



RM-1

Repeater Maker with Morse Code Station Identifier

Manual revision: 2006-11-01

Software Versions: 2.3 & Higher

SPECIFICATIONS

Operating Voltage5.5-15 VDC
Operating Current..... 3 mA

OUTPUTS

PTT Output Current.....100 Ma
Morse Code ID Audio Output Level..... 1V RMS
Voice Audio Output Level 1V RMS
Audio Output Impedance..... 10K Ω or 22K Ω

MECHANICAL

Dimensions.....2.39" L x 1.89" W x .39" H
Operating Temperature..... -30 to +60°C

TIMING

Station ID.....16 characters
Second Station ID or Message.....120 characters
Morse Tone Frequency0001-3000 Hz
Morse ID Repeat Interval Time01-99 minutes
Front Porch Keyup Delay0.5-9.9 seconds
Code Speed 1-99 WPM
Wait period after loss of COR 1-99 seconds
PTT Time Out Timer 0-999 seconds
PTT Hang Timer..... 0-999 seconds

INSTALLATION INSTRUCTIONS

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. Please be careful when selecting wire colors. It is sometimes difficult to distinguish between the grey, black, and brown wire colors under fluorescent lighting. We suggest using Color-Bright/Color-Corrected or incandescent lighting. If in doubt, compare wire positions on board layout for correct color code.

Wire	Function	Instructions
Black	Ground	Connect to nearest ground point. <u>Make sure common ground exists between both the receiving radio and transmitting radio.</u>
Red	5 - 15 VDC	Connect to switched B+ in either the receive or transmit radio.
Brown	Primary Receiver COR/COS Input	Connect to a point in the receiving unit's Squelch circuit that changes logic level when carrier is received. Program desired COR/COS polarity in COR/COS Polarity in Channel Busy Control (Register 6) . A radio whose squelch circuit provides a logic low or logic high can readily turn the COR/COS transistor, Q1, on and off. If the point that this lead is hooked to only makes a minute change in voltage, it will be necessary to adjust the values of R6, R7 and R8 to cause Q1 to change states. <u>This wire is employed to hold off the Morse ID if the channel is busy and the unit is programmed for COR loss delay (Register 6A).</u>
Green	Tone/Voice Out to Modulator	Connect to a point in the transmitting unit's modulator circuit. In Low-Z mic circuits, it may be necessary to short R23. Adjust R22 for 4.5 KHZ of deviation on peak voice from the receiver. If the orange RX wire is connected after the receiver's volume control you may want to adjust the volume control in conjunction with R22. FCC rules part 90.425 state that the signal output of the ID signal shall be 40% ±10% of the maximum permissible modulation or deviation. Adjust R19 for 40% of system deviation after adjusting voice modulation.
Blue	Alert speaker audio	This provides annunciated keyboard sidetone for programming via the keypad. Connect to high side of speaker. (Speaker completes ground path for speaker emitter-follower transistor, Q3.) CAUTION: When attaching this lead to a 4 or 8 Ohm speaker, add a 100 Ohm resistor in series with this blue lead to limit current. When using 20-40 Ohm speakers, the onboard resistor in series with Q3 should be sufficient.
Gray	Primary Receiver CTCSS/DCS In (Optional COR)	This is the actual control input for the RM-1. It receives a logic level from the radio's CTCSS or DCS decoder. The RM-1 will only repeat when it sees the proper CTCSS decode logic level change. If the radio does not employ CTCSS or DCS connect this to the receiving radio's Carrier Detect and leave the COR/COS wire disconnected and program for a logic high on the COR polarity (Register 6). If the COR busy lead is not left disconnected the RM-1 will see a busy condition and will not repeat on straight carrier.
White	PTT out	Connect to the transmitter PTT In. This keeps the radio keyed while sending Morse. The surface mount PTT transistor Q6 is rated at 100ma continuous. Therefore, use caution when connecting to old radios that employ relay coils with heavy coil currents. Also install a diode parallel to the relay coil to eliminate Counter EMF or serious damage may result to the microprocessor and void the warranty.
Orange/White	Message Select/ Program Input	If this input is <u>not</u> connected to ground, the first station ID will be sent, based upon the condition of the COR/CTCSS inputs. If this input is grounded, the second station ID or message will be sent. For programming with the KL-3, this input should be connected to the green lead of the KL-3.
Violet	Optional Secondary Receiver Inhibit	A logic low on this input can be used from an auxiliary receiver COR or CTCSS output to inhibit an ID on a repeater system with simplex users operating on the repeater's transmit frequency.
Orange	Receive Audio Input	Connect to discriminator, de-emphasized audio, or low-pass audio point in receiver.
Gray/White	PL Inhibit Line	This output will be taken to ground during Morse Code ID generation.
Green/White	Program Enable	For programming with the KL-3, this lead should be grounded before power up to force the RM-1 into programming mode.

1.0 OPERATION

1.1 Applications

The repeater maker can be used in 5 different configurations.

- 1). A simple duplex repeater maker with no Morse ID and no Touch Tone® access.
- 2). A duplex repeater maker with Morse ID.
- 3). A duplex repeater maker with Touch Tone® access and Morse ID.
- 4). A duplex repeater maker with Morse ID and Touch Tone® enable/disable.
- 5). A semi-duplex repeater maker for low power portable to high power mobile ricochet operation with no Morse ID and no DTMF access. This requires 2 units.

1.2 Theory of Operation

The RM-1 is a miniature low cost duplex repeater maker. It employs a microprocessor for timing, control, Morse ID, and DTMF acquisition.

Both the COR and Inhibit line prevent the unit from Morse IDing over a conversation. The COR is designed to prohibit IDing on your own carrier detect on your receiver. The Inhibit line is designed to prohibit IDing when a carrier is detected on an auxiliary receiver tuned to the repeater's transmit frequency.

The CTCSS/DCS input is designed to be the active input to the RM-1. It is normally connected to the CTCSS/DCS decoder in the receiver and will only repeat when the correct code is decoded. In this configuration it will not allow a different CTCSS or carrier operated unit to use the repeater maker. In the absence of a CTCSS/DCS decoder it can be connected directly to the carrier detect output in the receiver. In this case all incoming traffic will be repeated unless the Touch Tone® access ID feature is turned on to prevent unauthorized access. If the ninth register is used as a disable register nothing will be repeated until after the unit has been enabled with the proper ID code. The CTCSS/DCS inputs directly through the microprocessor and triggers the squelch transistor Q5. This prevents unsquelched audio from the receiver to be passed out to the transmitting radio's modulator.

R47 and C19 serve as a de-emphasis circuit in case audio is taken directly from the discriminator. If this circuit is not needed C19's ground can be cut to eliminate the circuit. This is shown as an asterik (*) on the board layout under C19 just above the fourth pin of the VR1 regulator. U2A is a high pass filter for removing CTCSS tones from the voice audio.

Neither of these circuits are necessary if the audio is picked up in the receiver after the high pass and after

de-emphasis. U2B acts as an audio amplifier Its gain is controlled by the ratio of R5 over R4. The gain is a little over 2. If necessary the feedback resistor R5 could be raised to increase the gain for the received audio. R19 sets the Morse ID levels into U2B. This is a 1 MEG pot that is designed to roll off a high level coming from the 8-bit DAC. R18 and C18 filter the stair step sine wave from the DAC. Pot R22 sets the modulation to the radio. Set this to the desired level usually 4.5 – 5 KHZ on wideband, or 2.25 – 2.5 KHZ on narrowband on peak incoming voice. Then set R19 so that the Morse ID goes out at about 40% of peak modulation (2 KHZ wideband, 1 KHZ narrowband).

If the transmitting radio has a low impedance input it may be necessary to lower or short-out R23.

U4 is a DTMF decoder for decoding the access and disable IDs. Q3 is an emitter follower transistor that is connected to a speaker with one end of the speaker grounded. This allows you to hear the key chirps as audible feedback during programming. This wire could also be hooked to a device like a Sinadder or audio amplifier provided a ground path exists for the emitter follower. Q6 is the push to talk output transistor and will generally pull to ground with its open collector output.

1.3 Controls and Indicators

The RM-1 is controlled by the CTCSS/DCS inputs, Inhibit inputs, and the COR/COS inputs. There is also a speaker output, which sounds a beep when a key is pressed and emits side tone when tones are generated.

2.0 PROGRAMMABLE FEATURES

2.1 Registers 1 & 2 - Programmable ID & Message

Register R1 if used, can contain a keyboard-programmed station ID of up to 16 characters in length. The user may wish to prefix the letters DE before the message, meaning "from." **Register 2** contains a second identification or message of up to 120 alphanumeric characters.

The Message Select Input, when not grounded allows the 16-character station ID to be sent, based on the condition of the COR/COS inputs, Inhibit input & CTCSS/DCS inputs. When the Message Select Input is grounded, the second ID or 120-character message is sent instead.

When using the keyboard pressing *1 sends the station ID and pressing *2 sends the second ID or message. Pressing # sends solid tone for modulation set up. The # key can also be used to manually send Morse code. Loss of PTT is delayed, so the transmitter does not drop in and out when sending Morse by manual means.

Register R2 permits a message of up to 120 alphanumeric characters, which could be used for sending pre-programmed messages or for use in amateur radio testing. For Ham radio applications, the

speed could be set at 5 WPM for novice class tests, 13 WPM for general class, 13 WPM for advanced class, and 20 WPM for amateur extra.

NOTE: Morse IDs will not be transmitted when the CTCSS/DCS input goes low. If the Touch Tone decode register 8 has a number in it or if register 9 has been disabled. If register 8 is programmed it will also require the access code to turn on the RM-1's PTT output.

2.2 Register 3 – Morse ID Control

2.2A Register 3A - Morse Tone Frequency

The Morse tone frequency (**Register 3A**) is programmable from 1 to 3000 Hz in one-cycle increments. FCC rules state that the frequency shall be 800 – 1200 Hz.

2.2B Register 3B - Words Per Minute

The speed is programmable from 1 to 99 WPM (**Register 3B**). FCC rules part 90.423 states that the transmission rate shall be between 20 and 25 WPM.

2.2C Registers 3C - Repeat Interval

The RM-1 also has a **repeat interval (Register 3C)** that is programmable from 01 to 99 minutes. This allows the user to program how often the ID or message is sent.

FCC rules state that the station should be identified during each transmission or exchange of transmissions. During periods of continuous operation: once each 15 minutes for commercial, once each 10 minutes for amateur, or once each 30 minutes in public safety and special emergency radio services.

2.2D Registers 3D – When to ID

Programming a 0 at the end of **register 3D (When to ID)** will cause the ID or message to be sent following the last activation of the CTCSS/DCS inputs, provided the time is met that is programmed in Register 3C (repeat interval). Also see Register 4E for Morse ID lockout inhibit.

Programming a 1 at the end of register 3D will cause the ID or message to be sent at the expiration of the repeat interval timer. For example, if register 3C is programmed as 10 and register 3D is programmed as 1, the ID and message will be sent continuously every 10 minutes. This will occur under a conversation if one is in progress when the timer goes off.

Programming a 2 at the end of register 3D will cause the ID or message to be continuously sent for the time programmed in register 3C only when the radio is keyed or during key-up time. This will occur under a conversation if one is in progress when the timer goes off.

2.3A Register 4 – CTCSS Input Control

2.3A Register 4A – CTCSS On/Debounce Time

Program this register from 0.0 to 9.9 seconds. This debounces the CTCSS input if the carrier is experiencing picket fence fading.

2.3B Register 4B – CTCSS Off/Debounce Time

Program this register from 0.0 to 9.9 seconds. This performs the same function as register 4A above.

2.3C Register 4C – Courtesy Go-Ahead Beep on Loss of CTCSS/DCS Input

0 = no go ahead/courtesy beep.

1 = beep (Morse code E (•)).

2 = Over or back to you (Morse code K (–•–)).

2.3D Register 4D – CTCSS/DCS Active Polarity

0 = logic low.

1 = logic high.

2.3E Register 4E – Morse ID Lockout Inhibit

The following conditions only apply when the unit is repeating a conversation or during the subsequent hang time.

0 = none. Morse ID will go out under the voice at FCC specified 40% of modulation. Programming a 0 will cause the unit to ID after the repeat interval time in register 3C has expired regardless of whether or not a conversation is in progress.

1 = Lockout during valid CTCSS/DCS input (conversation). Based on CTCSS debounce in register 4B. Programming a 1 prevents the ID from going out when a conversation is in progress.

2 = After the hang time. Programming a 2 prevents the Morse ID from going out during the hang time period programmed in register 5A. It will ID after PTT is finished.

3 = Never ID. This effectively turns off both IDs.

2.4 Register 5 – PTT Output Control

2.4A Register 5A – Repeater Hang Time

This register programs how many seconds the repeater's transmitter will stay keyed after loss of CTCSS/DCS input. Normally this is programmed for 2 to 7 seconds. If using the RM-1 to set up numerous repeaters in sequence with Touch Tone® accessing, the repeater could be set up to have a long hang time so that it does not have to be reaccessed if someone stops to think and drops the carrier or CTCSS for too long. At the end of conversation a Touch Tone® command can be sent to immediately knock down all sequenced repeaters using register 9 (disconnect ID).

2.4B Register 5B – Repeater Time Out Timer

If programmed to 000 this function is off. Programming from 001 – 999 seconds will set the repeater to drop out after the number of seconds programmed in this register. Time out Timer is designed to limit conversational length.

2.4C Register 5C – Front Porch Keyup Delay

The unit has a keyup delay--programmable from 0.0 to 9.9 seconds, which allows for a front porch delay time before the ID or message is sent. This gives receiving units with CTCSS decoders time to unsquelch before any Morse code is transmitted.

2.4D Register 5D – PTT Output Active Polarity

This register programs the active polarity of the Push To Talk circuit. Virtually all mobile radios employ logic low (negative polarity) to key a radio transmitter. If you run into a unit using positive polarity (logic high) it may be necessary to install a pull-up resistor to 5 V on the PTT wire, if one is not already in the radio's PTT circuit. Then program to positive polarity. The white PTT out lead employs an open collector transistor with no pull-up resistor.

2.5 Register 6 – Channel Busy Control

All items in this register are always active if connected.

2.5A Register 6A – COR Loss Delay Before ID

This programs from 0.0 to 9.9 seconds how long before the Morse ID will transmit after COR loss assuming the repeat interval in register 3C has expired.

2.5B Register 6B – COR Active Polarity

This register allows you to select positive or negative polarity.

0 = logic low.

1 = logic high.

2.5C Register 6C – Inhibit Line Loss Delay Before ID

This programs from 0.0 to 9.9 seconds how long before the Morse ID will transmit after Inhibit loss assuming the repeat interval in register 3C has expired.

2.5D Register 6D – Inhibit Line Active Polarity

This register allows you to select positive or negative polarity.

0 = logic low.

1 = logic high.

2.6 Register 7 – DTMF Decode Control

2.6A Register 7A – DTMF Interdigit Timeout

This register is programmable from 0.0 to 9.9 seconds. When using manual dialing this register sets the drop out time between valid digit sequences. For manual dialing we recommend 1 second. For automatic

number identification on PTT to access the RM-1 use approximately 100 msec. This number must be greater than the duty cycle off time between ANI digits. When this interdigit gap time is exceeded the RM-1 considers the next incoming number to be part of a new dialing sequence.

2.6B Register 7B – Single Tone Decode Time

This register is programmable from 0.0 to 9.9 seconds. This allows the user to access the RM-1 with a single Touch Tone digit. We recommend using at least 500 msec in this register to prevent accidental voice talk off of the RM-1's DTMF decoder.

2.6C Register 7C – Repeater Maker Disable

This register allows you to utilize register 9 as either a disconnect ID or a disable ID.

0 = allows the RM-1 to disconnect and terminate its hang time immediately upon acquisition of the disconnect code sequence.

1 = allows the RM-1 to be disabled so that unauthorized users cannot access the repeater. You may want to set the disable ID number to a different or longer number than register 8 (Connect/Access ID).

2.7 Register 8 – Connect/Access ID

This register can be a single digit or multi-digit ID number for protective access of the RM-1. If no number is programmed here the RM-1 will activate on its CTCSS/DCS input.

Register 8 is not active if Register 7C is programmed with a 1 that activates Register 9 for enable/disable ID toggle-action.

2.8 Register 9 – Disconnect ID/Disable ID

This ID when used as a disconnect can cause the hang timer to be reset after decoding the sequence. This is useful on multihop repeater systems with long hang times. When the conversation is finished this number can terminate the hang timer. When used as a disable ID we recommend using a long sequence and preferable one different than register 8 (Connect/Access ID). The RM-1 will remain disabled until it sees this number with the proper dialing speed duty cycle programmed in register 7A (DTMF Interdigit Timeout). When this number is received the RM-1 will become enabled. When the number is transmitted again the RM-1 will be toggled off into a disabled state. When the unit is toggled on it will transmit an N (–•) in Morse code. When the unit toggles off it will send an F (••–•) in Morse code.

3.0 KL-3 PROGRAMMING

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

Set the parameters of the RM-1 to fit the application. If any clarifications on a feature are required, move the mouse cursor over the feature name until the question mark appears and right click, a definition of the feature will be shown.

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

Connect the Orange/White wire to the Green KL-3 lead and the Black wire to a common ground with the KL-3's Black lead. The Yellow clip lead is not used with these products, as the RM-1 is non-readable.

Ground the PTT Enable (Grn/Wht Wire); turn on power, and within 5 seconds click "Program Unit" in the menu bar to send the file to the RM-1.

4.0 KEYPAD PROGRAMMING

4.1 Entering Program Mode

Apply power to the unit and press # to clear any pending keystrokes. Enter the number

2 7 1 8 2 8 1 8 2 8 4

The unit will output three beeps, indicating that the programming mode is active.

4.2 Programming Alphanumeric Registers R1 & R2

Press *1 to program alphanumeric register R1 for station ID. Press *2 to program alphanumeric register R2 for message or secondary ID. When in the alphanumeric programming mode, pressing a button once selects the first character on the keypad (see keypad drawing on the top of the programming worksheet) and generates a single beep. Pressing the button twice selects the second character, emitting two beeps. Pressing the button three times, selects the third character, emitting three beeps. Pressing the button four times selects the number and generates a solid tone. To program the character and advance to the next position in the word, press * once. To advance to the next word, press **. Pressing # exits the alphanumeric programming mode. To exit the register programming mode, press *0.

Note: Registers R1 and R2 are alphanumeric registers and are programmed differently than registers R3 through R9. To clear registers R1 and/or R2 enter *1*# or *2*#.

4.3 Programming System Registers R3 - R9

To change the contents of any system register except R1 or R2, key in the required data from the programming sheet then press * n where n=register 3-9. If fewer digits are entered than the register requires, trailing zeros are assumed. Extra digits are ignored.

To exit the programming mode, press * 0

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

4.4 Programming Example

This example reprograms a unit that has already been programmed to change the station ID to MIDIAN 123 and to change the ID frequency to 2000 Hz at 25 WPM with a repeat interval of 15 minutes.

1. Apply power to the RM-1 and connect the sidetone speaker lead.
 2. Press # to clear the unit.
 3. Enter the programming access code: 27182818284.
 4. Press *1 to enter the station ID alphanumeric mode.
 5. Press 6* to program M and advance to the second character.
 6. Press 44* to program I and advance to the third character.
 7. Press 3* to program D and advance to the fourth character.
 8. Press 44* to program I and advance to the fifth character.
 9. Press 2* to program A and advance to the sixth character.
 10. Press 66** to program N and advance to the next word.
 11. Press 1111* to program 1 and advance to the next character.
 12. Press 2222* to program 2 and advance to the next character.
 13. Press 3333* to program 3 and advance to the next character.
 14. Press # to exit the ID alphanumeric programming mode.
- To program registers 3-9 use the following examples for register 3.
15. Press 2000 to set the ID frequency to 2000 Hz (in register 3A.)
 16. Press 25 to set the 25 WPM in register 3B.
 17. Press 15 to set the repeat interval to 15 minutes in register 3C.
 18. Press 0 to set when to ID for after PTT (register 3D).
 19. Press *3 to enter the tone frequency, WPM, repeat interval, and when to ID into register 3.
 20. Registers 4-9 work the same way as register 3.
 21. Press * 0 to exit the programming mode and return to normal operation.

RM-1 FACTORY DEFAULT PROGRAMMING

(Factory programming can be selected by holding down *3 on the keyboard & turning on power)

Register 1: Station ID (16 Alphanumeric Characters) *1 R M 1 etc.#

Register 2: Message (120 Alphanumeric Characters) *2 R M 1 B Y etc.#

Register 3: Morse ID Control 1 2 0 0 2 0 0 1 1 *3

- A). Tone frequency (0001-3000 Hz) _____
- B). Words Per Minute (01-99 wpm) _____
- C). Repeat Interval Timer (01-99 minutes) _____
- D). When to ID _____

0 = after CTCSS/DCS input that occurs since last ID. If no CTCSS que up;
1 = ALWAYS CONTINUOUS. Will send ID every XX minutes based on time programmed in Register 3C. Will send ID under conversation if one is present.
2 = Will cause the ID or message to be continuously sent for the time programmed in Register 3C **ONLY** when the radio is keyed or during key-up time. Will send ID under conversation if one is present.

Register 4: CTCSS Input Control 0 1 0 3 1 0 0 *4

- A). CTCSS On debounce time (0.0-9.9 sec.) _____
- B). CTCSS OFF debounce time (0.0-9.9 sec.) _____
- C). Courtesy go-ahead beep on loss of CTCSS/DCS input _____
(0=none, 1="E", 2="K")
- D). CTCSS active polarity _____
(0=logic low, 1=logic high)
- E). Morse ID Inhibit _____

0 = no inhibit - follows repeat interval timer Register 3C;
1 = inhibit during CTCSS/DCS input - then send after loss of CTCSS/DCS input & CTCSS debounce time Registers 4A & 4B;
2 = inhibit during hang time - until conversation is finished;
3 = always inhibit - disables Registers 1 & 2

Register 5: PTT Output Control

0 0 1 0 0 0 0 3 0 *5

- A). Repeater Hang Time (seconds) _____
000-999 seconds (000=off)
- B). Repeater Timeout Timer (seconds) _____
000-999 seconds (000=off)
- C). Front Porch Keyup Delay (0.0-9.9 seconds) _____
- D). PTT Output Active Polarity _____
(0=logic low, 1=logic high)

Register 6: Channel Busy Control

All items in register 6 are always active if connected

0 1 1 0 1 0 *6

- A). COR Loss Delay Before ID (0.0-9.9 sec.) _____
- B). COR Active Polarity _____
(0=logic low, 1=logic high)
- C). Inhibit Loss Delay Before ID (0.0-9.9 sec.) _____
- D). Inhibit Active Polarity _____
(0=logic low, 1=logic high)

Register 7: DTMF Decode Control

1 0 0 5 0 *7

- A). DTMF Interdigit Timeout (0.0 sec. - 9.9 sec.) _____
Set long enough to prevent next digit from appearing as a new number sequence
- B). Single Tone Decode Time (0.0 sec - 9.9 sec.) _____
Set long enough to prevent voice talk-off
- C). Repeater Maker Disconnect/Disable _____
 - 0 = allows RM-1 to "disconnect" and terminate its hang time immediately upon acquisition of the disconnect code sequence. A common number can be used for multiple repeaters.
 - 1 = allows the RM-1 to be disabled so that unauthorized users cannot access the repeater. You may want to set the Disconnect/Disable ID number (register 9) to a different or longer number than register 8 (Connect/Access ID).

Register 8: Connect/Access ID

This register prevents unauthorized access. This number will also prevent Morse ID on CTCSS/DCS trigger when Register 3D is set to 1 or 2.

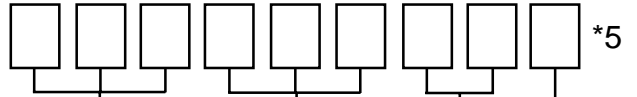
□ □ □ □ □ □ □ □ *8

Register 9: Disconnect/Disable ID

This register can be a disconnect code for Register 8 or a toggle-action enable/disable code and as such Register 8 is ignored.

1 2 3 4 □ □ □ □ *9

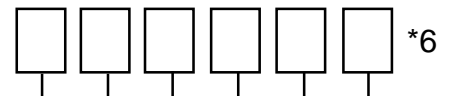
Register 5: PTT Output Control



- A). Repeater Hang Time (seconds) 000-999 seconds (000=off)
- B). Repeater Timeout Timer (seconds) 000-999 seconds (000=off)
- C). Front Porch Keyup Delay (0.0-9.9 seconds)
- D). PTT Output Active Polarity (0=logic low, 1=logic high)

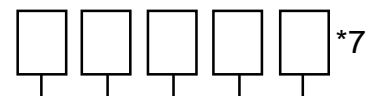
Register 6: Channel Busy Control

All items in register 6 are always active if connected



- A). COR Loss Delay Before ID (0.0-9.9 sec.)
- B). COR Active Polarity (0=logic low, 1=logic high)
- C). Inhibit Loss Delay Before ID (0.0-9.9 sec.)
- D). Inhibit Active Polarity (0=logic low, 1=logic high)

Register 7: DTMF Decode Control



- A). DTMF Interdigit Timeout (0.0 sec. - 9.9 sec.)
Set long enough to prevent next digit from appearing as a new number sequence
- B). Single Tone Decode Time (0.0 sec - 9.9 sec.)
Set long enough to prevent voice talk-off
- C). Repeater Maker Disconnect/Disable
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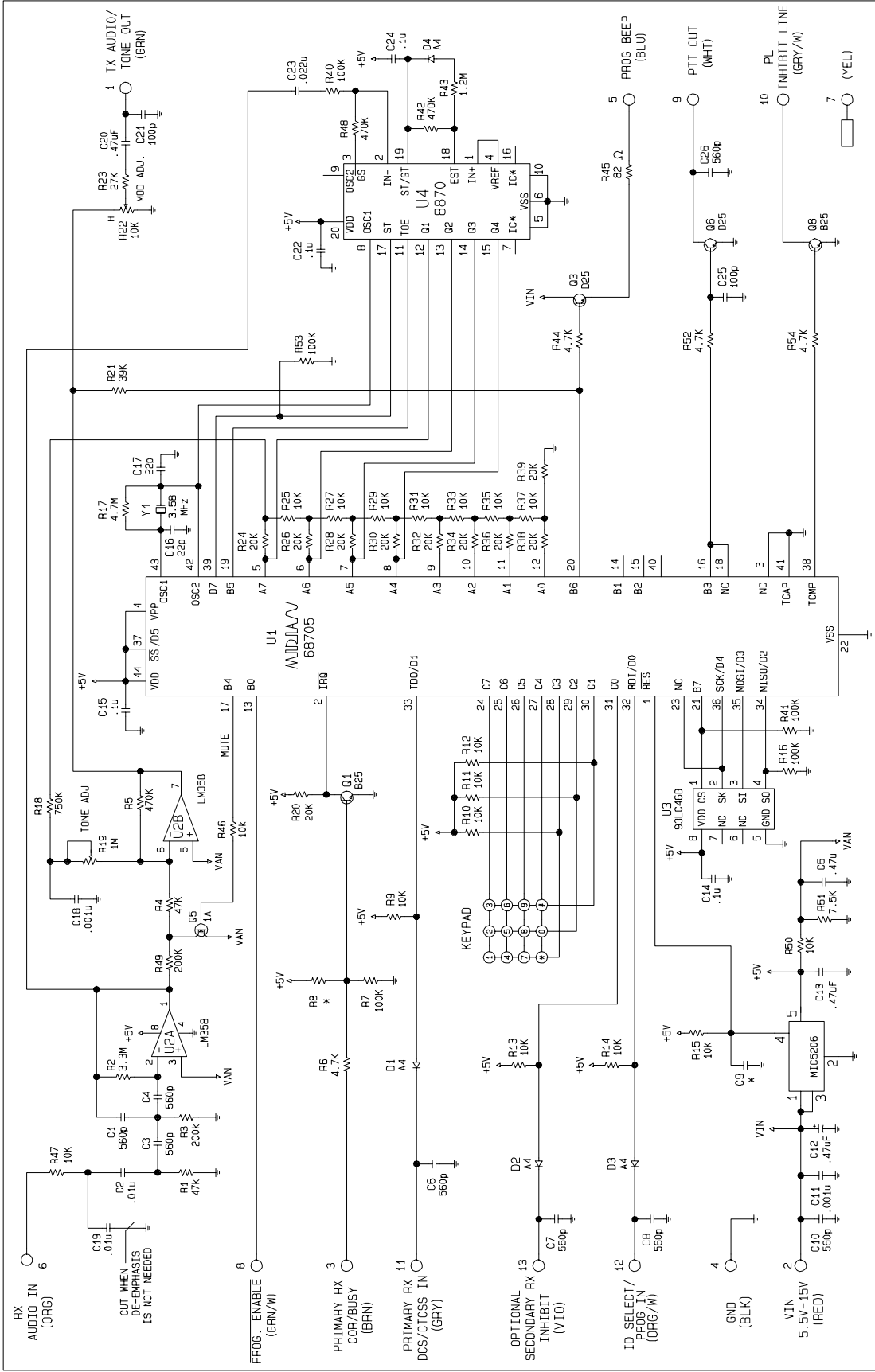


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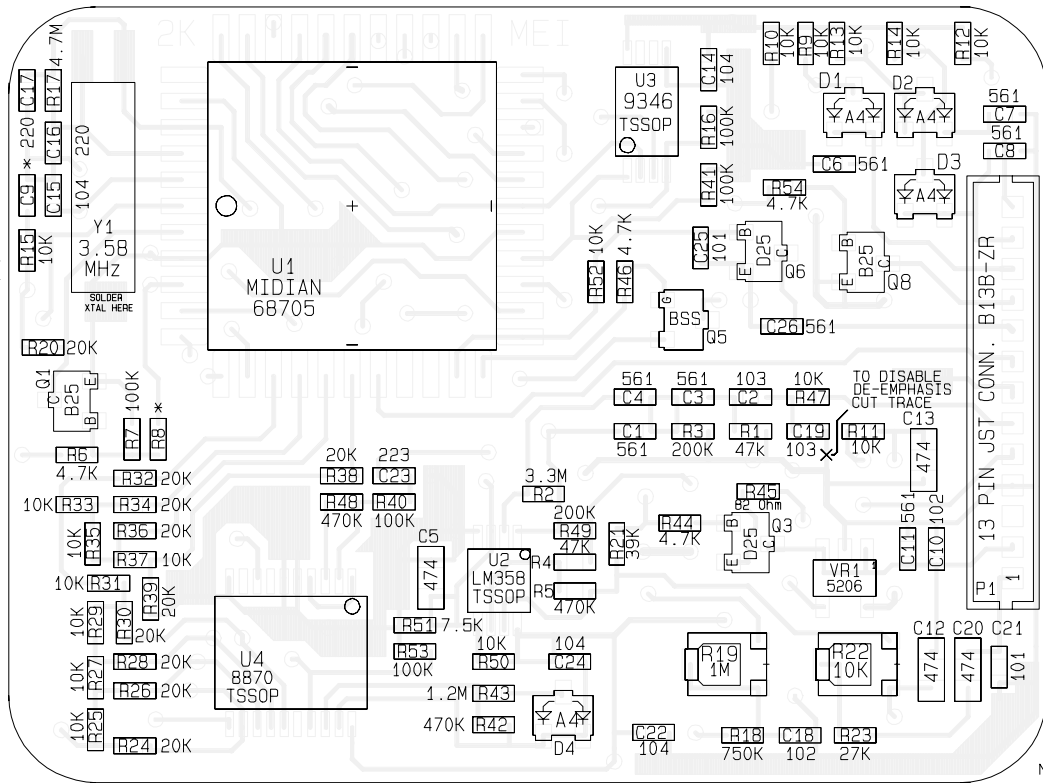


NOTES: * NOT INSTALLED

FILE NO.	315C.SCH
REV.	C
REPEATER MAKER	SCHEMATIC
DWG. NO.	315-HCD
SHEET	
COPYRIGHT ©	2006

MIDIAN ELECTRONICS	MJD1A/V
DATE	JAN 2K
DWN. BY	AB
APPR.	
DESIGN	CJS
REV.	OCT 23/06 AB

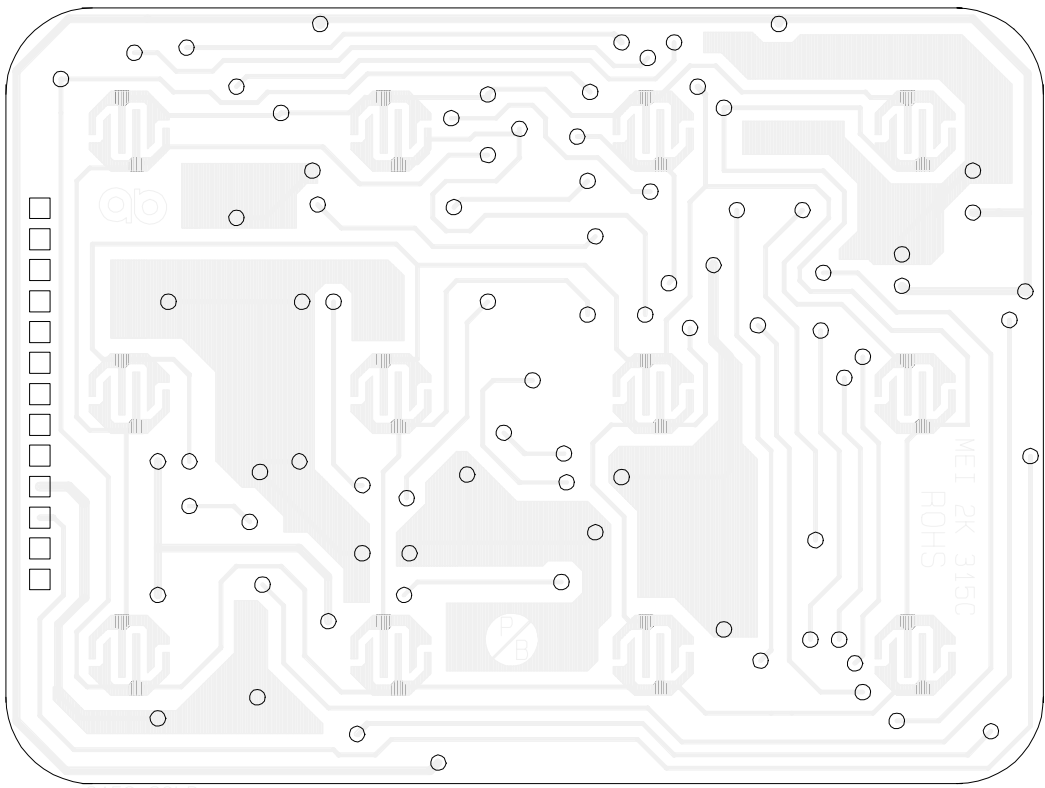
PLACE OVL VERTICAL SD ON BACKSIDE W/ # 1, 2, 3, ... ON THIS END



- OPTIONAL
- SECONDARY RX INHIBIT (V10)
- ID SELECT/ PROG IN (ORG/W)
- PRIMARY RX DCS/CTCS IN (GRAY)
- PL INHIBIT LINE (GRY/W)
- PTT OUT (WHT)
- PROG_ENABLE (GRN/W)
- N/C (YEL)
- RX AUDIO IN (ORG)
- PROG BEEP (BLU)
- GND (BLK)
- PRIMARY RX COR/BUSY (BRN)
- VIN +5.5V-15 (RED)
- TX TONE/AUDIO OUT (GRN)

TO PREVENT SHORTING CUT CONNECTOR LEADS FLUSH BEFORE ADDING KAPTON TAPE STRIP TO CONNECTOR AREA

NOTE: * NOT INSTALLED



MIDIAN ELECTRONICS						REV.	FILE NO.
DATE	JAN 2K	DWN.BY	AB			APPR.	C
DESIGN	CJS	REV.	OCT 23/06	AB	PICTORIAL	SHEET	DWG. NO.
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