorola Seven Tone ANI Status System.														
REACH	Eleventh root of two spacing. Two to Five Tone Selective call, ANI, Status. Digit sequence is High, Low, High, Low, High: first digit High, second Low, third High, etc.														

6.2.8 Pager Timing Charts

The following timing information is provided for your convenience.

ONE, TWO & TWO TONE TIMING SEQUENCE				
FORMAT	CALL SEQUENCE	1ST TONE	GAP	2ND TONE
BURST TONE	Open Squelch	100 – 500 ms		
MOTOROLA 2 + 2 QUICK CALL 1 SERIES Y	Individual Call	1 sec	200 ms	1 sec
	Group Call	4 sec of tone 2 & 3		
MOTOROLA 1 + 1 QUICK CALL 2	Individual Call Tone & Voice	1 sec	0	3 sec
	Group Call	0	0	8 sec
	Tone Only	.4 sec	0	.8 sec
	Tone Only Battery Save	2.7 sec	0	.8 sec
REACH TWO TONE	Reach Slow	.2 sec	25 ms	.7 sec
	Reach Fast	150 ms	25 ms	150 ms
	Reach Group Call Two Tone	.5 sec	0	0
REACH SINGLE TONE	Reach Single Tone	1.5 sec	0	0
	Reach Single Tone Battery Save	3.5 sec	0	0
PLECTRON	Single Tone	3 sec		
	Plectron Fast Duotone	.75 sec	0	.25 sec
	Plectron Slow Duotone	3 sec	0	.25 sec
AVCALL 2 + 2	Unit Call	1.25 sec	.2 sec	1 sec
GENERAL ELECTRIC	General Electric Type 99	1 sec	0	1.5 sec
	Four Tone GE Trunk	40 ms each, no gap 1st tone is collect tone and is 90 ms times number of channels		
NEC	Group Call			
A	6 sec	1 sec	.25 sec	3 sec
B	6 sec	1 sec	0	3 sec
C	4 sec	1 sec	0	1 sec
D	3 sec	.4 sec	0	.4 sec
L	3 sec	.5 sec	0	.5 sec
M	4 sec	.4 sec	0	.8 sec

6.3 MENU SYSTEM MAP



MIDIAN ELECTRONICS, INC.	PDE-1	REV C-2	DOCUMENT NAME CP
DATE:2012-05-11 DWN BY:DML APPR	SCHEMATIC	SHEET 1 of 1	PROJECT NUMBER 7749
DESIGN:CJS REV:2014-03-27	COPYRIGHT © 2014		

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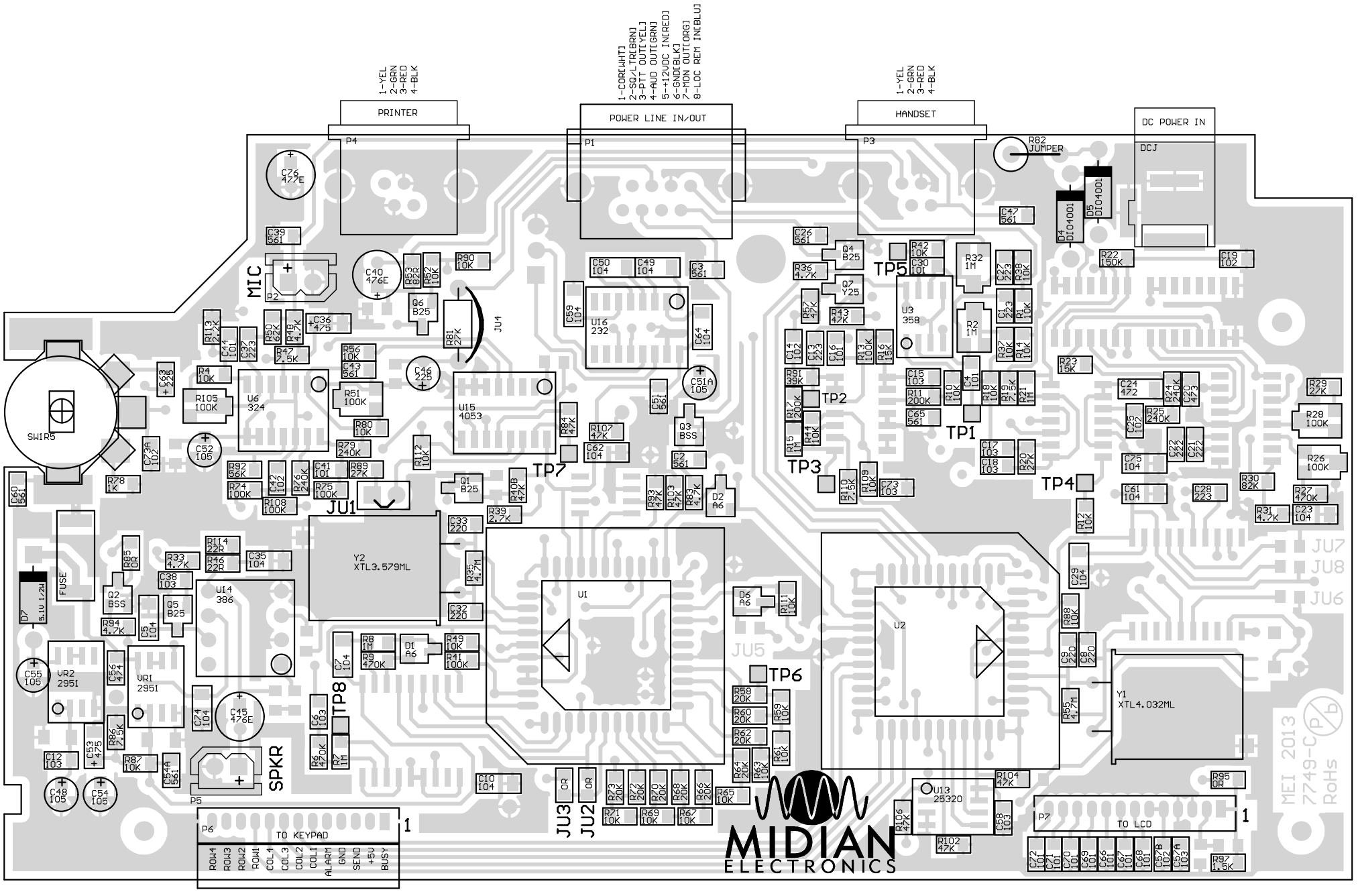

* = NOT INSTALLED

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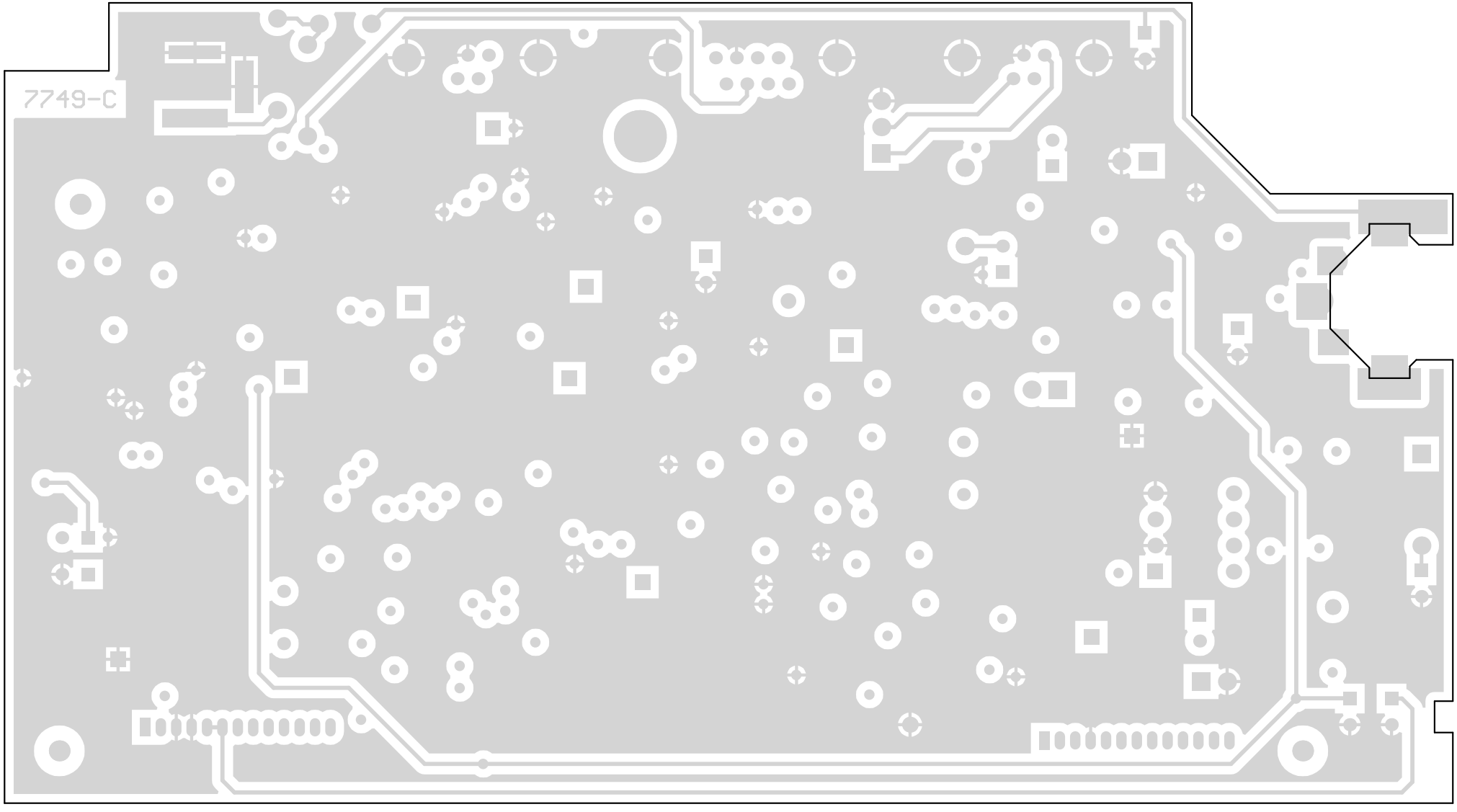

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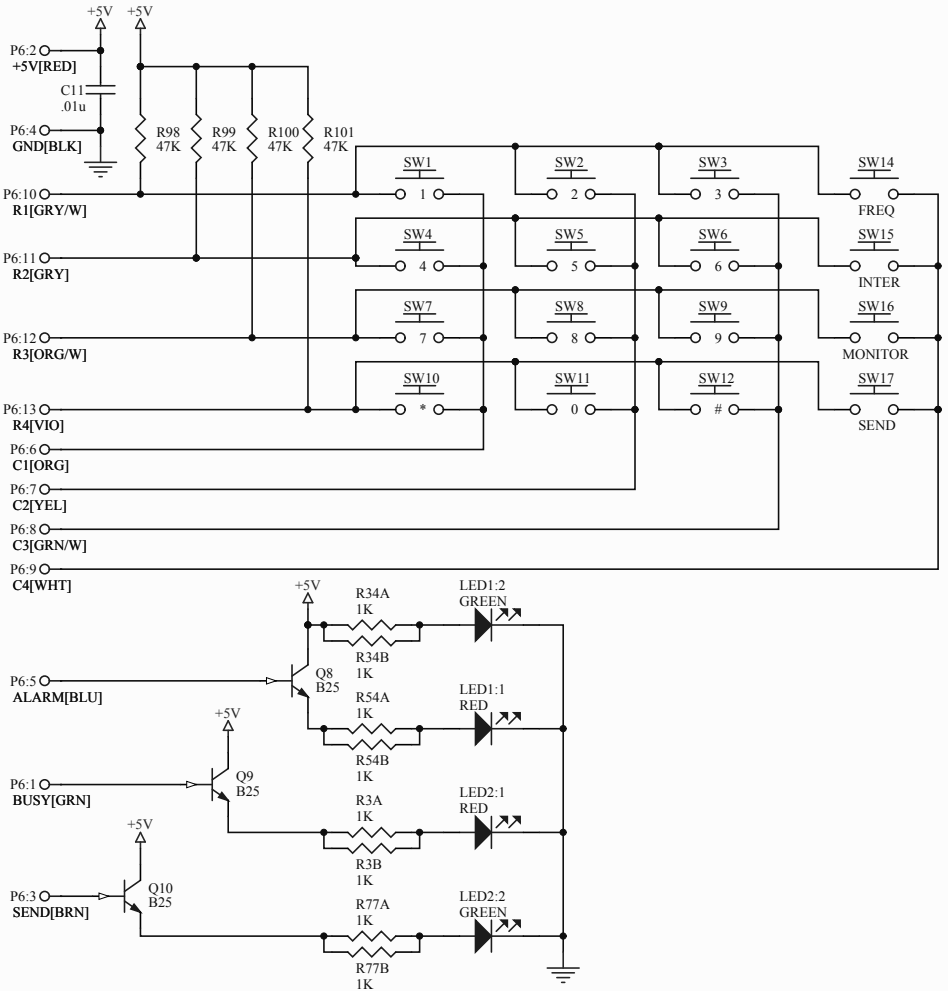

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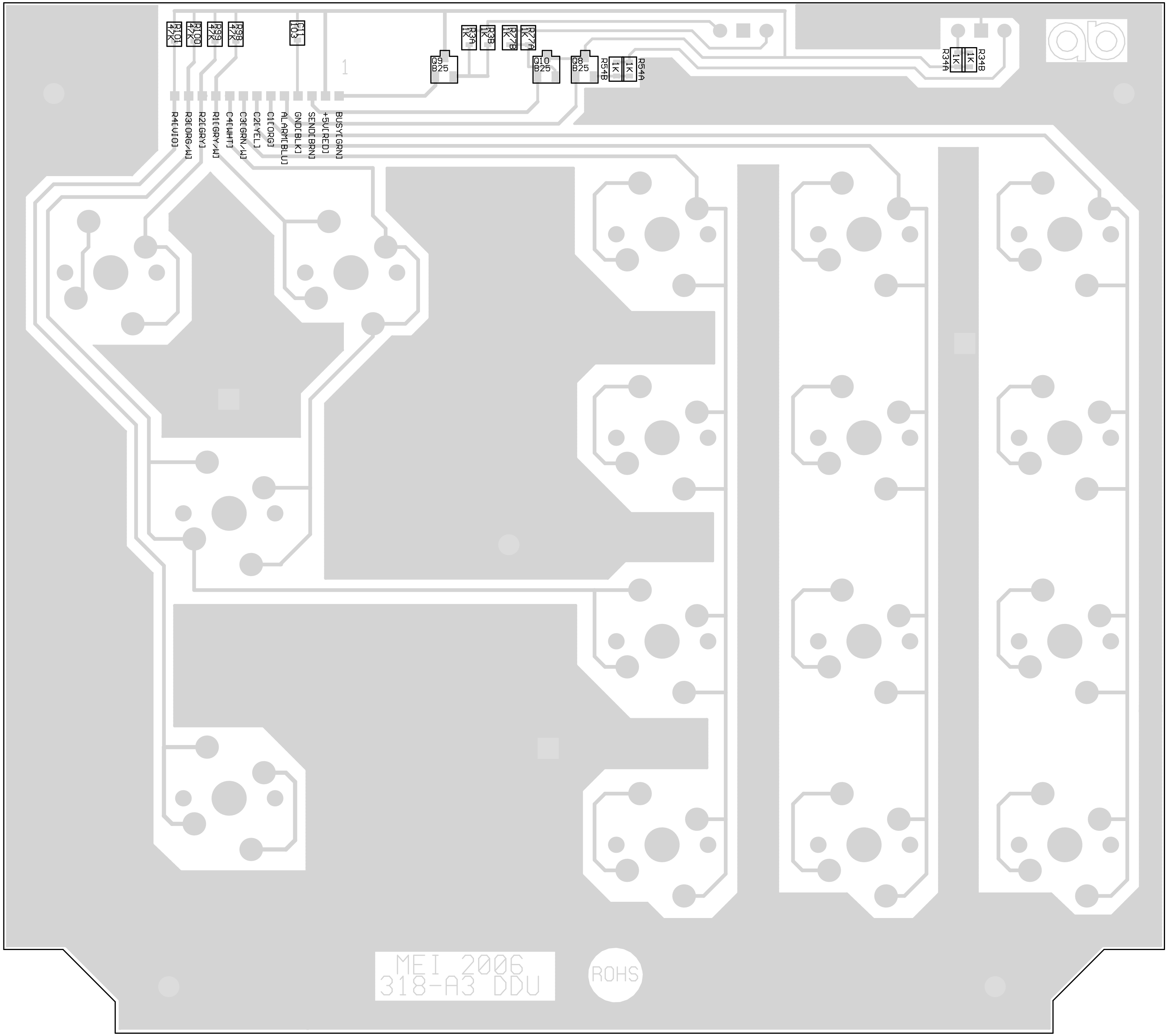

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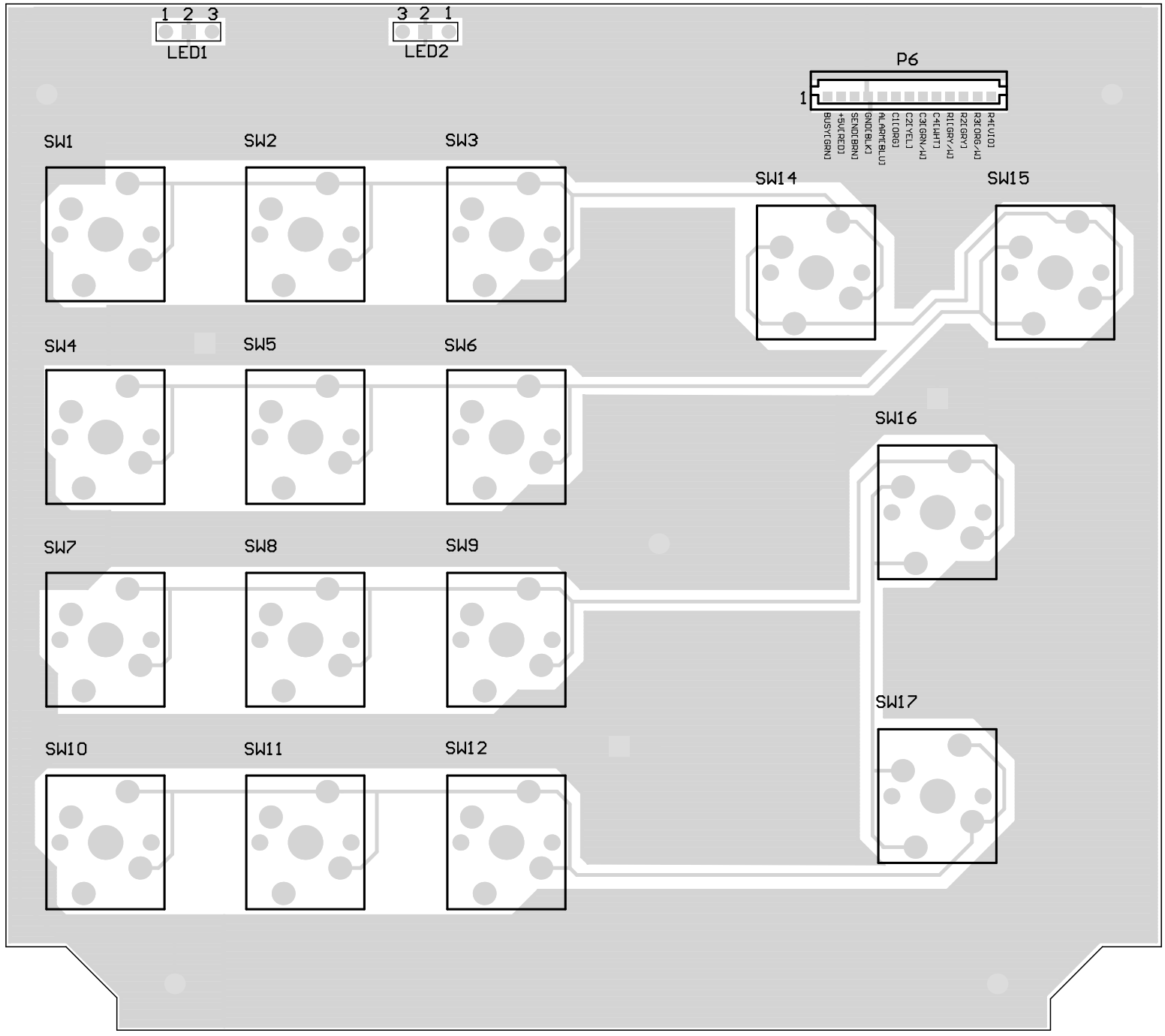

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