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Southern California Microwave

LCD Display 12 Watt Transmitter

Rev. 7-18-01

FCC ID: JR9-VT20SALCD

INTRODUCTION:

The unit is intended for air and ground mobile applications. The frequency band of operation is 1990-2110 MHz and 2450 – 2483.5 MHz with a radio frequency power output of 12 watts max, (10 watts max. optional) and an emission designator of 16M5F8W.

OPERATION:

The units have a 4-button keypad system.



UP and DOWN arrow keys-Press either the up or down keys to scroll through the different menu screens in MENU MODE. They are also for changing values when you are in the EDIT MODE on a screen.

EDIT key -Used to highlight a specific item on a screen, which allows you to change its value. When this key is pressed, you leave MENU MODE and enter EDIT MODE. The item to be edited will blink indicating its value can be changed. You may change its value with the UP or DOWN arrow keys or press the EDIT key again to move to the next item, if there is more than one. You may exit the EDIT MODE at any time by pressing the SAVE key. Any changes made to the screen will be saved. You know you are in MENU MODE when no characters are blinking.

ENTER key-Used to exit EDIT MODE and save changes.

During keypad operation of the unit, you will be in one of two modes- MENU MODE or EDIT MODE.

MENU MODE

Menu mode is the default mode when the unit is powered up. In this mode, using the UP or DOWN keys, you can step through the different screens. All of the current settings of the unit can be seen on these screens. While looking at any screen, if you want to change a setting press the EDIT key. Pressing the EDIT key will cause the unit to leave MENU MODE and go to EDIT MODE.

EDIT MODE

Edit mode is used to make adjustments to the unit. To use the EDIT, first go to the screen you wish to make changes in. Next, press the EDIT key. Part of the screen will now be highlighted. You can change its value by pressing the UP or DOWN arrow keys, or press EDIT again to highlight the next item. To exit EDIT MODE, press the SAVE key. All changes will be saved, and you will return to MENU MODE. Pressing SAVE again will return you to the HOME SCREEN (discussed below).

REMOTE MODE

The unit is always in local mode, unless connected to a remote host. The remote host then has complete control of the unit. It can be controlled through either a RS232 or RS422/RS485 interface set at 9600 baud. Everything that can be done locally can be done remotely, except things that would cause remote communication problems, such as unit address or serial protocol. The maximum recommended distance between the unit and the computer is 50 feet in RS232 mode, and up to 2000 feet in RS422/RS485 mode, although distances longer than those recommended will probably work.

To control a unit remotely, it must be at the home screen (the default screen when it is powered up, after 2 seconds). While the unit is in remote mode, the local keypad is basically disconnected (see detailed description of the REMOTE MODE DELAY SCREEN below). The host computer updates itself to the condition of the unit it is controlling remotely every second, even without user interaction.

ADDITIONAL OPERATING INFORMATION

DANGER!! Do not look directly into the aperture of the transmitting antenna.

The keypad may be locked or unlocked by pressing both the UP and DOWN arrow keys at the same time while at the home screen.

On all screens, the current settings or mode will be displayed when the screen comes on.

On any screen, after you make changes they are saved by pressing the SAVE key once. Pressing the SAVE key again will exit the screen you are in and return you to the home screen. At this point, pressing the UP or DOWN arrow key will take you to the last screen edited.

TRANSMITTER SCREENS

This is a list of the screens you will see in MENU MODE, with a brief description of each. They are in order when scrolling using the DOWN key.

1. Hardware ID Screen – Shown during first 2 seconds upon power up (and is also last menu screen). This screen gives 2 lines of information about the unit- serial number, part number, frequency band, and customer name. There is nothing to edit on this screen.

2. Home Screen – Shown 2 seconds after power up. This screen gives working information about the unit- the frequency band, frequency setting, battery voltage, and case temperature. This screen also will flash the following operational warnings:

LOW BAT – if the battery voltage drops more than about 200 mV below the operating range.

VCO LOCK – flashes once a few seconds after lock is achieved.

VCO UNLOCK – if VCO does not lock or loses lock.

STAND BY – if unit is in standby mode, either because unit has not yet locked, or through keypad setting.

REMOTE – if unit is set in remote operation mode.

LOCKED – if keypad has been locked out.

OVERTEMP – if unit has exceeded normal operating temperature range.

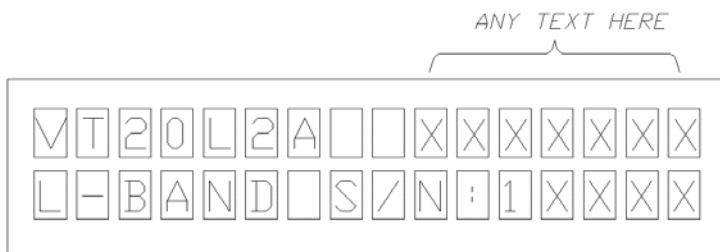
The home screen is the screen you normally have showing while the unit is in operation. It is the screen you return to when exiting EDIT MODE by pressing SAVE twice. Pressing the DOWN or UP arrow key from this screen will take you to either the last screen edited, or the next screen in this list if none have been edited.

3. Frequency Control Screen – Used to change the frequency of the unit.
4. Power Control Screen – Sets the output power of the unit, or puts it in standby mode.
5. Video Level Screen – Allows you to adjust the video level.
6. Video Mode Screen – Sets the video input mode between normal and composite.
7. Audio #1 Control Screen – Allows you to set the subcarrier #1 audio mode and level.
8. Audio #2 Control Screen – Allows you to set the subcarrier #2 audio mode and level.
9. Overtemp Mode Screen – Sets the operation of the transmitter in an over-temp condition.
10. Max Temp Screen – Displays the highest case temperature reached by the transmitter.
11. Backlight Screen – Sets the mode of the screen and keypad illumination.
12. Contrast Screen – Adjusts the contrast of the LCD display.
13. Remote Mode Delay Screen – Sets the amount of time before the unit times out of remote high-speed data mode.
14. Serial Port Protocol Screen – Sets the serial port to RS232 or RS485.
15. Remote Address Screen – Allows you to set the units RS485 address to one of 256 possible.
16. Remote Port Screen- Turns the remote port on and off.

DETAILED SCREEN DESCRIPTION:

HARDWARE ID SCREEN

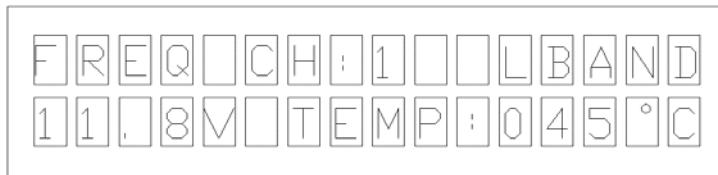
Upon initial powering up of unit, this screen will be displayed for 2 seconds:



This screen displays information about the unit, such as software Rev, serial number, customer information, etc. There is nothing to edit on the screen. This screen can also be accessed in menu mode.

HOME SCREEN

Two seconds after initial powering up of unit, or after two save commands, this screen will be displayed:



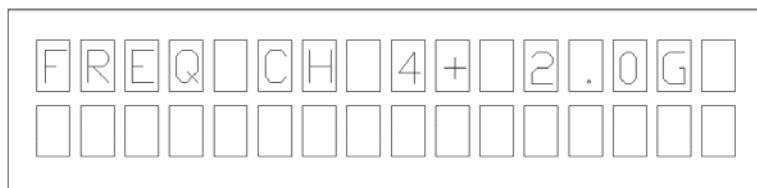
This screen displays the frequency band and current frequency setting on the top line. On the bottom line, the battery voltage and case temperature are displayed. Any warnings will flash across the bottom line of the display as well. This screen is for information only, and has no edit mode. The home screen is the screen you normally have showing while the unit is in operation.

KEYPAD LOCK FUNCTION

In this screen only, the keypad can be locked or unlocked by pressing the UP and DOWN arrow keys at the same time. Locking out the keypad will eliminate any changes to the unit due to accidental contact with the keys.

FREQUENCY SCREEN

This screen is used to set the output frequency of your transmitter.



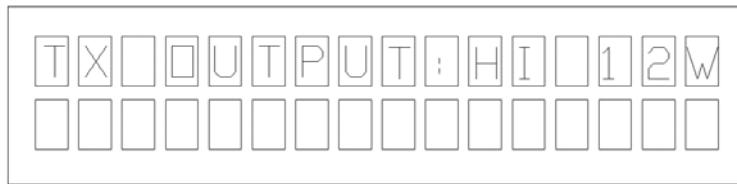
When the EDIT key is pressed, the numerical portion of the frequency will blink, and will increment or decrement each time the UP or DOWN arrow is pressed. The frequency band will carry over to the next highest or lowest, if available. On the frequency screen the numbers will increase or decrease to the upper or lower channel, then cycle around.

The output signal is limited to the 1990 (min) to 2110 (max) MHz and 2450 (min) to 2483.5 (max) MHz bands.

Once the desired frequency has been selected using the UP and DOWN arrow keys, the unit will not actually go to the new frequency until SAVE is pressed.

POWER CONTROL SCREEN

This screen sets the output power of the transmitter.

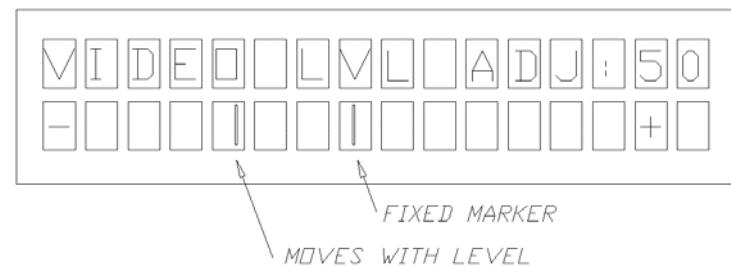


The current mode will be displayed. To change the setting, press the EDIT key, then the UP or DOWN arrow keys until the desired setting is shown, then press SAVE. You can select between high power, low power, or standby.

STANDBY

In standby, the RF output of the unit will be down anywhere from 65 to 80 dB from the “on” modes. The unit will not go the desired setting until SAVE is pressed. If the unit is put into standby mode, a stand by warning will be shown on the home screen.

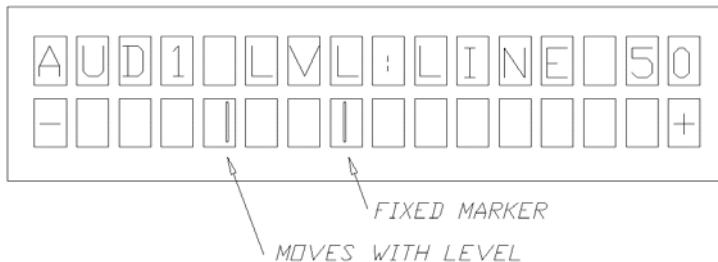
VIDEO LEVEL SCREEN



To adjust the video level, press the EDIT key, then the UP or DOWN arrow keys. The actual video level will change *as* the numbers change on the screen. There is about 10dB of adjustment, in about .3 dB increments. When the desired video level is reached, press the SAVE key to save the video level. Each channel has it's own video level that will be saved for that channel only. There is a fixed reference marker which is set at the 1V p-p video level, so you can return the unit back to it's original setting if desired.

AUDIO LEVEL SCREENS

This screen is used to set the audio mode, and adjust the audio level:



The current audio mode and audio level of the subcarrier is shown- Mic, Line, or Off (or None if there is no subcarrier). Press the EDIT key once, then the UP or DOWN arrow keys to adjust the audio level in the current mode. Pressing the EDIT key again, then use the UP or DOWN arrow keys to change the mode from mic to line. The actual audio levels and modes change *as* you select them on the display. As with the video screen, there are reference markers so you can bring the transmitter back to the factory settings.

MIC MODE

The audio input levels are from about -56 to -15 dBm in mic mode. It is adjustable in increments between .5 and 1 dB. Holding the UP or DOWN arrow keys will auto-increment the level adjust. Normally, when a subcarrier is in mic mode, its input is single-ended with a 2.7k input impedance. However, this is also available balanced, with impedances as required by the customer. Keep in mind that the impedance will be the same between mic and line mode if balanced input is required in both modes.

LINE MODE

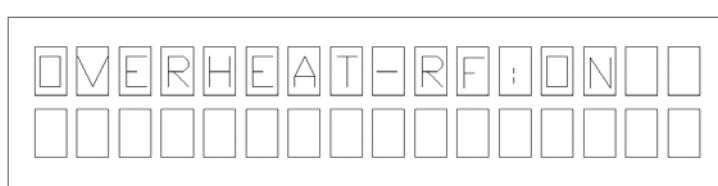
The audio input levels are from about -20 to +10 dBm in line mode. It is adjustable in increments between .5 and 1 dB. Line level input is balanced, with 600 ohm input impedance standard, others available.

VIDEO TRAPS

All audios have corresponding traps at the subcarrier frequencies in the video circuit to improve the audio quality. When an audio subcarrier is turned off, its trap is removed from the video circuit. With both subcarriers off, the video response will be out to about 10 MHz.

OVERTEMP RF ON/OFF SCREEN

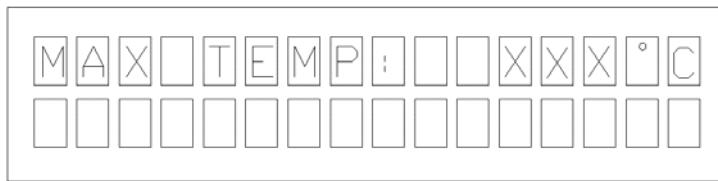
This is a transmitter only screen.



This screen sets the operating mode of the transmitter in an overtemp condition. To set, press the EDIT key, then the UP or DOWN arrow keys to select the desired mode, then press SAVE. If it is set to STBY, the transmitter will go to standby when the case temperature reaches a set point, typically 5 degrees over the normal maximum operating temperature. In standby the transmitter current draw will be minimal, allowing the unit to cool down. When the unit has cooled down to its normal operating temperature range, about 5 degrees below the turn-off temperature, it will come back on at its previous power level.

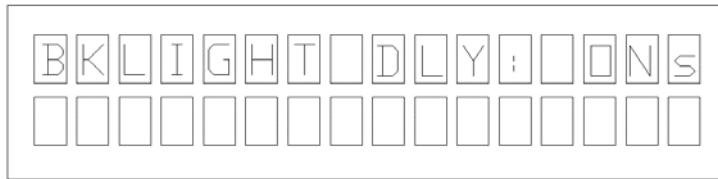
If the overtemp mode is set to ON, the transmitter will stay on, no matter what temperature is reached. However, the unit may be permanently damaged due to excessive heat and may require expensive repair. Use of this mode is not recommended.

MAXIMUM TEMPERATURE SCREEN



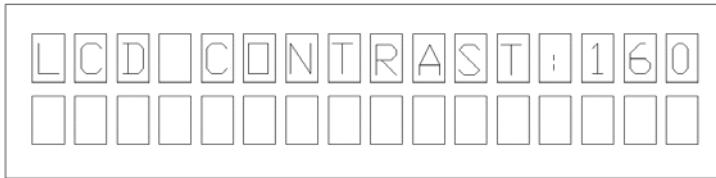
This screen displays the maximum case temperature reached by the transmitter since it was last cleared. To clear, press the EDIT key, then press the DOWN arrow key. The display will stay at "00" until you press SAVE twice, and return to the home screen.

BACKLIGHT SCREEN



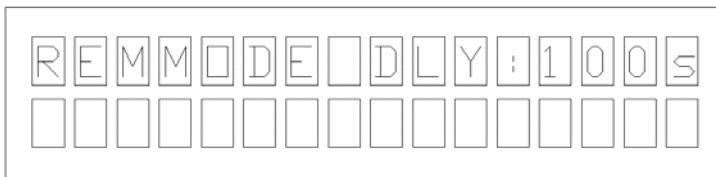
This screen controls the LCD and keypad backlighting. It can be set to always be on, always be off, or stay on for a user-set number of seconds, up to 998, after the last entry into the keypad. The current mode will be shown. To set, press the EDIT key, then the UP or DOWN arrow keys until the desired setting is reached, then press SAVE. "ON" and "OFF" are between 998 and 001 seconds. Be aware that the backlighting draws about 70 mA. If optimum current draw is a factor, it should be left off, or set to turn off soon after keypad changes are through.

LCD CONTRAST SCREEN



The user can adjust the LCD contrast voltage, from very light to very dark. The contrast voltage has a temperature compensation circuit built into it, so it will always be easily seen at any temperature and should never need to be adjusted. However, if desired, the contrast voltage can be adjusted for optimum viewing. To adjust, press the EDIT key, then use the UP or DOWN arrow keys. Increasing numbers make the display darker.

REMOTE MODE DELAY SCREEN



This screen sets the amount of time before the unit releases itself from remote mode. When the unit is controlled by a remote host computer, the local keypad is basically disconnected. This allows the data to be exchanged between the unit and the computer at the maximum speed. Normally, the host computer releases the unit from remote mode through the software. However, in case of a glitch on the computer end, or the cable between the unit and the computer is accidentally disconnected, you can set the amount of time before the unit releases itself from remote mode with this screen. It is adjustable from 001 to 998 seconds, as well as ON or OFF. ON and OFF are located between 998 and 001.

ON MODE

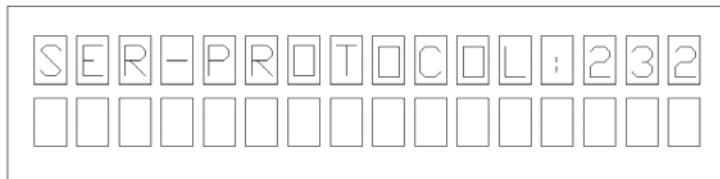
In ON mode, the unit never goes back to local mode without software release.

OFF MODE

In OFF mode, the local keypad inputs will be seen, and will also have some control of the unit. As soon as the unit is taken out of the HOME SCREEN with the local keypad, even if it is in remote, local commands will have precedence over remote commands. Any remote changes will not be executed until the unit is returned to the HOME SCREEN through the local keypad.

With the time set to any number of seconds, the local keypad will never be seen as long as the unit is still connected to the host computer.

SERIAL PORT PROTOCOL

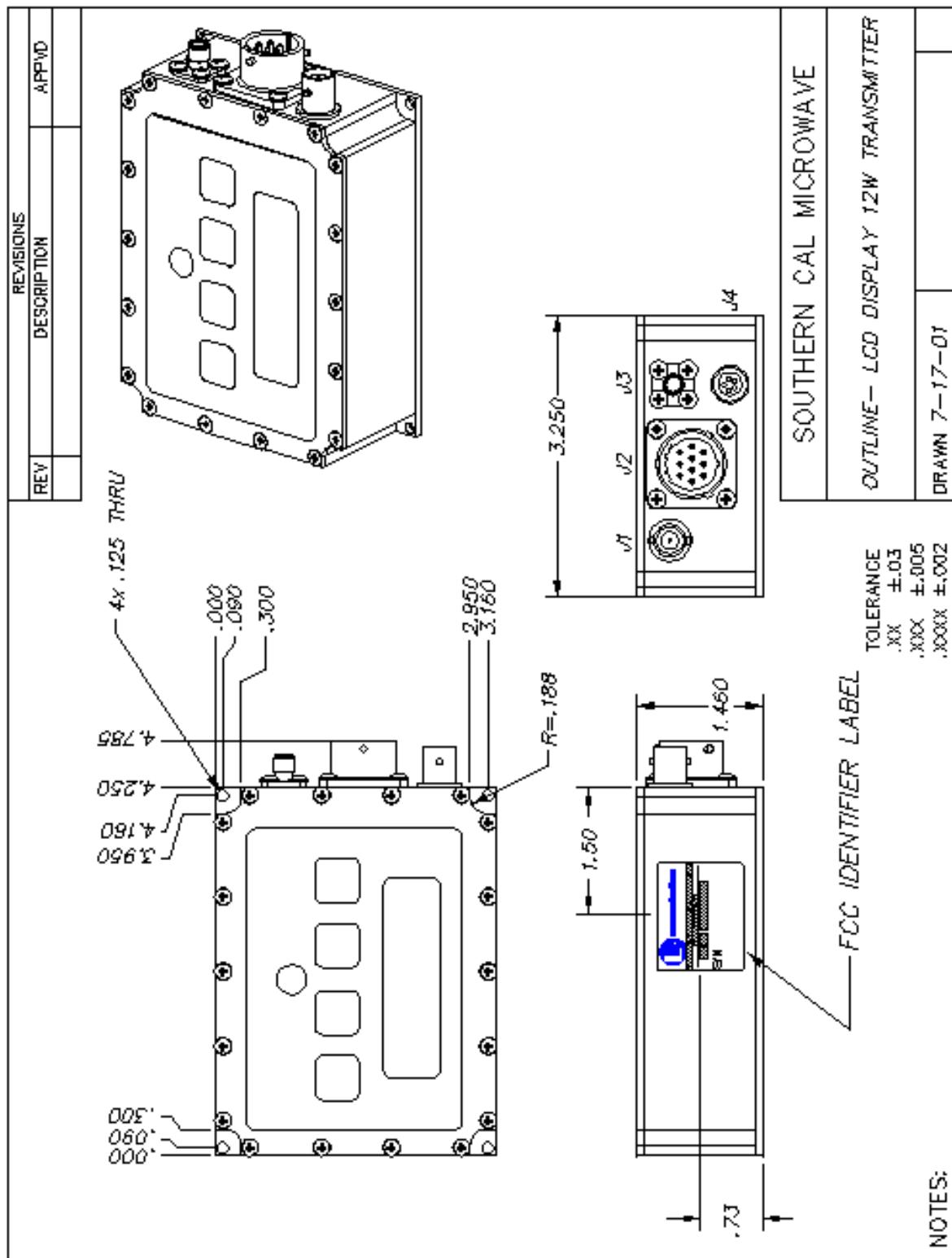


This screen controls the remote interface protocol. It is selectable between RS232 and RS422 (or RS485). The current mode will be shown. To set, press the EDIT key, then the UP or DOWN arrow keys until the desired setting is reached, then press SAVE.

REMOTE ADDRESS



This screen sets the units individual remote address. The remote address is used only when controlling a unit remotely. Any unit can be set by this menu to any address between 000 and 256. The remote software looks at each units address, and will only communicate with the address specified in the remote unit. In RS422 or RS485 mode, you can set each unit to a different address, and connect multiple units to the same control cable. The current address will be shown. To set, press the EDIT key, then the UP or DOWN arrow keys until the desired setting is reached, then press SAVE.



OUTLINE OF TRANSMITTER

