

## Magnum DeltaForce Updates and Modifications



### GENERAL SPECIFICATIONS

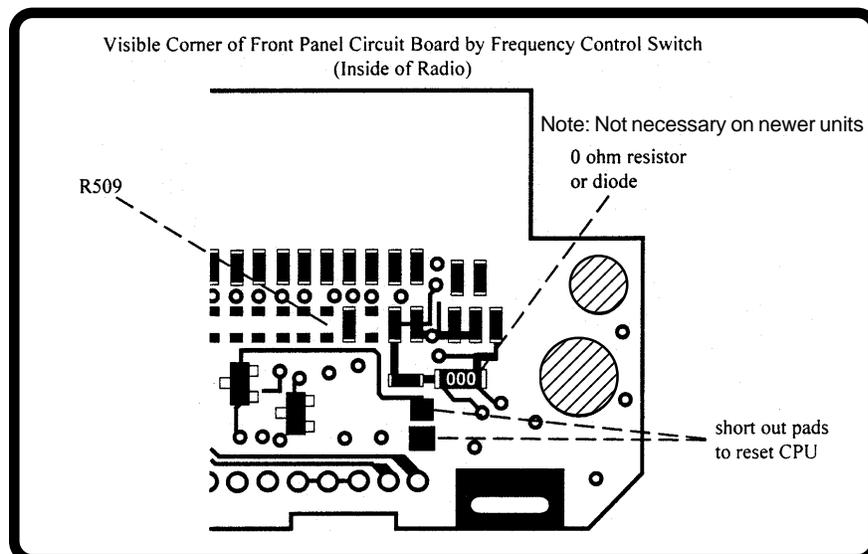
Frequency Coverage.....	28.000 - 29.699 MHz
RF Power Output.....	30 Watts PEP
Modes.....	AM, FM, USB, LSB, CW
Tuning Steps.....	1 kHz, 10 kHz or 100 kHz
Memory Channels.....	5 Channels
Antenna Impedance.....	50 ohms, unbalanced
Power Requirement.....	12 - 16 Volt DC
Dimensions.....	2.4(H) x 7.9(W) x 9.3(D) in
Weight (approx.).....	4 lbs.

### FEATURES

Microprocessor Controlled	Last Channel Recall
Variable RF Output Power	Automatic Call Frequency Control (FM 29.600 MHz)
5 Digit LCD Frequency Display	Receive Audio Tone Control
S/Rf and SWR Meter	Scanning Microphone
LCD Peak Reading RF Meter	Offset (Split) Frequencies
Noise Blanker	Night Illuminated Display with Dimmer Control
Automatic Noise Limiter	1 Year Warranty
Frequency Scan	MARS and CAP Capable (permits required)
	Extended Service Contracts Available

### Export Frequency Modification Instructions: (25.165 - 29.000 Mhz)

1. Power up the radio for a minimum of 10 seconds.
2. Turn off and remove power and antenna.
3. Remove covers.
4. Add a 47K resistor to R509 pads. (NOTE: Not necessary on newer units)
5. Remove frequency control knob on the front panel.
6. Remove diode D555 located directly above frequency control switch.
7. Reset the CPU by shorting the two pads as shown.
8. Assemble the radio.
9. Use the (CALL) button to select bands.  
To switch between channel and frequency display, press (FUNC) and press (CALL).



## Magnum DeltaForce Updates and Modifications

### VARIABLE RESISTOR INFORMATION

<u>Variable Resistor</u>	<u>Adjustment</u>
RV-101	AM "S" Meter
RV-102	SSB "S" Meter
RV-103	SSB Squelch
RV-104	AM Squelch
RV-106	FM Deviation
RV-107	SSB Carrier Balance
RV-108	Transmit Frequency Adjustment
RV-109	FM Repeater Tone
RV-111	RF Meter
RV-112	Q169 Final Bias Control
RV-113	Q168 Final Bias Control
RV-114	Driver Bias Control
RV-116	SSB ALC
RV-117	AM Carrier Low Power Adjustment
RV-118	AM Carrier High Power Adjustment
RV-119	AM AMC
RV-120	CW Side Tone

### AM CARRIER POWER OUTPUT ADJUSTMENTS

Follow the steps below to reset or adjust the DeltaForce AM carrier power output levels.

1. Remove the bottom, or speaker, cabinet.
2. Connect the radio to a reliable and calibrated watt meter.
3. Rotate the front panel power control full clockwise (maximum power output setting).
4. To set maximum AM carrier level, adjust RV-118 to desired level. DO NOT ADJUST CARRIER LEVEL OVER 10 WATTS.
5. Rotate the front panel power control full counter-clockwise (minimum power output setting).
6. To set minimum AM carrier level, adjust RV-117 to desired level.

### LOWERING AM CARRIER POWER LEVEL

The stock DeltaForce has the AM carrier power level set at 4 watts minimum and 10 watts maximum. Follow the steps below to set the AM carrier power level to 1 watt minimum and 10 watts maximum.

1. Turn off the radio and disconnect from power source.
2. Remove the bottom, or speaker, cabinet.
3. Locate 470 ohm resistor on the power/calibrate front panel control potentiometer.
4. Add a 220 ohm resistor across the 470 ohm resistor (solder the legs of the 220 ohm resistor to the legs of the 470 ohm resistor).
5. Reset AM carrier power output for 10 watts maximum. See AM CARRIER POWER OUTPUT ADJUSTMENTS instruction.

### DISABLING THE ALC FOR INCREASED MODULATION

Many radio operators prefer to remove the modulation limiting transistor from their radio to increase the modulation. Follow the steps below to do this modification. NOTE: As with any radio, removing the modulation limiting transistor in the DeltaForce will increase distortion and is not recommended by the manufacturer.

1. Turn off the radio and disconnect from power source.
2. Remove the cabinets.
3. Locate and remove the Q 142 transistor. This is the modulation limiting transistor.

## Magnum DeltaForce Updates and Modifications

### UNLOCKING THE CLARIFIER

Out of the box the DeltaForce clarifier control tracks only receive. Follow the steps Below to have the clarifier track on both receive and transmit.

1. Turn off radio and disconnect from power source.
2. Remove both top and bottom cabinets.
3. Locate and unsolder the diode at D 176.
4. Locate and unsolder the resistor at 8244. Save this resistor for a later step.
5. Locate and unsolder the resistor at 8306. Replace 8306 with a jumper wire.
6. Locate the variable resistor at RV 108. Find the leg of RV 108 that is closest to the 8244 resistor location and cut it from the circuit board.
7. Position the radio with the face towards you and the solder side of the main circuit board up.
8. Locate the 8244 circuit board pad that is closest to the front of the radio. Follow this trace to the pin on the white edge connector. Take the removed resistor from 8244 (step 3) and solder one leg of the resistor to this pin. Count over 2 pins to the right (this pin should be +8 volts DC) and solder the other leg of the resistor to this +8 volt pin.
9. Turn the radio over and locate the gray wire on the clarifier front panel control potentiometer. Follow the gray wire to the 12 pin connector and cut the gray wire by this connector.
10. Solder the gray wire to the junction of RV 108 and D 176. Use the hole at the junction where D 176 was removed. 11. Put the front panel clarifier control in the 12 o'clock (center) position and adjust RV 108 for center frequency.

### IMPROVED AGC AND SELECTIVITY MODIFICATION

These modifications for the DeltaForce address the following issues:

Receiver overloading by strong signals

Fluttering or sputtering during reception of multiple AM signals just above "S-9" signal strength

Increases SSB IF AGC action to keep SSB "S" meter readings in calibration with AM "S" meter readings at 30dB

Smooths out the SSB AGC

Corrects channel bleed-over problems

Follow the steps below to correct the above issues:

1. Turn off the radio and disconnect from power source.
2. Remove the cabinets.
3. Locate and remove the 2.2K ohm resistor at 8188. Install (replace with) a 510 ohm resistor.
4. Locate and remove the 10gF electrolytic capacitor at C 161. Install (replace with) a 33 RF electrolytic capacitor.
5. On the solder side of the circuit board, locate the junction of LI07 and Q124, and solder the band side of a 1N4148 diode to this junction. Locate the junction of L107 and 8196, and solder the other side of the 1N4148 diode to this junction.
6. Locate and remove the 2.2K ohm resistor at 8218. Install (replace with) a 1.2K ohm resistor.
7. Locate and remove the 100K ohm resistor at 8147. Install (replace with) a 47K ohm resistor.
8. On the solder side of the circuit board, locate the junction of 8161, 8159, DI 11 and C139, and solder the band side of a 1N4148 diode to this junction. Locate the junction of 8162 and C 138, and solder the other side of the 1N4148 diode to this junction.

NOTE: If the DeltaForce radio is going to be used exclusively on AM and FM modes and not SSB, only steps 3, 4 and 5 are necessary. Steps 6, 7 and 8 enhance the receive on SSB.

### MICROPHONE AUDIO LEVEL ADJUSTMENTS

DeltaForce radios with the single echo/talk back board also feature an electret microphone. The electret microphone features an audio level adjustment control. To adjust the microphone's audio level follow the steps below:

1. Disassemble the microphone by removing the 2 screws on the back of the microphone.
2. Located on the circuit board inside the microphone is a control potentiometer. This is the electret microphone's audio level control.
3. Using a small jeweler's screwdriver, carefully rotate the potentiometer to the desired audio level.

## Magnum DeltaForce Updates and Modifications

### ECHO AUDIO DISTORTION

Distorted echo audio may be experienced with a small number of the early DeltaForce radios. Only the radios that have the separate echo and talk back boards connected by a solder strap have the potential for this problem. If you have a DeltaForce radio with a single, integrated echo and talk back board, then this potential problem has been taken care of and this instruction can be disregarded.

If this echo audio distortion problem is experienced follow the steps below to correct it.

1. Turn off radio and disconnect from power.
2. Remove bottom, or speaker, cabinet.
3. Locate the echo board mounted to the chassis of the radio.
4. On the solder side of the echo board, locate the J1 connector. The J1 connector has the audio line coming from the talk back board.
5. Locate the gray coax line going to J1. If the shield from this gray coax line is connected to J1 then cut it at the board and insulate it to protect against possible shorts.
6. Removing of this shield and insulating it should correct any echo audio distortion.

### ECHO BOARD ADJUSTMENTS

Located on the echo board in the DeltaForce radios are some additional controls. Early DeltaForce models featured a separate echo and talk back board connected together by a solder strap. All other DeltaForce radios feature a single, integrated echo and talk back board. Determine which type of DeltaForce you have and follow the steps below to make adjustments.

#### Early DeltaForce Models - Separate Echo and Talk Back Board

##### **Fine-Tuning for Desired Echo Sound**

A secondary echo volume control potentiometer is located on echo board. This control can be considered a “coarse” echo volume adjustment. Follow the steps below to achieve the desired echo sound.

1. Remove the bottom, or speaker, cabinet.
2. Locate the SVR2 potentiometer on the solder side of the echo board. Adjust this SVR2 to obtain the desired echo range.
3. To set for maximum echo effect do the following:
  - a) Turn the front panel echo volume control full clockwise and the front panel echo delay control full counter-clockwise.
  - b) Locate the microphone input jack on the side of the radio. Temporarily jumper pin 3 to pin 5 on the microphone jack.
  - c) Connect the radio to power and a dummy load or antenna, and turn on the radio.
  - d) Adjust SVR2, until a slight feedback sound is achieved. The echo board will now be set a maximum effect
  - e) Turn off the radio and remove the jumper from the microphone jack.
  - f) Turn on the radio and rotate the front panel echo delay control full clockwise and test for desired echo.

##### **Audio Output Level Adjustments**

An audio output level potentiometer is located on the echo board. If a low output microphone, such as an RK-56 or an Astatic 636L, is used with the DeltaForce it may be necessary to adjust the audio output level potentiometer. Follow the steps below to adjust the audio output level potentiometer.

1. Remove the bottom, or speaker, cabinet.
2. Remove the 2 screws holding the echo board to the chassis. NOTE: The 2 screws are different, the sheet metal screw is used in the hole closest to the front of the radio and the machine screw is used in the hole closest to the rear of the radio.
3. Carefully turn the echo board over and locate the SVR1 potentiometer. This is the audio output level control.
4. Adjust SVR1 to the desired output level for the microphone used.

#### Current DeltaForce Models - Single Echo and Talk Back Board

## Magnum DeltaForce Updates and Modifications

### Fine-Tuning for Desired Echo Sound

A secondary echo volume control potentiometer is located on echo board. This control can be considered a “coarse” echo volume adjustment. Follow the steps below to achieve the desired echo sound.

1. Remove the bottom, or speaker, cabinet.
2. Position the radio with the front panel facing towards you and the component side of the circuit board up.
3. Located in the left hand corner (closest to the front face of the radio) of the echo/talk back board is an access hole for the SVR1 potentiometer. Using a small jeweler’s screwdriver, adjust SVR1 for the desired echo sound,
4. To set for maximum echo effect do the following:
  - g) Turn the front panel echo volume control full clockwise and the front panel echo delay control full counter-clockwise.
  - h) Locate the microphone input jack on the side of the radio. Temporarily jumper pin 3 to pin 5 on the microphone jack.
  - i) Connect the radio to power and a dummy load or antenna, and turn on the radio.
  - j) Adjust SVR1, until a slight feedback sound is achieved. The echo board will now be set a maximum effect
  - k) Turn off the radio and remove the jumper from the microphone jack.
- 1) Turn on the radio and rotate the front panel echo delay control full clockwise and test for desired echo.

### Audio Output Level Adjustments

An audio output level potentiometer is located on the echo board. If a low output microphone, such as an RK-56 or an Astatic 636L, is used with the DeltaForce it may be necessary to adjust the audio output level potentiometer. Follow the steps below to adjust the audio output level potentiometer.

1. Remove the bottom or speaker, cabinet.
2. Position the radio with the front panel facing towards you and the component side of the circuit board up.
3. On the echo/talk back board, located between the 2 mounting screws is an access hole for the SVR2 audio output level potentiometer.
4. Using a small jeweler’s screwdriver, adjust SVR2 to the desired output level for the microphone used.