

MAGNUM**1**

AM/FM/SSB/CW 12 & 10 METER
MOBILE AMATEUR TRANSCEIVER

OWNER'S MANUAL

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LIMITED WARRANTY

RF Limited warrants this product to be free of defects for a period of one (1) year from the original date of purchase. This warranty is non-transferable. This limited warranty is subject to repair or replacement of defective components only. This warranty is void if the radio has been tampered with or misused.

IMPORTANT: RETAIN YOUR SALES RECEIPT

The enclosed warranty registration form must be filled out and mailed along with a photocopy of your sales receipt within 30 days from the purchase date. If the warranty registration form and copy of your sales receipt are not received the radio is not covered under warranty. Please fill out the enclosed warranty registration form and send it along with a copy of your sales receipt to:

RF Limited
PO Box 1997
Gig Harbor WA 98335

Registering your MAGNUM 1 with Magnum validates your warranty and entitles you to free updates and information regarding your radio and new accessories for your radio.

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INTRODUCTION

Thank you for purchase of the MAGNUM 1 AM/FM/SSB/CW 12 and 10 meter amateur transceiver. Your MAGNUM 1 is designed to provide years of enjoyment and trouble-free service. There are many features and functions designed into this transceiver. To ensure that your investment is enjoyed to its fullest extent please take a few moments and thoroughly read this manual.

Your MAGNUM 1 is a microprocessor controlled, user programmable radio combining both high RF performance with a user-friendly environment. The MAGNUM 1 is built rugged to withstand years of use in harsh mobile environments. Although engineered with mobile use in mind the MAGNUM 1, with the addition of a high quality 20 amp regulated power supply, may be easily adapted to fixed station operation.

Some of the features of the MAGNUM 1 are; an advanced design liquid crystal display that provides the operator with a full visual account of the transceiver's operating status, automatic frequency scanning from either the front panel or microphone, programmable frequency resolution of from 5 Hz through 1MHz, and coverage of both the 12 and 10 meter amateur bands.

IMPORTANT: The MAGNUM 1 is designed for entry level amateur use. If the transmitter is operated in the United States or within it's territories a licensed amateur radio operator must be present at the station. The minimum license class to transmit on the 12 meter band is General class. To transmit on the 10 meter it is Technician class. If you are studying for your license and want to familiarize yourself with the operation of the radio, the receiver may be operated with or without a licensed operator present. For more information regarding FCC licensing, contact the nearest amateur radio dealer, or for complete details contact the American Radio Relay League.

American Radio Relay League (ARRL)
225 Main Street
Newington CT 06111

Telephone 860-594-0200
Facsimile 860-594-0259
hq@arrl.org
<http://www.arrl.org>

INSTALLATION

1. Contents

Unpack and inspect your Magnum 1 for missing or damaged components. Your MAGNUM 1 includes the following items:

Quantity	Description
1	MAGNUM 1 Transceiver
1	Stock Microphone
1	DC Power Cord with Inline Fuse
1	Mounting Bracket with Hardware
1	Microphone Hanger with Hardware Set
1	Operating Manual with Schematic
1	Warranty Registration Form

2. Microphone Hanger

The microphone hanger comes with mounting screws and may be attached to any convenient location.

3. Mounting

When attaching the MAGNUM 1 mounting bracket to the vehicle, choose a location that will provide easy access to all front panel controls and air circulation to the rear panel. When selecting a mounting location, make sure that there is ample space behind the unit for the cables. Do not pinch, or bend sharply, the power or antenna cables. Do not install the MAGNUM 1 in any compartment that restricts airflow and do not install in a location that interferes with the safe operation of the vehicle.

Attach the mounting bracket to the vehicle first then mount the MAGNUM 1 to the bracket. If the rear panel is not accessible you may want to attach the power and antenna cable prior to mounting.

4. Electrical Connections

The MAGNUM 1 is designed to work on any 12 - 13.8 volt DC, negative ground, source. The condition of a vehicle's electrical system can affect operation. A low battery, worn generator/alternator, or poor voltage regulator will seriously impair the performance of the transceiver. Any of the above conditions could result in a high level of receiver noise generation or a substantial loss of the transmitter's RF output. Make sure that all of these components of your vehicle's electrical system are in good condition prior to installing the transceiver.

CAUTION!

VOLTAGE EXCEEDING 16 VDC WILL DAMAGE THE RADIO. MEASURE VOLTAGE AT BATTERY TERMINALS, WITH VEHICLE RUNNING, PRIOR TO INSTALLATION!

Before making any electrical connections make sure the volume (VOL) control is in the "OFF" position. Connect the positive (+) red wire of the DC power cord to a positive 13.8 volt source at the vehicle fuse block. If connecting to the fuse block, it is recommended that a switched power source is used

so that the power to the transceiver is disconnected when the vehicle is off. This will eliminate the possibility of the transceiver draining the vehicle's battery.

Connect the negative (-) black wire to a metal part of the vehicle's frame, or chassis ground. Make sure that this is a good ground connection.

The MAGNUM 1 power cord may also be connected directly to the battery. Connecting directly to the battery has several benefits, the first of which is to maximize RF output. Secondly, the battery is a very large capacitor and will help eliminate certain types of ambient and vehicle noise. If connecting directly to the vehicle's battery, additional power cable may be required. On runs of 8 feet or less use 12-gauge stranded wire. Use 10-gauge wire on longer runs.

5. Antenna Connection

The transceiver will operate using any standard 50-ohm ground-plane, vertical, mobile whip, long wire or similar antenna. The antenna should be rated at 100 watts PEP minimum. A standard SO-239 type antenna connector is located on the rear panel of the MAGNUM 1. Connection is made using a PL-259 and high-grade coaxial cable (RG213, RG58A/U or Mini RG-8 is recommended).

A ground-plane antenna provides greater coverage and is recommended for fixed station-to-mobile operation. For point-to-point fixed station operation, a directional beam antenna operates at greater distances even under adverse conditions. A non-directional antenna should be used in a mobile installation; a vertical whip is best suited for this purpose. The base loaded whip antenna normally provides effective communications. For greater range and more reliable operation, a full quarter wave whip may be used. Either of these antennas uses the metal vehicle body as a ground plane.

Once the antenna is mounted on the vehicle, route the coaxial cable so that it is not next to any power cables or vehicle cables. Connect the PL-259 to the antenna connector on the rear panel of the MAGNUM 1. Make sure that the cable does not interfere with the safe operation of the vehicle.

6. VSWR

Before use, it is important to determine the antenna system's VSWR (voltage standing wave ratio). You will need a high quality SWR bridge (meter) to accurately tune your antenna system. First, make sure the SWR bridge is in good working order and is calibrated. To ensure your radio is performing properly the VSWR should never exceed 1.5 to 1. Never transmit on any antenna system where the VSWR exceeds 1.8 to 1. This will stress the output stage and could destroy the RF transistors; this type of misuse and failure is not covered under warranty.

Measure the VSWR at the center of the operating band. Tune the antenna (according to the antenna manufacturer's tuning instructions) so that the VSWR is as close to 1 to 1 at the center of the operating band.

Next, measure the VSWR at the lowest and highest frequency of the transceiver. If the antenna has a wide enough frequency range and band-pass, the VSWR readings should be below 1.5 to 1 across the entire operating band. If at the lower or upper end of the transceiver operating frequency, the VSWR measures more than 1.5 to 1, it is recommended that the antenna be re-tuned before operating on those frequencies.

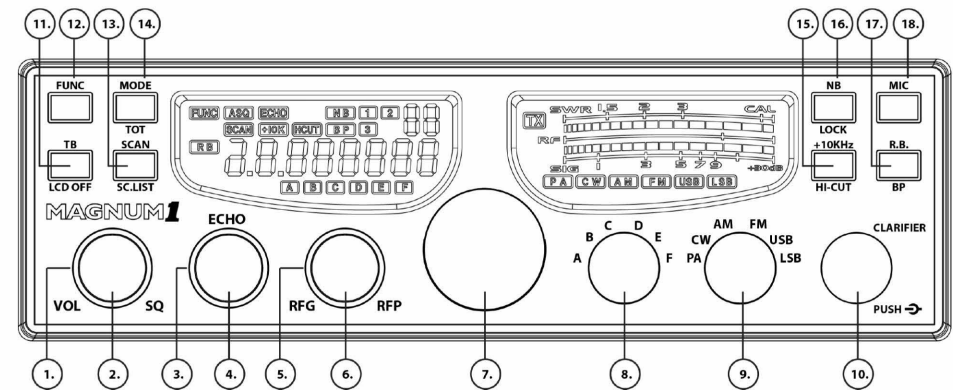
If you are experiencing unusual VSWR readings check for the following possible problems:

- 1) Make sure that the antenna is installed properly and grounded.
- 2) Check all coaxial cable and connectors for defects and poor routing.
- 3) If testing a vehicle installation, make sure that all vehicle doors are closed when testing.
- 4) Do not test near or around large metal objects or buildings.

7. Ignition Noise

In certain vehicle installations, electrical noise or interference may be present in the receive audio of the transceiver. Typically the vehicle's ignition system or more specifically the alternator generates this noise. The MAGNUM 1 is equipped with a noise blanker circuit that is designed to reduce, and in many instances eliminate, this electrical noise.

In extreme cases, the noise blanker may not eliminate all the electrical noise. In such cases, an alternator / ignition noise filter can be used. The XLF Series by RF Limited is designed for use with the MAGNUM 1 and is an effective way to eliminate alternator and ignition noise problems. Contact RF Limited or your local dealer for information.



FRONT PANEL CONTROLS

1. SQUELCH

Used to eliminate background or "white" noise when monitoring strong signals. To properly adjust the squelch circuit, start rotating the control slowly clockwise until the received white noise disappears.

2. VOLUME (OFF)

(OFF): Turns the radio on and off. To turn the radio off rotate the control counterclockwise until it clicks.

VOLUME: Adjusts the AF gain, or volume of the receive audio. Turn clockwise to increase and counterclockwise to decrease.

3. ECHO DELAY

Varies the amount of delay, or duration of the echo repetition. Rotate clockwise to increase the amount of delay and counterclockwise to decrease.

4. ECHO VOLUME (OFF)

(OFF): Turns the echo feature on and off. To turn the echo off rotate the control counterclockwise until it clicks.

VOLUME: Varies the volume or number of echo repetitions. To increase the echo volume, rotate the control clockwise.

5. RF GAIN

Adjusts the receiver sensitivity to both signals and background noise. This affects the distance at which a signal can be detected. Turning the control counterclockwise reduces the receiver sensitivity. This is particularly useful in areas where large volumes of signals are present. The S/R/F display ("SIG" bar) indicates the received signal's strength.

6. RF POWER

The transmitted power of the MAGNUM 1 may be varied from 0 to 40 watts peak in all modes. Rotate clockwise to increase RF output power. Rotate counterclockwise to decrease RF output power.

7. **FREQUENCY:** Rotate clockwise or counterclockwise to select the desired frequency. To change frequency step see 10. Clarifier.

8. BAND (A~F)

Band control positions A ~ F splits the radio frequency range into smaller sections for quicker tuning across the radio's frequency range.

- A: 24.890 ~ 24.990 MHz (12 Meter Band)
- B: 28.000 ~ 28.395 MHz (10 Meter Band)
- C: 28.400 ~ 28.795 MHz (10 Meter Band)
- D: 28.800 ~ 29.195 MHz (10 Meter Band)
- E: 29.200 ~ 29.595 MHz (10 Meter Band)
- F: 29.600 ~ 29.700 MHz (10 Meter Band)

9. OPERATING MODE

The operating mode switch allows selection of PA, CW, AM, FM, USB and LSB modes.

PA, or Public Address, mode allows the user to transmit their voice over a loudspeaker (PA horn) when connected to the transceiver. To use this feature, connect a PA horn to the external speaker jack on the back panel. Refer to Menu Settings section for additional PA features.

CW, or Continuous Wave, is for Morse Code communications. To operate Morse Code a CW key, or paddle, is connected to the CW Key jack on the back panel of the transceiver. Refer to Menu Settings section for additional CW features.

10. CLARIFIER

The clarifier is used to adjust the operating frequency for tuning to an SSB signal. The clarifier has 3 operating modes: receive only; receive and transmit (default setting); transmit only. Refer to MENU SETTING section for details on setting the clarifier modes.

To adjust the frequency rotate the clarifier clockwise or counter-clockwise. To change the frequency step push in the clarifier control. The current frequency step position with blink on the LCD. To increase to the next frequency step position, push in the clarifier again while the current position is blinking. Repeat until desired frequency step position is achieved.

Note: The entire operating frequency range of the transceiver can be tuned using the clarifier. This is similar to a VFO style frequency tuning.

11. TALK BACK / LCD OFF

Talk Back (TB) allows for monitoring of the operator's transmitted audio. To adjust the talk back, press the TB button. "tb" will appear on the LCD along with the volume level number (off ~ 63). Rotate the Frequency control (7) to adjust talk back volume. Press talk back button again to return to main display.

LCD OFF turns the LCD display off for situations where you want the radio to remain on, but do not want the LCD display to be visible. To turn off the LCD, press FUNC button and then press LCD OFF button. To turn the LCD back on, repeat process.

12. FUNC (MENU)

The FUNC button is used to operate secondary controls on the front panel buttons and is used to access the radio's menu feature.

To operate front panel button secondary controls press and release the FUNC button. "FUNC" will appear on the LCD for approx. 5 seconds during which the secondary front panel controls may be accessed.

To enter the menu setting, press and hold the FUNC button for 3 seconds. To exit the menu setting, repeat. For more information on menu settings, see MENU SETTINGS section.

13. SCAN / SC.LIST

When the scan feature is activated the radio will scan through the current frequency band in 5kHz steps and automatically stop on a busy frequency. To start scan, press the SCAN button. To stop the scan, repeat.

The scan feature has 2 menu settings: Stop on Signal Scanning (Sq) and Timed Stop Scanning (Ti). The Stop on Signal Scanning (default setting) automatically stops on a busy frequency and then resumes scanning when signal is no longer detected.

The Timed Stop Scanning automatically stops on a busy frequency for 5 seconds and then resumes scanning regardless of signal being detected or not. See MENU SETTING section for details.

The SC.LIST feature allows the operator to ignore (skip over) specific frequencies from the scan list. Use the frequency control to select the frequency to skip over. Press and release the FUNC button, and then press and release the SC.LIST button. An indicator dot (period) will appear on the LCD between the 10MHz and 1MHz frequency positions. This frequency will now be skipped during scanning. To no longer skip over that frequency, repeat the steps above.

14. MODE / TOT

During transmit the radio's LCD can display frequency (default setting), time-out transmit counter, or battery voltage. To change the LCD setting, press the MODE button to step through the 3 display options as follows:

"td tF" = Frequency displayed during transmit

"td bat" = Battery voltage displayed during transmit

"td tot" = Time-out transmit counter displayed during transmit

The Time-Out Transmit (TOT) feature sets a maximum time limit that the radio will transmit. This feature prevents accidental long term transmitting that would eventually damage the radio. To turn the Time-Out Transmit feature on, press and release the FUNC button and then press and release the TOT button. To turn off the feature, repeat above steps. The LCD will display either "tot on" or "tot of".

The amount of transmit time allowed is adjustable from 0 to 600 seconds in 30 second increments. The time is adjusted through the MENU SETTING. See MENU SETTING section for details.

15. +10KHz / HI-CUT

The +10KHz button is a shortcut control that increases the current operating frequency by 10KHz when pushed. Push the button again to decrease by 10KHz and return to original operating frequency.

The HI-CUT feature is a receive audio bandpass filter that clips the high frequency noise. To turn on press the FUNC button and then press the HI-CUT button. HI-CUT will appear on the LCD and you will hear a difference in the receive audio sound. To turn off, repeat.

16. NB & ANL / LOCK

The NB button turns on and off the radio's noise blanker and automatic noise limiter features. The noise blanker can help reduce some types of noise emitting from the vehicle or power source. The automatic noise limiter

17. R.B. / BP

The R.B. button turns on and off the radio's roger beep, or end of transmission tone. To turn on, press the R.B. button and RB will appear on the LCD. To turn off, repeat.

Both roger beep tone and duration are adjustable to create a custom sounding roger beep tone. See the rb and rt sections under Menu Settings.

The BP button turns on and off the radio's control beep tone. This is an audible tone that heard when a control is changed. To turn on the beep tone, press the FUNC button and then press the BP button. BP will appear on the LCD. To turn off, repeat.

The beep tone volume is adjustable through the radio's Menu Settings. See bE section of Menu Settings for details.

18. MIC

The MIC button is a shortcut button to the radio's microphone gain control. To adjust the microphone gain control, press the MIC button and rotate the frequency control knob. The microphone gain can be adjusted from off to 63 (100%) with the factory default setting being 31.

MICROPHONE

1. PUSH TO TALK (PTT) BUTTON

Press and hold the switch to transmit. TX will appear on the LCD screen when transmitting. Release the switch to receive.

For best audio when transmitting, hold microphone approximately ½" to 1" away from your mouth and speak in a normal level voice directly into the middle of the microphone front grill.

2. UP and DOWN FREQUENCY BUTTONS

Allows remote operation of the frequency control. Press the UP button to increase the operating frequency and the DN button to decrease.

3. ASQ BUTTON

The ASQ button turns on and off the automatic squelch feature. Press the ASQ button and ASQ will appear on the LCD screen indicating that the automatic squelch feature is turned on. To turn off, repeat.

4. MICROPHONE PINOUT

A 6-pin, lock ring type, microphone connector is used. Microphone wiring is as follows:

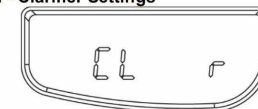
- Pin 1 : Microphone Audio
- Pin 2 : Receive
- Pin 3 : Transmit
- Pin 4 : Up/Down Freq. (see schematic)
- Pin 5 : Ground
- Pin 6 : +13.8 VDC

MENU SETTINGS

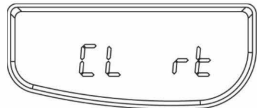
To access the radio's menu settings, press and hold the FUNC for 3 seconds. The LCD will display the menu selection and current setting. To change menu selection, rotate the clarifier knob. To adjust the setting of a menu selection, adjust the frequency knob. To save settings and return to main screen, press and hold FUNC for 3 seconds. If no action is taken for 10 seconds the settings will be saved and the radio will revert back to the main screen.

Below are the available menu selections and setting details for each menu.

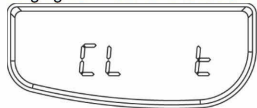
CL Menu - Clarifier Settings



CL r - The clarifier adjusts receive frequency only. On main screen, when adjusting the clarifier a "r" will appear on LCD indicating that clarifier is in receive only mode.

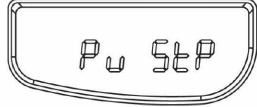


CL rt – Default Setting. The clarifier adjusts both receive and transmit frequency. On main screen, when adjusting the clarifier a “2” will appear on LCD indicating that clarifier is changing both receive and transmit frequency.

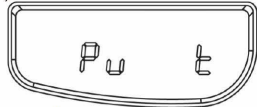


CL t – The clarifier adjusts transmit frequency only. On main screen, when adjusting the clarifier a “3” will appear on LCD indicating that clarifier is in transmit only mode.

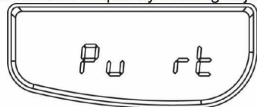
Pu Menu – Clarifier Push Button Settings



Pu StP – Default Setting. The clarifier push button function controls the clarifier frequency step. Refer to Clarifier (10) instructions for details.

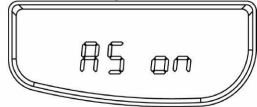


Pu t – The clarifier push button temporarily switches clarifier to transmit-only mode, from whatever mode is selected in the clarifier (CL) menu. While in transmit-only mode a “3” will appear on LCD indicating to the operator that only the transmit frequency is being adjusted.



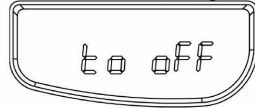
Pu rt – The clarifier push button temporarily switches clarifier to receive and transmit mode, from whatever mode is selected in the clarifier (CL) menu. While in receive and transmit mode a “2” will appear on LCD indicating to the operator that both the receive and transmit frequency is being adjusted.

AS Menu – Automatic Squelch Control Settings



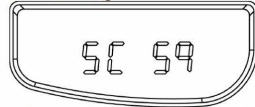
AS on/off – Default Setting is OFF. This turns on and off the automatic squelch (ASQ) feature. When the ASQ is ON, the radio automatically monitors and adjusts the squelch setting so that white noise is not heard. The ASQ can also be turned on and off from the middle button on the microphone.

to Menu – Time-Out Transmit Settings



to off / 30-600 – Default Setting is 180. This setting adjusts the duration, in seconds, of the time-out transmit timer feature. The setting range is from 0 (off) to 600 seconds in 30 second increments. See 14. in Front Panel Control section for more details.

SC Menu – Scan Settings

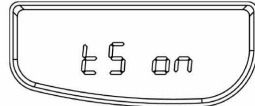


SC Sq / ti – Default Setting is Sq. The Sq and ti scan settings allows you to select whether the radio stays on a busy channel indefinitely during scanning or only for a fixed period of time. When set to Sq (squelch) the radio will scan to the next busy channel with an incoming signal and remain on that channel until the incoming signal is gone.

When set to ti (time) the radio will scan to the next busy channel with an incoming signal and remain on that channel for 5 seconds and then resume scanning – regardless of whether the channel is busy or not.

See 13. in Front Panel Control section for more details.

tS Menu – Transmit SWR Protection Setting

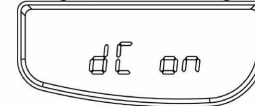


tS on/off – Default Setting is ON. The transmit standing wave ratio (SWR) protection circuit protects the radio from accidental transmitting on SWR's of 10:1 or higher.

When set to on, the radio will automatically monitor the antenna SWR and prohibit transmitting if the SWR is 10:1 or higher.

When set to off, the protection circuit is disabled and the radio will transmit on SWR's of 20:1 or less.

dC Menu – Voltage Protection Setting

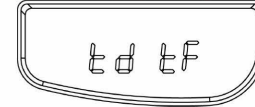


dC on/off – Default Setting is ON. The power supply voltage protection circuit protects the radio from input voltages that are outside of the safe operating range of 10.5 to 16 volts DC.

When set to on, the radio will monitor the supply voltage from the vehicle or power supply. If the supply voltage drops below 10.5 volts DC or rises above 16 volts DC the radio will display a warning and prohibit transmitting.

When set to off, the protection circuit is disabled.

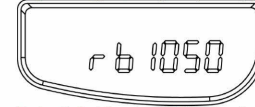
td Menu – Transmit Display Setting



td Menu – Default Setting is tF. During transmit the radio's LCD can display frequency (default setting), time-out transmit counter, or battery voltage. This feature is also controlled by the MODE button on the front panel.

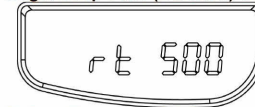
“td tF” = Frequency displayed during TX
 “td bat” = Battery voltage displayed during TX
 “td tot” = Time-out transmit counter displayed during TX

rb Menu – Roger Beep Tone (Frequency) Setting



rb Menu – Default Setting is 1050. The frequency (Hz), or tone, of the radio's roger beep is adjustable between 300Hz ~ 3000Hz in 10Hz steps. Use the radio's talk back monitor (TB) to determine the desired roger beep sound.

rt Menu – Roger Beep Time (Duration) Setting



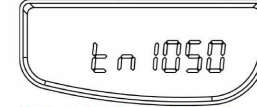
rt Menu – Default Setting is 1050. The time, or duration, of the radio's roger beep tone is adjustable between 50ms ~ 1000ms in 50ms steps. Use the radio's talk back monitor (TB) to determine the desired roger beep duration.

CF Menu – CW Side Tone Frequency Setting



CF Menu – Default Setting is 1050. The frequency (Hz), or pitch, of the radio's CW side tone is adjustable between 300Hz ~ 3000Hz in 10Hz steps.

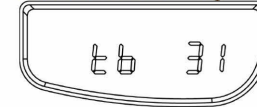
tn Menu – Transmit Single Tone Frequency Setting



tn Menu – Default Setting is 1050. The radio has the ability to transmit a single tone signal to provide a continuous tone for the receiving radio to tune to. Use the tn menu to adjust the tone, or frequency (Hz), between 300Hz ~ 3000Hz in 10Hz steps.

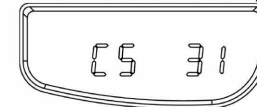
To transmit the single tone signal, press the ASQ button on the microphone while transmitting (pressing the PTT button).

tb Menu – Talk Back Volume Setting



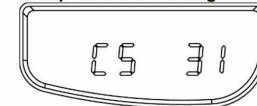
tb Menu – Default Setting is 31. Talk Back (TB) allows for monitoring of the operator's transmitted audio. The volume level is adjustable from off to 63 (100%). This setting is also available from the TB front panel control.

CS Menu – CW Side Tone Volume Setting



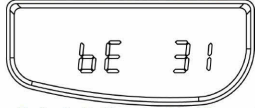
CS Menu – Default Setting is 31. The volume, or level, of the radio's CW side tone is adjustable from off to 63 (100%).

iC Menu – Microphone Gain Setting



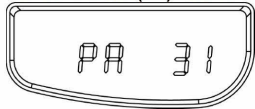
iC Menu – Default Setting is 31. The gain of the radio's microphone is adjustable from off to 63 (100%). This setting is also available from the MIC front panel button. See 18. in Front Panel Control section.

bE Menu – Beep Tone Volume Setting



bE Menu – Default Setting is 31. The volume of the radio's beep tone is adjustable from off to 63 (100%). See R.B. / BP in Front Panel Control section for more detail.

PA Menu – Public Address (PA) Volume Setting



PA Menu – Default Setting is 31. The volume of the radio's public address transmission is adjustable from off to 63 (100%). See Operating Mode in Front Panel Control section for more detail.

REAR PANEL

1. External Speaker / PA Jack

A combination external speaker and public address (PA) jack is located on the rear panel of the transceiver.

The MAGNUM 1 is designed to accept any standard 8 ohm external speaker for use with two-way transceivers. When an external speaker is connected to this jack the radio's internal speaker is disconnected.

To use the radio's PA feature (see 9. Operating Mode in Front Panel Controls section) a public address horn (speaker) should be connected to this jack.

2. CW Key Jack

To operate CW (morse code) connect a CW key, or paddle, to the CW Key jack on the back of the radio.

3. DC Power Input

The radio uses a standard 3-pin DC power cord with 10 amp inline fuse. Important: Note polarity when connecting power cord to power input jack.

4. ANT (Antenna)

The radio uses a standard UHF (SO-239) style antenna jack. Use only 50-ohm coaxial cable with PL-259 style connect.

OTHER FEATURES

1. FACTORY RESET

To reset the radio back to factory (out of the box) programming:

- (1) Turn radio off.
- (2) Press both FUNC button and SCAN button simultaneously.
- (3) Turn radio on.
- (4) Release FUNC and SCAN buttons.
- (5) LCD will read rES ?
- (6) To start reset press the FUNC button.
- (7) LCD will count down and radio will reset back to factory programming.

GENERAL SPECIFICATIONS

Frequency Coverage	: Transmit and Receive	24.890~24.990 & 28.000~29.699 MHz
Antenna Impedance	: 50 ohm, unbalanced	
Frequency Control	: Digital Phase-Lock Loop (PLL) Synthesizer	
Frequency Tolerance	: 0.005%	
Frequency Stability	: 0.001%	
Temperature Range	: -30 to +50 degree C	
Power Requirement	: 12 - 13.8 V DC, negative ground	
Current Consumption	: 9 amps maximum	
Dimensions	: 7.75 x 2.25 x 10.75 in (W x H x D)	
Weight	: 4.4 lbs	

TRANSMITTER SPECIFICATIONS

Power Output	: SSB	50 Watts
	: FM / CW	20 Watts
	: AM	1-10 Watts Average / 50 Watts PEP
Tuning Steps	: 5 Hz / 10 Hz / 100 Hz / 1 kHz / 10 kHz / 100 kHz / 1 MHz	
Final Transistor	: ERF2030 (x2)	
Spurious Emissions	: More than 50 dB below peak output power	
Carrier Suppression	: More than 55 dB below peak output power	
Unwanted Sideband	: More than 50 dB below peak output (1 kHz tone)	
FM Deviation	: +/- 2 kHz maximum	
Audio Response	: More than 30dB below peak output	
Frequency Response	: 300 to 3000 Hz	
Microphone Impedance	: ECM, 2.2K ohms	

RECEIVER SPECIFICATIONS

Circuit Type	: Dual-Conversion Superheterodyne	
Intermediate Frequencies	: 1st IF / SSB IF	10.695 MHz
	: 2nd IF	455 kHz
Sensitivity	: SSB	0.25 μ V at 10 dB S + N/N
	: AM	1.0 μ V at 10 dB S + N/N
	: FM	0.3 μ V at 12 dB SINAD
Selectivity	: SSB	6.0 kHz (-6 dB) / 3.3 kHz (-60 dB)
	: AM / FM	6.0 kHz (-6 dB) / 9 kHz (-60 dB)
Clarifier Range	: Continuous (Digital VFO)	
Adjacent Channel Rejection	: Better than 70 dB	
IF Rejection	: Better than 80 dB for all frequencies	
Frequency Response	: 250 to 3000 Hz	
Audio Output Power	: 3 watts minimum at 10% THD with an 8 ohm load	
Audio Output Impedance	: 8 ohms	