



Model

DDU-100/200

DISPATCH DISPLAY UNIT

INSTRUCTION MANUAL

Model Features

- 10 entry ANI recall memory
- 137 entry alias database
- Auto-mute leading ANI
- Alternate function as a repeater access controller
- Programmable encode/decode format
- Supports DTMF and several 5-tone formats
- Easy to read backlit LCD display
- Serial printer logging (w/optional cable)

MANUAL REVISION: 2006.02.22

COVERS PRODUCT SOFTWARE VERSION(S):

1.1 _____

WITH ENCODER/DECODER VERSION(S):

1.7 _____

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DDU-100/200

MIDIAN ELECTRONICS, INC.
To Order: 1-800-MIDIANS

2302 East 22nd Street
Telephone: (520) 884-7981

Tucson, Arizona 85713
Fax: (520) 884-0422

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) > 10k Ω

Outputs

Output Level (TX, unloaded) 150-2500 mV p-p
Output Impedance (TX) 27k Ω with JU4 cut
Speaker Audio Output 1 W into 8 Ω

Mechanical

Dimensions: 2 $\frac{7}{8}$ "H x 6 $\frac{1}{2}$ "W x 8 $\frac{3}{4}$ "L
Operating Temp 0° to 50° C

Encode/Decode Formats

DTMF, CCIR, EEA, EIA, ZVEI, DZVEI, DDZVEI, NATEL, and MODAT.

Other

Max ANI Length 8 digits
ANI Recall Stack Size 10
Alias Database Size 137

WARRANTY

Midian Electronics, Inc., warrants this product to be free from defects in material and workmanship for two years from date of shipment. If such malfunction occurs, it will be repaired or replaced (at our option) without charge for materials or labor if returned to the factory. This warranty does not apply to any parts damaged due to improper use--including accident, neglect, unreasonable use, and improper installation--or to unauthorized alterations or modifications of the equipment. It does not extend to damage incurred by natural causes such as lightning, fire, floods, or other such catastrophes, nor to damage caused by environmental extremes, such as power surges and/or transients. It does not extend to microprocessors, if it is determined by Midian that the failure of a micro is due to static damage, application of improper voltages to the unit, or other problems not related to circuit design. In such case or in the case of a desire to update the micro to a different version of software, such request must be specified in writing, and there will be a charge agreed upon by both parties.

This product is warranted to meet published specifications and to operate as specified only when properly installed in radio equipment which complies with U.S. FCC specifications and the applicable radio manufacturer's specifications. Midian Electronics is not responsible for any operational problems caused by system design, outside interference, or improper installation.

Equipment for repair can be returned to the factory without prior written authorization. A brief letter describing the nature of the defect should be included with the merchandise. Repair by other than Midian Electronics, Inc., will void this warranty. In-warranty merchandise must be shipped, freight prepaid, to Midian Electronics. Midian Electronics will return, freight prepaid via UPS ground, the repaired or replaced equipment to purchaser, within the United States. Out-of-warranty repairs will be billed at the rate of \$60 per hour, plus replacement parts.

This warranty applies to the original purchaser of the equipment only. Midian Electronics is not liable under this warranty, or any implied warranty, for loss of use or for other consequential loss or damage experienced by the purchaser. Some states do not permit the exclusion or limitation of implied warranties or consequential damages. This warranty provides special legal rights, and the purchaser may have other rights that vary from state to state.

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SCHEMATIC		
PICTORIAL		

2 OVERVIEW

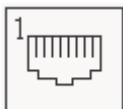
The DDU provides the optimal ANI display decoder solution for small and medium sized radio systems such as those used by taxi fleets, police departments, construction crews, etc. It offers many features normally found only in large and expensive Computer Aided Dispatch (CAD) systems in one compact desktop unit.

It can encode and decode most popular tone signaling formats. The last 10 ANI's received can be reviewed at any time. It can store up to 137 aliases in its user database. The user friendly menu system makes it as easy to use as a cell phone. Additional features include status display and the ability to automatically mute incoming leading ANI's

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 DDU 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 800mA. Also, be certain that positive is connected to the inside ring.

GROUND (P1-6) [Black]

Connect to radio ground.

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

Connect to a point in the radio where receive audio is present at a constant level. If using PL or CTCSS, be sure to connect to a point after the CTCSS high pass filter. If using the Squelch Output of the DDU, be sure the RX audio point is not muted when the radio is squelched.

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

Connect to the mic-hi input of the radio. The output impedance of the DDU can be adjusted if necessary by replacing leaded resistor R81 with an appropriate value.

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.

This output may also be assigned to be the repeater access control output. See **REPEATER SETUP** for more information.

COR INPUT (P1-1) [Gray]

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.

Note that it is required that the COR Input be in the active state in order to decode all formats except DTMF. If COR is not to be connected, make sure it is programmed to be active HIGH. A COR connection is required in order to use busy lockout, auto ANI mute, and repeater access control features.

MONITOR OUTPUT (P1-7) [Orange]

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

This output may also be assigned to be the repeater access control output. See **REPEATER SETUP** for more information.

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

This wire may be either a **Squelch Output** or a **Trunking Delay** (LTR) input, but not both. To use as a squelch output, install jumper R85 and make sure jumper JU5 is not installed. To use as a trunking delay input, remove R85 and install JU5.

When used as a Squelch Output, connect to a point in the radio which will mute the speaker when brought to ground (or left floating). Program the appropriate polarity in the **RADIO SETUP** menu.

When used as an LTR Trunking Delay Input, connect to a point in the radio which changes state between 0 and 5 VDC when a channel has been acquired on the LTR trunking system. The active (channel acquired)

state of this input is programmable in the **RADIO SETUP** menu.

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: R2 and R32 near connector P3, R51 near IC U6, and R105 near the volume control.

INPUT LEVEL (when using decode feature)

Use a service monitor to generate a 1000 Hz test tone at 2/3 of maximum system modulation (typically 3.3 kHz). Measure the voltage appearing at TP1 and adjust R2 such that TP1 is at 250mV RMS.

OUTPUT LEVEL (when using encode feature)

Use a service monitor to measure the modulation level generated by the DDU. Cause the DDU to generate tones by typing in a few digits 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.

Tip: EIA format tone 3 is 1023 Hz. Programming the encode format to EIA and setting encode time to 2000 milliseconds provides a handy test tone. Simply enter the digit 3 and press <SEND> for 2 seconds of test tone.

SPEAKER PRE-AMP

Though the DDU 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.

3.4 CONFIGURATION SETTINGS

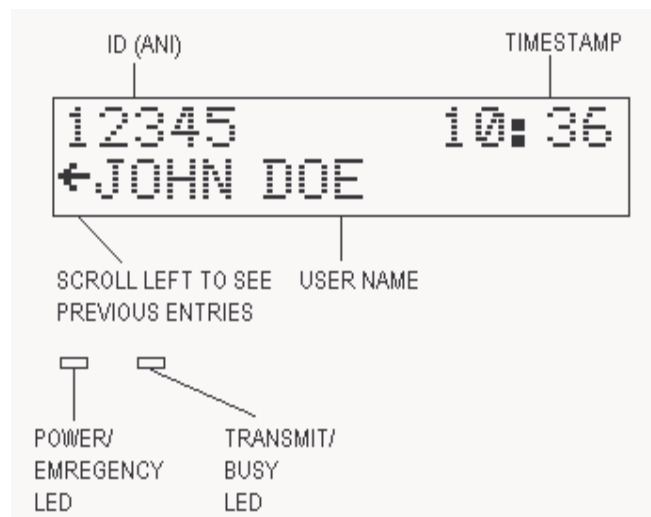
Once adjustments have been made, it will be necessary to configure the DDU to meet the system requirements. This is done via **Menu Mode**. The most

crucial settings include **Decode Format** and **Encode Format** (if using encode feature). Refer to **ENC/DEC SETUP** menu item. Pay close attention to **Encode Time 1 & 2** and **Decode Time** as well.

It is also important to program **COR Polarity** to match that of the radio. If this is not set properly, the DDU will not decode some of the formats.

Be sure to set the time of day via **TIME SETUP** once the DDU is operating as desired. Once the time is set, be sure to leave the unit on at all times or else the time will have to be reset. The time can only be set to the nearest minute. Seconds are kept track of internally and start running the instant the unit is turned-on. It is a good idea to check the time clock monthly as crystal and temperature variances affect the accuracy.

4 BASIC OPERATION



4.1 DISPLAY MODE

The DDU operates either in **Display Mode** or **Menu Mode**. In display mode, the DDU normally displays the last ANI received.

4.1.1 Reading the Display

ID (ANI) – This is the numeric ID (or ANI) of the user who last transmitted on the channel. When the **Status Feature** is enabled, this area will alternate between displaying the ANI and the status message every 2 seconds.

TIMESTAMP – This is the time of day that the last ANI was received. The timestamp is in 24-hour format. In 24-hour format, 4 A.M. is displayed as 04:00 and 4 P.M. is displayed as 16:00. *Note that the timestamp changes only when a new ANI comes in, it is not a time-of-day clock.*

USER NAME – This is the name of the user associated with the numeric ID that was received. User names are stored in a database. The database must be configured before names can be displayed.

SCROLL LEFT INDICATOR – Indicates that there are other ANI's previously logged. Press the left <SCROLL> button to view the previously logged items.

POWER / EMERGENCY LED – Glows green when power is turned on. Blinks between orange and green to indicate that an emergency status message was received recently. This indicator remains blinking until the operator presses any key.

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.

4.1.2 Keypad Operation in Display Mode

<SCROLL> LEFT - When in Display Mode, the keypad <SCROLL> keys are used to scroll through the previously logged ANI's. The scroll left indicator remains present on the screen so long as there are more previous entries to be viewed. The scroll left indicator disappears when the oldest entry is reached.

<SCROLL> RIGHT - A scroll right indicator will appear on the right side of the screen when there are newer entries available for viewing. Press the right <SCROLL> button to view the newer entries. When the last entry is reached, the right scroll indicator disappears.

<#> POUND KEY – Repeatedly pressing the <#> key will always return the DDU to display mode with the last ANI received being shown.

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

<SEND> - Activates the radio PTT switch, placing the radio in transmit mode. This is especially useful if your DDU is equipped with an optional gooseneck microphone.

NUMBER KEYS – Pressing one of the number keys <0> through <9> causes the DDU to jump directly into call mode. See **Calling a Unit** for more information.

<*> STAR KEY – Pressing the <*> will place the DDU in Menu Mode at the main menu.

4.2 MENU MODE

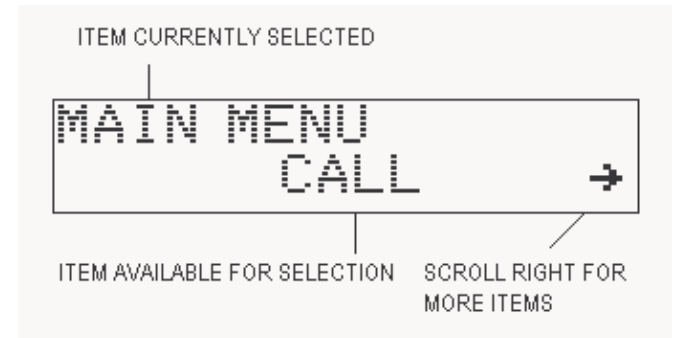
The Menu Mode provides the ability to place calls to radio users and configure the DDU.

4.2.1 Navigating the Menus

Press the star key <*> while in Display Mode to place the unit into Menu Mode. Upon entry to Menu Mode, you will be in the Main Menu. The top line of the display indicates this. The bottom line displays an item

available for selection, in this case the **CALL** command.

The scroll right symbol on the right side of the display indicates that additional items are available. Press the right <SCROLL> button to view the next available item. The scroll left symbol will then appear, indicating that the left <SCROLL> button may be used to go

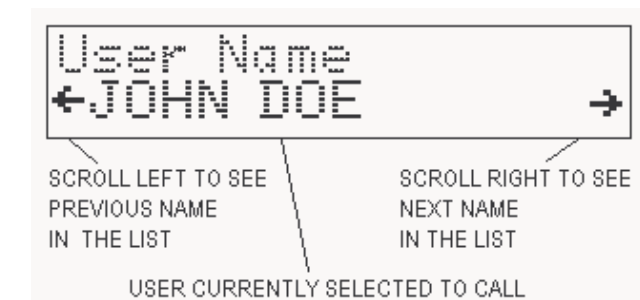


back to the previous item.

To select the displayed item, press the <SEND> button (the <SEND> button acts like an ENTER key when in menu mode). Upon selection, the name of the item will appear on the top line of the display. The bottom line will present additional items for selection. Press the <#> key to return to the previous selection.

4.2.2 Calling a Unit in the Database

To place a call to a unit in the database, first select **CALL** from the Main Menu. Press the right <SCROLL> button to display the first user in the database. Either the User ID will be displayed, or the User Name (alias) will be displayed. This is determined by the **Call Entry Mode** setting.



The left and right scroll indicators will appear on the bottom line. This is 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 digits/letters of the User ID/Name prior to pressing the right <SCROLL> button. The DDU will search the database for users matching the first few digits/letters.

4.2.3 Calling a Unit Not in the Database

To place a call to a unit which is **not** in the database, start by selecting **CALL** from the Main Menu or by pressing a number key while in display mode. Instead of pressing the right <SCROLL> button, simply key the numeric ID of the user to be called using the keypad. Press <SEND> to initiate the call. The left <SCROLL> key may be used as a backspace key to correct any errors made during entry. The <#> key may be used at any time prior to pressing <SEND> to cancel the call.

4.2.4 Numeric vs. Alphanumeric Entry

There are two different data entry modes available on the DDU. As shipped from the factory, **Numeric** entry is the default mode when calling a unit. As numbers are entered, they appear on the bottom-left of the display. Pressing the <*> key while in numeric entry mode changes the mode to **Alphanumeric**.

In alphanumeric mode, you may type in letters and numbers as described in the next section. This allows you to type the name of a user in the database without having to scroll through the names. Alphanumeric data appears on the bottom line of the display as it is entered. You may make alphanumeric call entry the default mode by changing the **Call Entry Mode** setting in the **CONSOLE SETUP** menu.

4.2.5 Entering Alphanumeric Data

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 an alphanumeric field, 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

Note: Alphanumeric mode cannot be used to enter user ID's (ANI's). In alphanumeric mode, numbers are treated the same as letters.

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	SpC=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.

4.2.6 Entering Special DTMF Digits

The DDU 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
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These special digits can only be entered when adding a User ID to the database. They cannot be dialed directly from the **CALL** menu. Also, these special sequences should not be used unless you are using DTMF as the encode or decode format.

4.2.7 Locking and Unlocking the Menus

The menu system incorporates a lock feature to prevent unauthorized personnel from changing the DDU 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** 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.

4.2.8 Repeater Access Control

The DDU can be interfaced to a repeater to limit access only to those users who are authorized. This is accomplished by requiring an ANI of the proper format before granting access. Access can be further restricted by requiring that the ANI match a User ID stored in the database. See **REPEATER SETUP** for more information.

4.3 USER DATABASE

The user database makes day-to-day operation of the DDU much easier. You can use easy-to-remember

names instead of just numbers.

4.3.1 User Database Features

The primary purpose of the user database is to associate names with numbers. This way, when an ANI comes in, the name of the person can be displayed along with the ANI. Having a user database simplifies the calling of units allowing you to scroll through a list of names.

Another feature of the database is the ability to assign **Kill** and **Spy** ID's to a user. These features are designed to work with Midian's encoder/decoder products such as the **UED-1** series. They allow the operator of the DDU to disable a radio in the field or listen in on it.

The DDU can store up to 137 names and ID numbers in its database. The DDU retains the database memory even when switched off.

4.3.2 Setting Up the User Database

Begin by compiling a list of names and ID numbers. 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 for more information.

4.4 STATUS DISPLAY FEATURE

4.4.1 How Status Display Works

The status display feature treats the last digit of an ANI as a status digit. This digit can be translated to a status message that can be displayed on the DDU. Up to 10 status messages can be configured, corresponding to the digits 0-9.

Say for example that the ANI of a particular unit is 1234X where X is the status digit. If you are running a taxi fleet, you may wish to specify status information as follows:

CODE	STATUS MSG	MEANING
12340	<blank>	Normal ANI, no status
12341	OFF DUTY	Off duty, not available
12342	ON DUTY	On duty
12343	FLAG UP	Beginning fare
12344	FLAG DN	End of fare
12345	EN ROUTE	En-route to pickup fare
12346	NO FARE	Nobody at pickup location
12347	REPEAT	Repeat last call
12348	BREAKDOWN	Car broke down

12349	EMERGENCY	Emergency, need help
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You can configure the status messages as you see fit using the **STATUS SETUP** features. If the **Emerg Status** feature is turned on, the status digit 9 is used for emergency ANI. This will cause the emergency LED to blink and an alarm siren to sound (if enabled).

Status messages are not displayed by default, this must be enabled via the **STATUS SETUP** menu. When the **Status Feature** is enabled the last digit of the ANI is automatically blanked out. Instead, the ANI and the status message are placed on the 1st line of the display, alternating every 2 seconds.

5 MENU SYSTEM

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

5.1 CALL COMMAND

Allows you to place a call to units equipped with ANI selective call decoders. You will be given the option to enter the numeric ID of the unit you wish to call. If the user database is set up, you may use the right <SCROLL> buttons to go into **Select Mode** and find the name of the user to be called using the left and right <SCROLL> keys.

Alternatively, you can enter the User ID or User name in part or in whole. When entering the complete name or ID, simply press <SEND> to place the call. When entering a partial name or ID, press the right <SCROLL> button and find the user you wish to call. Remember, you can use the <*> to toggle between numeric and alphabetic entry modes.

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 ACTIONS MENU

5.3.1 Spy command

Allows you to remotely key up and listen to a unit. This feature is designed to work with Midian's **UED-1** series encoder/decoders. The code for spying on a unit must be in the user database to use this function.

5.3.2 Kill command

Allows you to remotely disable a unit. This feature is designed to work with Midian's **UED-1** series encoder/decoders. The code for killing a unit must be in the user database to use this function.

5.3.3 Clear ANI Log command

Allows you to clear the ANI log without having to turn the unit off and back on.

5.4 USERS MENU

5.4.1 Add User menu

Allows you 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 ID and User Name. See **EDIT USER** for more information.

5.4.2 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. 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.

5.4.3 EDIT USER menu

Allows you to change information about a user. Select the user you wish to edit in the same manner as 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.

5.4.3.1 User ID field

This numeric field contains the primary ANI number assigned to the user's radio. This will be the number used when calling a unit. ID's may be 1 to 8 digits depending on the ANI format used.

Range: 0-8 digits

Default: blank

5.4.3.2 User Name field

This alphanumeric field contains the name of the user associated with the user ID. A maximum of 14 characters may be used. See the **Entering Alphanumeric Data** section for more information.

Range: 0-14 characters

Default: blank

5.4.3.3 Spy ID setting

Specify the code required to spy on this unit. Leave blank if not using this feature.

Range: 0-8 digits

Default: blank

5.4.3.4 Kill ID setting

Specify the code required to disable this unit. Leave blank if not using this feature.

Range: 0-8 digits

Default: blank

5.5 SETUP MENU

5.5.1 SOUNDS SETUP menu

5.5.1.1 Keypad Beep option

Turning this option on causes a beep to be heard for each key press.

OFF Keypad beeps off.

ON Keypad beeps on.

5.5.1.2 Beep On ANI option

Turning this option on will cause an alert beep to be heard every time a new ANI is received.

OFF Do not beep when ANI comes in.

ON Beep when ANI comes in.

5.5.1.3 Emerg Siren option

This causes a siren sound to be heard when an emergency ANI is received. This requires turning on the ***Emerg Status*** option in the **STATUS SETUP** menu.

OFF Do not sound siren on emergency ANI.

ON Sound siren on emergency ANI.

5.5.1.4 Internal Speaker setting

Normally, the internal speaker is on. This is required in order for key beeps, error beeps, confirmation beeps, and other system sounds to be heard. This also allows audio received from the radio to be heard at the console. If it is desired that absolutely no sound be heard from the console speaker, this setting allows it to be switched off.

OFF Internal speaker disabled.

ON Internal speaker enabled.

5.5.1.5 Auto Mute Speaker feature

This feature is designed to mute the internal speaker while an ANI is being received. It works in conjunction

with the **Auto Mute Time** in the **RADIO SETUP** menu. When this feature is enabled, the internal speaker remains muted so long as there is no COR indication coming from the radio. When the COR indication goes active, the internal speaker will automatically unmute after the Auto Mute Time expires. **Note:** System sounds can still be heard during the mute period.

OFF Do not mute the internal speaker.
ON Mute/unmute speaker automatically.

5.5.2 TIME SETUP menu

In order for the correct time to be displayed, 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 (except when entering ANI's).

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 DDU 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 Contrast setting

Allows the display contrast to be adjusted for best viewing.

LOW Low contrast setting.

HIGH High contrast setting.

5.5.3.4 Mic. Option setting

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

NONE No microphone.
GOOSENECK Gooseneck style microphone.
PADDLE Paddle style desktop microphone.
HANDSET External handset.

5.5.3.5 Printer Option

The DDU, 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 SECURITY SETUP menu

5.5.4.1 Security setting

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

ON Enable security feature.
OFF Disable security feature.

5.5.4.2 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

5.5.5 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 DDU 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: 0005 to 4000 milliseconds
Default: 0400 milliseconds

5.5.5.2 COR Polarity setting

Determines which state of the COR (carrier detect) input is considered the active state. When COR is active, the radio channel is busy. **Important Note:** The DDU will not decode 5-tone formats unless the COR input is active. If not connecting the COR Input to the DDU, this setting should be HIGH. If the radio is using PL/CTCSS, it is recommended that the COR Input be connected to a point which goes active when PL is detected.

The COR input is used in conjunction with the **Busy Lockout** feature. If not connecting the COR input, do not enable Busy Lockout.

LOW Channel is busy when COR is 0V.

HIGH Channel is busy when COR is 5V.

5.5.5.3 Busy Lockout option

This option prevents the DDU from transmitting on a busy channel. If this option 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 DDU 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.

5.5.5.4 Squelch Polarity setting

Determines the active state of the Squelch Output. The Squelch Output is used in conjunction with the COR Input and the **Auto Mute Time** to mute incoming ANI packets.

LOW Radio is squelched when the Squelch Output. Is brought to GND.

HIGH Radio is squelched when the Squelch Output is not at GND (floating).

5.5.5.5 Auto Mute Time setting

Specifies the amount of time after the COR Input becomes active for the Squelch Output to go inactive. This allows the Squelch Output to be used to mute incoming ANI's if connected to a point which disables the radio speaker. This value should be set to allow for any key-up delay of the transmitting unit as well as the time it takes for the ANI to complete.

Range: 0000 to 4000 milliseconds

Default: 0300 milliseconds

5.5.5.6 Trunk Delay Polarity setting

When using with trunked radios, this setting determines the active state of the Trunking Delay Input

(a.k.a. LTR in). This input is used to hold-off transmitting a call until a channel is acquired on the trunking system. If a channel is not acquired within 4.5 seconds, a timeout will occur and the call will be canceled. **Important note:** The Trunking Delay Input shares the same wire as the Squelch Output. Normally the wire acts as the Squelch Output. The DDU must be jumpered correctly to configure this wire for trunking. Please see the installation instructions.

When not using the Trunking Delay Input, this setting should be HIGH.

LOW Trunking signal goes to 0V when a channel is acquired.

HIGH Trunking signal goes to 5V when a channel is acquired.

5.5.6 ENC/DEC SETUP menu

5.5.6.1 Encode Format setting

The tone-signaling format used to encode outgoing calls. Select from one of the following formats:

DTMF

CCIR

EEA

EIA

ZVEI

DZVEI

DDZVEI

NATEL

MODAT

5.5.6.2 Encode Time 1 setting

When using 5-tone formats (non-DTMF): The amount of time for the **first** tone (or digit) of the encode sequence (may also be a preamble). This is also known as *tone width*. Each ANI format has standard tone widths. Non-standard tone widths are permitted, allowing for faster encode.

When using DTMF format: This is the tone ON time for DTMF format.

Range: 0005 to 1000 milliseconds

Default: 0050 milliseconds

5.5.6.3 Encode Time 2 setting

When using 5-tone formats (non-DTMF): This is the duration of each of the **remaining** tones (or digits) of the encode sequence. Normally, this should be the same as **Encode Time 1**.

When using DTMF format: This is the tone OFF time

(between digits) when using DTMF format.

Range: 0005 to 1000 milliseconds

Default: 0050 milliseconds

5.5.6.4 Decode Format setting

The tone-signaling format of the incoming ANI's. The Encode and Decode formats may be different if desired. Select from one of the following formats:

DTMF

CCIR

EEA

EIA

ZVEI

DZVEI

DDZVEI

NATEL

MODAT

5.5.6.5 Decode Time setting

When using 5-tone formats (non-DTMF): The minimum amount of time a single tone must be present before it is decoded. This time can be as little as 5 milliseconds. This time should be set between 1/2 and 1/5th of the *encode timing*. For example, if the encode timing is 50 milliseconds per digit, then the Decode Time should be set between 5 and 25 milliseconds. The lower the number, the more sensitive the unit will be. When the number is higher, the unit will be less susceptible to falsing on noise.

When using DTMF format: The amount of time after the last digit is received for decode to take place. This value should be at least twice that of the digit OFF time.

Range: 0005 to 9999 milliseconds

Default: 1000 milliseconds

5.5.6.6 Ignore Nonuser option

Turning on this option helps prevent the display of false decodes by ignoring ID's which do not appear in the user database. This can also be used to restrict access to a repeater to only those ID's in the database. See **REPEATER SETUP** for more information.

OFF Display ID's not in database.

ON Ignore ID's not in database.

5.5.7 REPEATER SETUP menu

5.5.7.1 Repeat Control option

Allows the DDU to control access to a repeater.

Causes the DDU to assert a PTT output to a repeater upon receipt of either: (1) any ANI in the format decoded by the DDU or (2) a valid User ID in the user database. To restrict repeater access to valid User ID's only, the **Ignore Nonuser** option in the **ENC/DEC SETUP** must be turned ON. Otherwise, any incoming ANI of the proper format will be considered valid.

Other possible uses of the Repeat Control option include operation of a horn relay or the enabling of a PA speaker. Repeater control output can either be the PTT output, or the MONITOR output (see below).

OFF Repeater control disabled.

ON Repeater control is enabled.

5.5.7.2 Validate Time setting

This sets how long after COR becomes active, that the repeater will be keyed prior to receiving a valid decode. This allows time for the incoming ANI to be broadcast by the repeater before it has been validated. If no ANI (or valid User ID) has been decoded during this time, the repeater will be un-keyed. The repeater will remain un-keyed until COR goes inactive.

If set to 0, the repeater will not be keyed until after the ANI (or valid User ID) has been decoded.

Range: 00 to 99 10ths of a second (0.0 - 9.9 s)

Default: 10 10ths of a second (1.0 second)

5.5.7.3 PTT Hang Time setting

Once validation has occurred, this sets how long the repeater will remain keyed after COR goes inactive. Once the hang timer expires, a new validation will be required to access the repeater.

Range: 00 to 99 10ths of a second (0.0 - 9.9 s)

Default: 20 10ths of a second (2.0 seconds)

5.5.7.4 Hang Reset setting

This setting specifies what is required to reset the PTT hang timer before it expires. This can either be COR or COR+ANI. When set to COR, the hang timer will be reset if COR goes active prior to expiration, allowing the conversation to continue without a new validation. When set to COR+ANI, a new valid ANI will also be required to keep the repeater open.

COR Reset hang timer if COR goes active before the hang time expires.

COR+ANI Require both COR and an ANI (or valid User ID) to reset the hang timer before expiration.

5.5.7.5 Repeater Out setting

This setting specifies which output is used to put the repeater into transmit mode when Repeat Control is enabled.

PTT	PTT output used to key repeater in Repeat Control mode.
MONITOR	MONITOR output used to key repeater in Repeat Control mode.

5.5.8 STATUS SETUP menu

5.5.8.1 Status Feature option

When enabled, the Status Feature always treats the last digit of an incoming ANI as a status digit. The last digit of the ANI is not actually displayed. Instead the user's ANI and **Status Message** are displayed alternately (every 2 seconds).

When the Status Feature is enabled, it will be required that all units send an extra digit after their ANI. See the section on **Status Display Feature** for more information.

OFF	Disable status feature.
ON	Enable status feature.

5.5.8.2 Emergency Status option

When enabled, the Emergency Status option treats any ANI with **9** as the last digit as an *Emergency ANI*. When an Emergency ANI comes in, the PWR-ALM LED flashes rapidly between green and orange. Optionally, the **Emerg Siren** sound can be enabled to alert the system operator of the emergency situation.

The Emergency Status option may be used alone, or in conjunction with the **Status Feature** option. When used alone, the digit '9' will appear and the status message is not displayed. Also, the User Name in the database will not be properly displayed.

When used in conjunction with the **Status Feature**, the '9' will not be displayed. Instead, **Status 9 Msg** will be displayed (unless it is blank), alternating with the ANI. The User Name in the database will be properly displayed.

OFF	Display ID's not in database.
ON	Ignore ID's not in database.

5.5.8.3 Status 0 Msg setting

Allows you to specify the status message displayed when using the **Status Feature**. When using this feature, the last digit of the ANI will be used to determine the status. There is a status message for each of the digits 0 through 9. Each status message may be up to 10 alphanumeric characters.

Range:	0-10 characters
Default:	<u>blank</u>

5.5.8.4 Status 1 Msg setting

See *Status 0 Msg setting* above.

Range:	0-10 characters
Default:	<u>blank</u>

5.5.8.5 Status 2 Msg setting

See *Status 0 Msg setting* above.

Range:	0-10 characters
Default:	<u>blank</u>

5.5.8.6 Status 3 Msg setting

See *Status 0 Msg setting* above.

Range:	0-10 characters
Default:	<u>blank</u>

5.5.8.7 Status 4 Msg setting

See *Status 0 Msg setting* above.

Range:	0-10 characters
Default:	<u>blank</u>

5.5.8.8 Status 5 Msg setting

See *Status 0 Msg setting* above.

Range:	0-10 characters
Default:	<u>blank</u>

5.5.8.9 Status 6 Msg setting

See *Status 0 Msg setting* above.

Range:	0-10 characters
Default:	<u>blank</u>

5.5.8.10 Status 7 Msg setting

See *Status 0 Msg setting* above.

Range:	0-10 characters
Default:	<u>blank</u>

5.5.8.11 Status 8 Msg setting

See *Status 0 Msg setting* above.

Range:	0-10 characters
Default:	<u>blank</u>

5.5.8.12 Status 9 Msg setting

See *Status 0 Msg setting* above. Note that this status message is associated with emergency status.

Range:	0-10 characters
Default:	<u>blank</u>

5.5.9 UTILITIES menu

5.5.9.1 *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.

5.5.9.2 *Clear Database*

This will clear the user database of all ID's and User Names. The contents of the other parameters listed above will not be affected.

5.5.9.3 *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.** Damage to the unit may result.

6 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 137 cannot be exceeded.

Solution: Remove any old user names that are no longer in service. If this is not possible, contact Midian to learn about our Computer Aided Dispatch (CAD) fleet management systems which can handle many more users.

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 ID

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

Solution: Choose a unique user ID 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.

FIELD IS BLANK

Reason: An attempt was made to place a call, but the user ID or name was blank. An attempt was made to spy or kill and the respective field in the database is blank.

Solution: When placing a call, be sure an ID number or user name is displayed before pressing <SEND>. The spy and kill functions require there be an entry in the respective field of the user database.

MODEM TIMEOUT

Reason: The DDU expects a call to be completed within 4.5 seconds and this time has been exceeded. This can happen if the total of the key-up delay and tone widths exceed 4.5 seconds. This can also happen when used in a trunking system and a channel cannot be acquired. It is also possible that there could be a hardware failure.

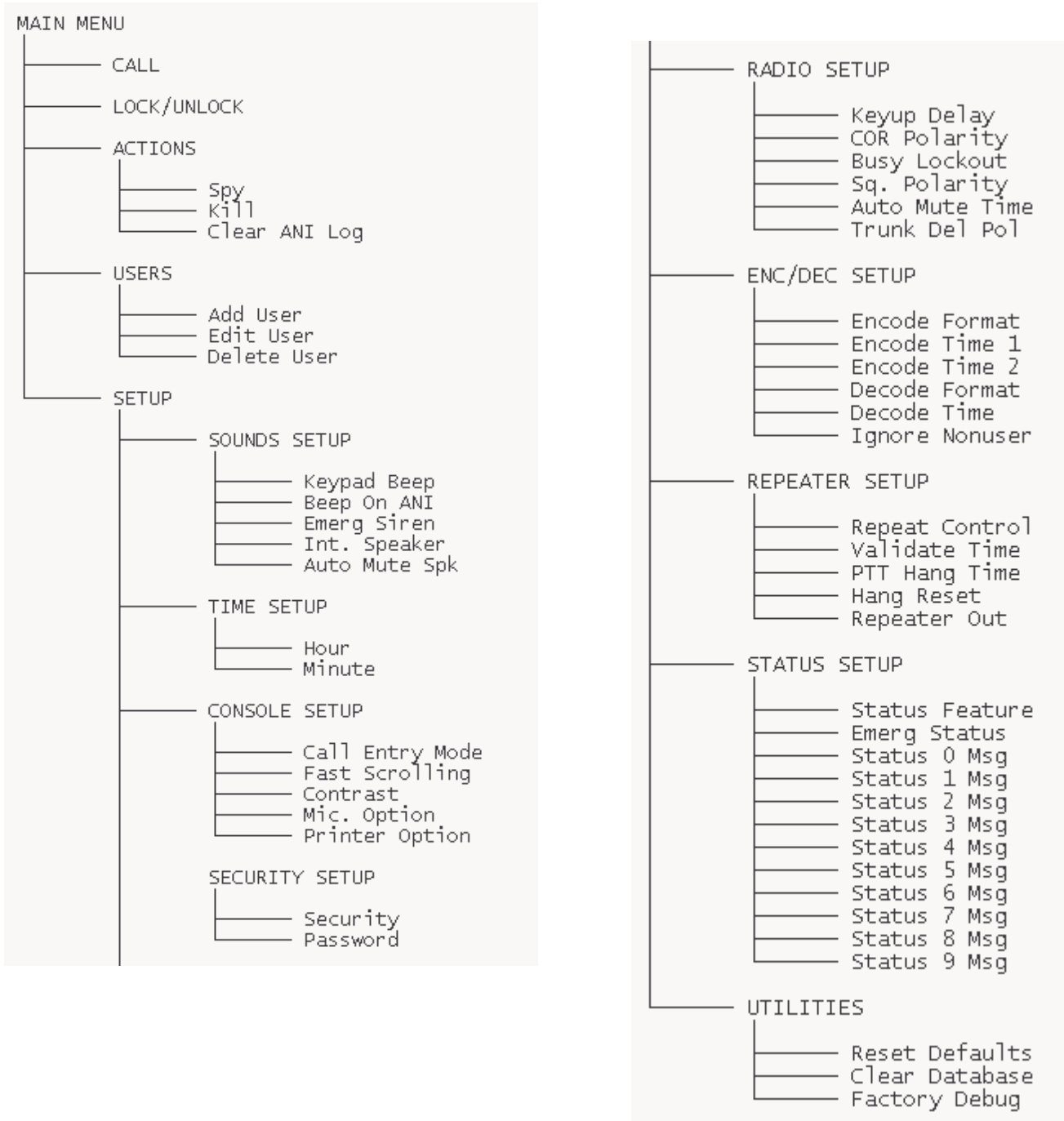
Solution: If total time of the key-up delay and signaling tones exceeds 4.5 seconds, simply press <SEND> to clear the message from the display. The call will still be sent. If the timeout is caused by excessive channel acquisition time in a trunking system, press <SEND> to clear the error and try placing the call again. In the event of a hardware failure, contact Midian technical support to determine if that is the cause.

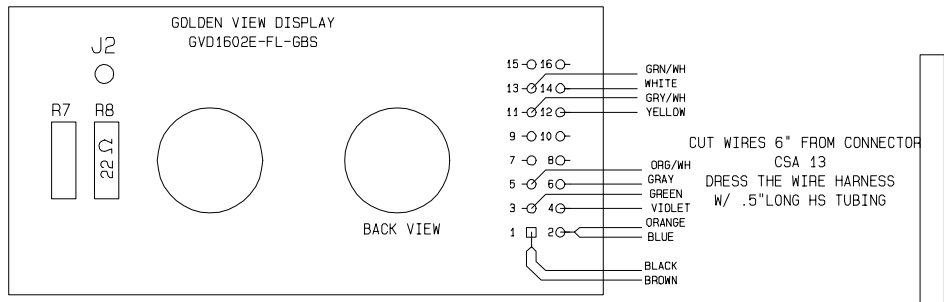
NOT FOUND

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

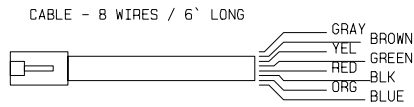
Solution: When selecting a user to call, the name or the ID can be entered in whole or in part. When entering a partial name or ID, press the right <SCROLL> button to search the database for the first partial match. Press <SEND> only if the whole ID or name has been entered. There may be no entry in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

7 MENU SYSTEM MAP



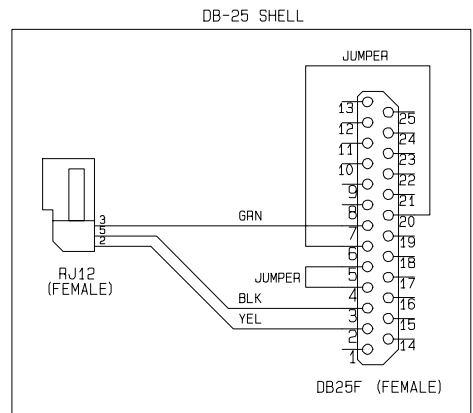
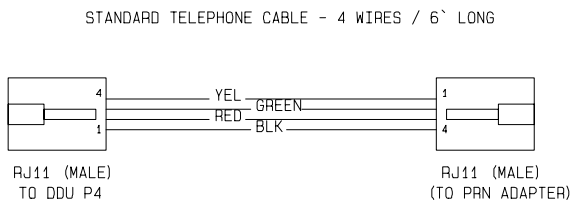


REMOVE EXISTING RES R8. REPLACE WITH 22 Ohm.
INSTALL JUMPER J2 WHEN THERE IS PROVISION FOR IT.



MIDIAN ELECTRONICS				
DATE	MAY 00	DWN.BY	AIB	APPR.
DESIGN	CJS	REV.	APR 9/03 AB	

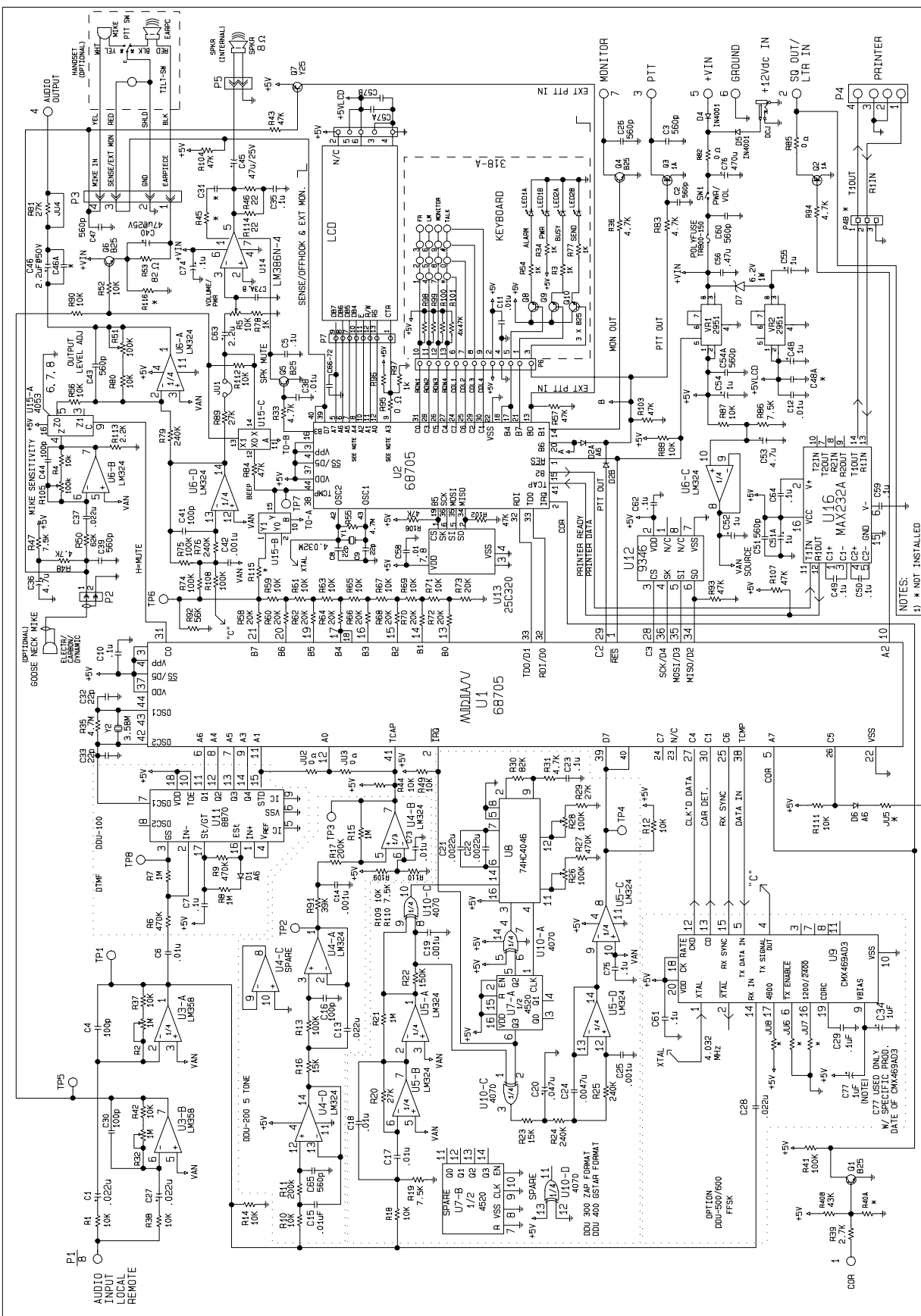
DDU/PDE1 PAGING & DIALING ENCODER	REV. B	FILE NO. 318B.SCH
SCHEMATIC	SHEET	DWG.NO. 318.CHD
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NOTE: BLUE, RED AND WHITE WIRES ARE NOT USED

MIDIAN ELECTRONICS				
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DESIGN	BB	REV.	APR 9/03 AB	

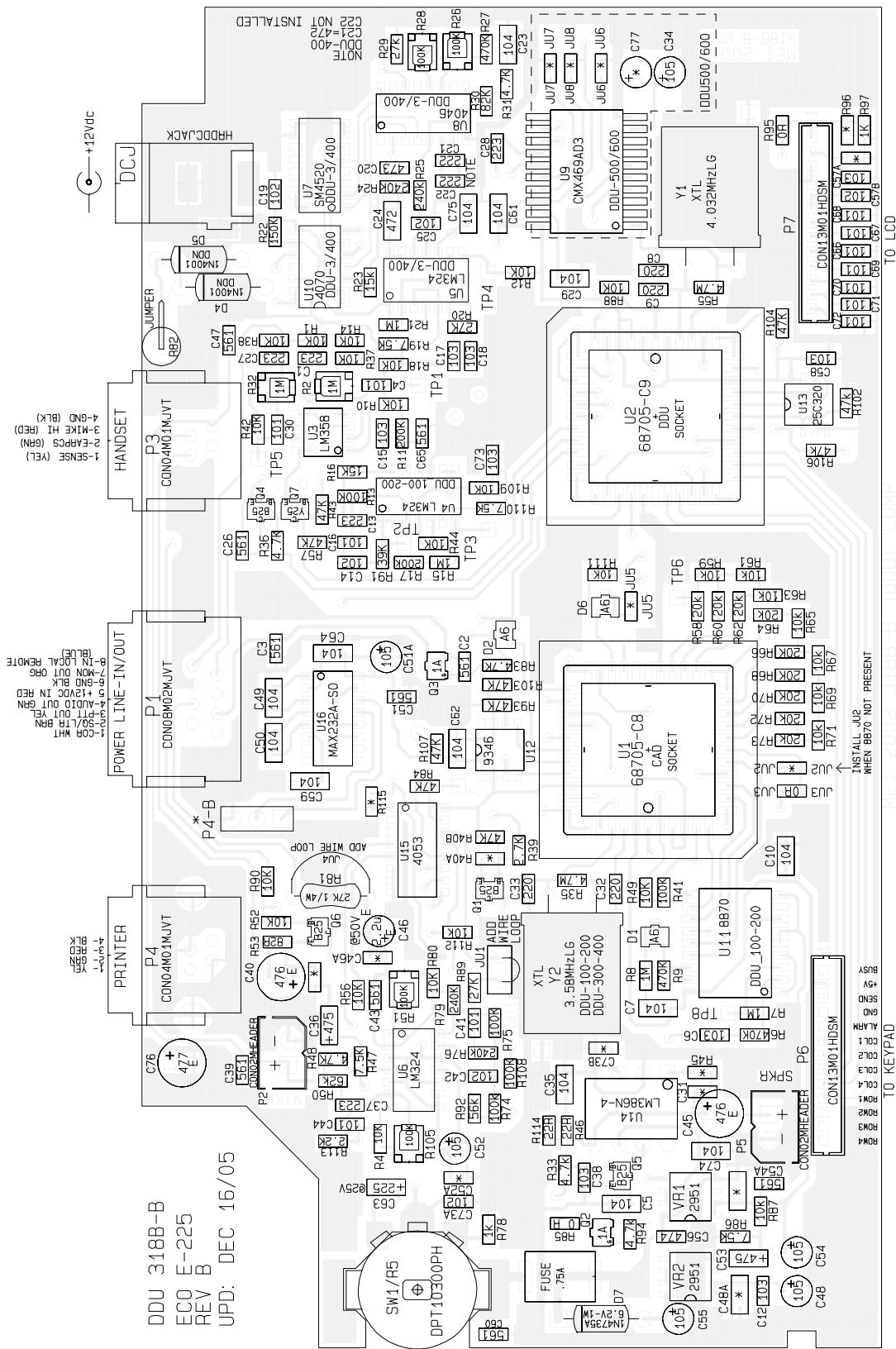
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SCHEMATIC	SHEET	DWG.NO. 318.CHD
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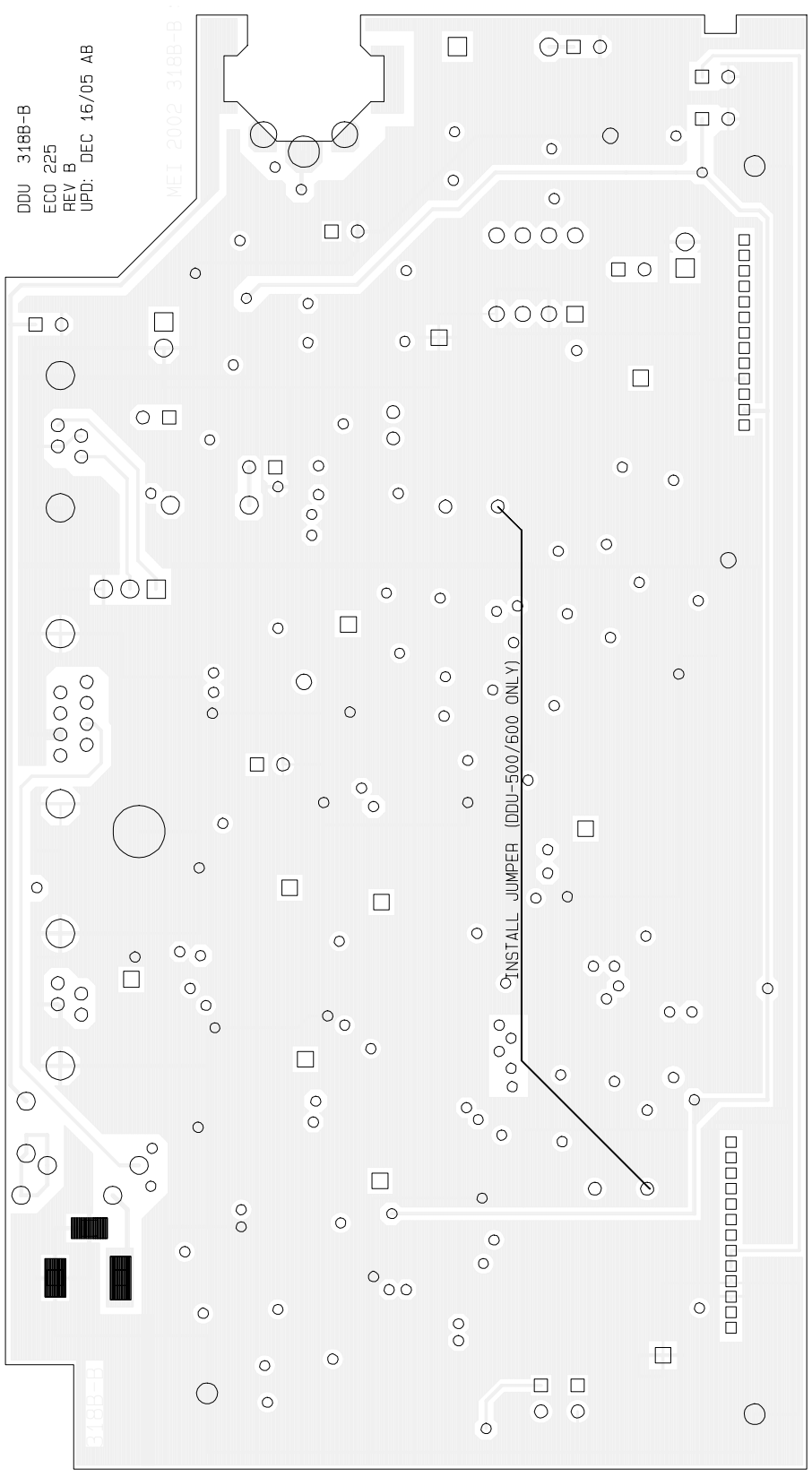
NOTES:
1) * NOT INSTALLED

DATE	MAX 2K	OWN BY	ATB	APPR.	FILE NO.
DESIGN	C.S	REV	DEC 16/05 AB		318RB SCH
					SHEET ONE NO.
					318 CHD
					E-225

DDU SERIES	DISPATCH DISPLAY UNIT	SCHEMATIC	COPYRIGHT © 2006
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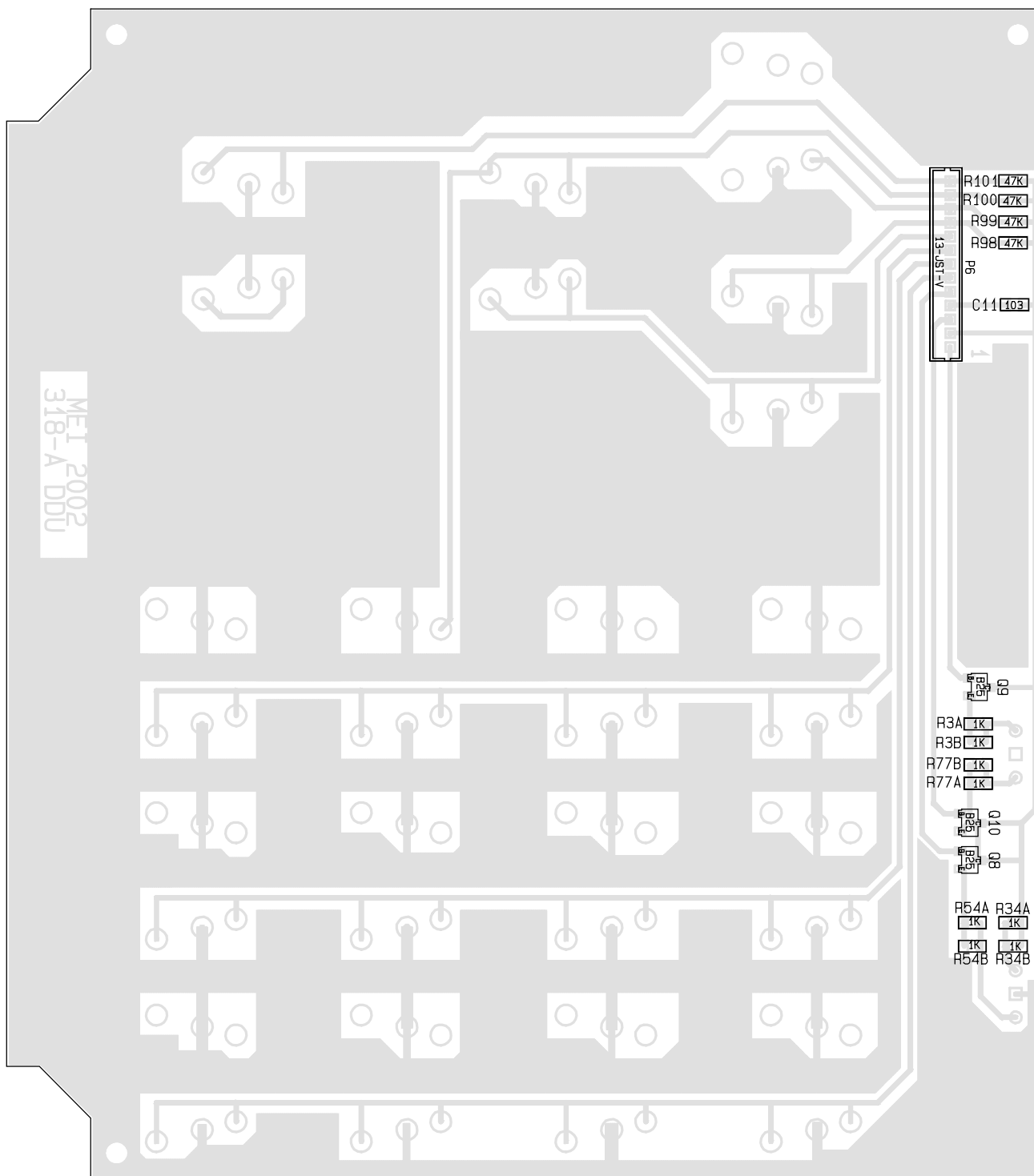
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DATE	MAY 2K	DWN.BY	AB	APPR.			
DESIGN	CJS	REV.	DEC 16/05	AB			
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				PICTORIAL			
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				Dwg NO. 318.RB.PCB			
				FILE NO.			



DDU 318B-B
ECO 225
REV B
UPD: DEC 16/05 AB

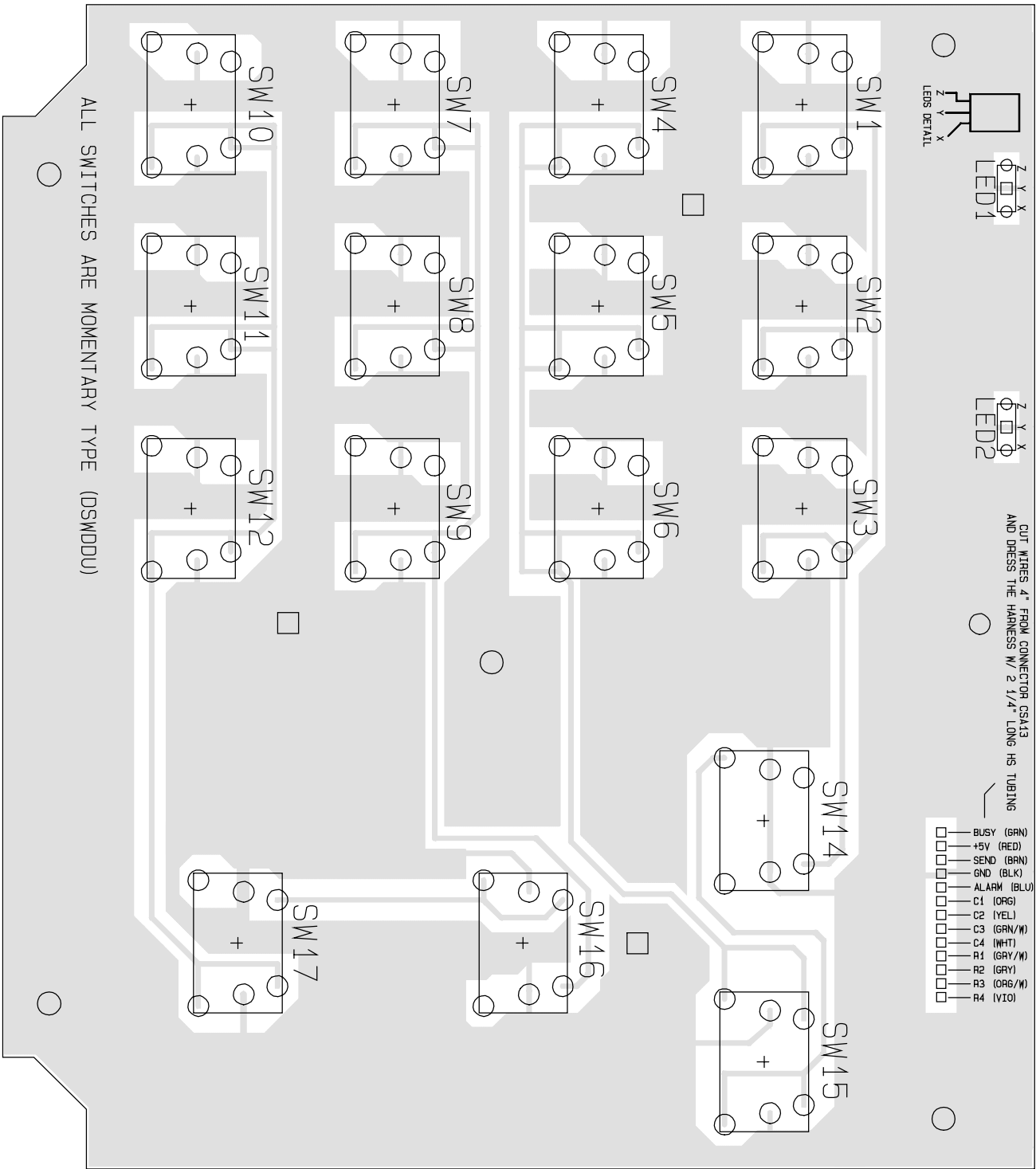
MEI 2002 318B-B

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REV. DEC 16/05 AB		COPYRIGHT © 2005		ECO	318.CHP
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DESIGN	CJS	REV. FEB 16/02	AB	

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