

APPENDIX 5
USERS MANUAL

USER INSTRUCTIONS FOLLOW THIS SHEET

USERS MANUAL
FCC ID: MMA75505

APPENDIX 5

MIDLAND



MODEL 75-505

**NEW FRS "FAMILY RADIO SERVICE"
MICRO-SIZE WITH MAXIMUM POWER
1 CHANNEL, PROGRAMMABLE TO
14 AVAILABLE CHANNELS
POWER SAVE CIRCUIT**

TIPS FOR GETTING THE MOST FROM YOUR 75-505

Due to the band of operation (462/467 Mhz) the 75-505 provides communications that are virtually free of atmospheric interference (skip) that is common on lower frequency bands. Along with this and an antenna system that is very efficient as compared to other unlicensed radio bands, communications range is surprisingly good. Many times the limit to maximum possible range are environmental factors such as blockage caused by trees, buildings, hills, or other obstructions. If you find communication is not possible, many times this can be overcome by moving only a few feet to a new location. Range may be reduced while operating in a vehicle or from inside to outside a metal building. Battery condition also affects range. The 75-505 operates on alkaline batteries. While this unit has been designed with gaskets for water resistance and ruggedness it is a precision piece of electronic equipment that should not be exposed to water or handled carelessly. Normal care should result in years of trouble free operation. Do not leave batteries installed over a long period of time as leakage may occur, that can destroy the radio. Always save your receipt, as it is required for warranty consideration.

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OPTIONAL ACCESSORIES FOR YOUR RADIO

Accessory Name	Model Number
Standard Ni-Cad Charger	18-395
Lapel Microphone with Earbud Speaker.....	22-
Speaker/Microphone.....	22-
Stealth Type Noise Canceling Throat Mic with Earbud.....	22-
Boom Microphone Headset	22-

Call 1 816 241 8500 ext. 200 to order accessories

THIS RADIO COMPLIES WITH PART 15 OF THE FCC RULES. OPERATION IS SUBJECT TO THE CONDITION THAT THIS DEVICE DOES NOT CAUSE HARMFUL INTERFERENCE.

Your Midland model 75-505 brings the new FRS (Family Radio Service) to your fingertips. The Family Radio Service is provided for by the FCC and is totally license free. For the first time business and the general public can use the quiet UHF FM band for personal communications at no charge. The 75-505 uses maximum allowable power for range up to 2 miles. Use for fishing, hunting, picnics, biking, business, or any other activity where communications are needed for convenience or safety. The model 75-505 operates as a single channel radio with the ability to be programmed for any one of 14 channels to provide the best in quiet and private communication. Also this radio offers power save, time out timer and squelch.

PREPARATION

BATTERIES

75-505 radios operate with 3AAA alkaline batteries or optional Ni-cad batteries. Alkaline batteries will provide about 45 hours of use. Ni-cad batteries provide about 15 hours of use. The 75-505 is not supplied with Ni-cad batteries and a wall charger or alkaline batteries. Ni-Cad batteries must be charged prior to use. Charge time is 10 hours with the wall charger.

To Install Batteries:

1. Hold the radio face down. Press the battery cover firmly at the ridges.
2. Slide the battery cover off the unit.
3. Insert 3 AAA batteries observing the proper polarity.
4. Replace the battery cover by sliding it up until secure.

Low Battery/Transmit Indicator:

The "TX/BATT" LED on the front of the radio will light when the unit is transmitting and when the batteries are low.

BELT CLIP

The 75-505 comes standard with a belt clip. Attach it to the radio back by sliding the top of the clip over the two rectangular bosses on the back of the radio until it snaps into place. To detach the belt clip, press the lever inside the top of the clip away from the radio body and slide the clip toward the bottom of the radio.

QUICK USE INSTRUCTIONS:

1. Install fresh or fully charged batteries.
2. Attach the antenna.
3. Turn the unit on by turning the volume control clockwise.
4. To talk press the PTT button on the side of the radio and talk into the front of the radio. When the PTT button is pressed continuously for 2 ½ minutes, the transmitter is turned off by the time out timer.
5. To listen release the PTT button.
6. Volume and other functions may be adjusted as described later.

POWER SAVE CIRCUIT

This part of the operation of the radio is completely automatic and not adjustable. When the radio has not transmitted or received a signal for several seconds it will begin to cycle from a sleep mode to fully on. This occurs several times a second. If a signal is received or you cause the unit to transmit the radio will become fully awake. This cycling from sleep to fully on increases the standby battery life more than 50%.

FEATURES AND LOCATION OF CONTROLS

The antenna must be screwed into the connector on top of the radio before using. Do not over-tighten.

TO TURN THE RADIO ON OR OFF

The ON/OFF/VOLUME control at the top of the radio controls power and volume. A series of tones will be heard confirming that radio is working.

TO CHANGE THE CHANNEL IN USE

The channel programming switches are reached through the battery compartment. To select a channel, consult the table of switch settings in Table 1 below. This data is also found on a label inside the battery cover. Remove the batteries and use a pen or pencil point to move the switch levers to the positions indicated for the channel selected. Reinstall the batteries.

Dip SW Channel	Frequency	1	2	3	4
1	462.5625MHz	ON	ON	ON	OFF
1	462.5625MHz	OFF	OFF	ON	OFF
1	462.5625MHz	OFF	ON	ON	ON
2	462.5875MHz	ON	OFF	OFF	OFF
3	462.6125MHz	OFF	ON	OFF	OFF
4	462.6375MHz	ON	ON	OFF	OFF
5	462.6625MHz	OFF	OFF	ON	OFF
6	462.6875MHz	ON	OFF	OFF	OFF
7	462.7125MHz	OFF	ON	ON	OFF
8	467.5625MHz	ON	ON	ON	OFF
9	467.5875MHz	OFF	OFF	OFF	ON
10	467.6125MHz	ON	OFF	OFF	ON
11	467.6375MHz	OFF	ON	OFF	ON
12	467.6625MHz	ON	ON	OFF	ON
13	467.6875MHz	OFF	OFF	ON	ON
14	467.7125MHz	ON	OFF	ON	ON

TABLE 1. Channel Selection

TO ADJUST THE VOLUME

Use the ON/OFF/VOLUME control to adjust the volume. To test the volume setting, press the "MON" button so static noise can be heard. The noise can be used as a reference level for volume setting.

TROUBLESHOOTING

PROBLEM

SOLUTION

No Power	1. Check battery installation and/or replace batteries
Cannot Receive Messages	1. Make sure the volume is set high enough. 3. Change your location, you may be out of range. 4. Install batteries properly or replace.
Range is Short	1. Operating the radio in a vehicle or metal building will decrease the range. If possible operate outside of vehicles or buildings. 2. Carrying the radio so that the antenna is very near the body will decrease the range. Hold the radio in the open for the best range.
Interference/Static	1.

CARE OF RECHARGEABLE NI-CAD BATTERIES

ALWAYS DISPOSE OF BATTERIES PROPERLY

Always follow the battery manufactures recommendations for charging and disposing of ni-cad batteries.

The following is meant as general information regarding ni-cad batteries.

3. The above will prevent the batteries from developing "memory" which effectively reduces their capacity.
4. It is better to store ni-cad batteries that are discharged rather than charged.

SERVICE:

If it ever becomes necessary to return your unit for service:

Pack the unit in its original box and packing. Improper packing may result in damage during shipment.

Include a full description of any problems. Include your telephone number.

Include a money order for \$7.50 to cover shipping and handling (this may not be required in some states).

You do not need to return accessory items (brackets, screws, power cord, antenna, etc.) unless they maybe directly related to the problem.

Include a photocopy of the bill of sale or other proof of purchase showing the date of sale. This information must be included before warranty service can be considered.

TECHNICAL SPECIFICATIONS*

GENERAL

- Frequency range.....462/467 Mhz
 - Channels.....14
 - Modulation type..... FM
 - Antenna impedance.....50 Ohm
 - Loudspeaker.....8 Ohm 0.5W
 - Microphone.....electronic type
 - Power supply.....4 AAA Ni-cads or Alkaline(4.8/6.0VDC)
- RECEIVER**
- Sensitivity at 12dB Sinad.....0.25µV
 - Selectivity.....Adjustable
 - Squelch range.....0.25W @ 8 Ohm (10% distortion)
 - Audio output power.....7%
 - Distortion at 1000 mV.....400-2400 Hz
 - Audio frequency response.....

TRANSMITTER

- RF Output Power..... nominal 500 mW @ 6.0VDC
- Frequency Tolerance.....0.00025%
- Harmonic Suppression.....more than 50 dB
- Modulation.....FM +/- 2.5 KHz

*Specifications are nominal and subject to change
CHANNEL FREQUENCIES

01=462.5625	05=462.6625	09=467.5875	13=467.6875
02=462.5875	06=462.6875	10=467.6125	14=467.7125
03=462.6125	07=462.7125	11=467.6375	
04=462.6375	08=467.5625	12=467.6625	

LIMITED WARRANTY

Midland Consumer Radio Inc. will repair or replace, at its option without charge, any Midland Mobile, 4 watt portable, FRS, or Base Station Citizens Band transceiver which fails due to a defect in material or workmanship within one year following the initial consumer purchase.

This warranty does not include any carrying cases, earphones, or telescoping antennas which may be a part of or included with the warranted product, or the cost of labor for removal or re-installation of the product in a vehicle or other mounting.

Performance of any obligation under this warranty may be obtained by returning the warranted product, freight prepaid, along with proof of purchase date, to Midland Consumer Radio Inc., Warranty Service Department, 1670 North Topping Avenue, Kansas City, Missouri 64120, or to any "Midland Authorized Warranty Service Station," or to the place of purchase (if a participating dealer).

Warranty information and the location of the nearest "Midland Authorized Warranty Service Station," may be obtained by writing Midland Consumer Radio, Warranty Service Department.

This warranty gives you specific legal rights, and you may also have other rights which vary from state to state.

Note: The above warranty applies only to merchandise purchased in the United States of America or any of the territories or possessions thereof, or from a U.S. Military exchange. For warranty coverage on merchandise purchased elsewhere, consult the supplemental warranty information included with this product or ask your dealer.

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Printed in China

APPENDIX 6
TRANSMITTER ALIGNMENT

ONE (1) PAGE ALIGNMENT PROCEDURE FOLLOWS THIS SHEET

TRANSMITTER TUNE-UP PROCEDURE
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7. Alignment instructions

WARNING

Any repairs or adjustments should be made under the supervision of a qualified radio-telephone technician.

TRANSMITTER

1. Power Supply Voltage

The Power supply voltage should be set for 6.0 VDC measured at the radio during transmit. Periodically check the power supply voltage during the alignment procedure.

2. Frequency Setting

- A. Connect a frequency counter or Communications Service Monitor to the antenna connector through an RF power attenuator (5 watt minimum rating, 20 dB minimum attenuation).
- B. Depress the PTT switch.
- C. Adjust the TCXO-1 trimmer capacitor such that the output frequency is equal to the channel frequency with a maximum error of +/- 200 Hz.
- D. Release the PTT switch.

3. Output Power Alignment.

- A. Set the power supply voltage for 6.0 VDC.
- B. Connect a Communications Service Monitor or a watt meter and dummy load to the antenna connector.
- C. Depress the PTT switch.
- D. To be convinced for 0.5 Watt(50 ohm load) output power with a maximum error of - 0.15 Watts.
- E. Release the PTT switch.

4. Deviation Adjustment.

- A. Connect an audio generator .
The audio frequency should be set at 1 KHz.
- B. Connect an FM deviation meter or Communications Service Monitor to the antenna connector through an RF power attenuator (5 watt minimum rating, 20 dB minimum attenuation). Set the monitor to read peak deviation.
- C. Depress the PTT switch.
- D. Adjust RV3 for +/- 2.5KHz maximum deviation.
- E. Release the PTT switch.

APPENDIX 7

CIRCUITS AND DEVICES TO STABILIZE FREQUENCY

SYNTHESIZER

A phase locked loop (PLL) circuit establishes and stabilizes operating frequency.

The data for producing necessary frequencies is established by the CPU on the digital board.

The frequency stability of the Tx/Rx is maintained by the TCXO, which generates a stable frequency of 12.8 MHz.

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APPENDIX 8

CIRCUITS TO SUPPRESS SPURIOUS RADIATION
AND LIMIT MODULATIONCircuitry to Suppress Spurious Emissions

Output from the final RF power amplifier, Q21, and presented to a low-pass filter configured in a "pi" network consisting of L23, C310, C306, L25, C311, L26, C312, C313, L27, C315, C316, and L306.

Circuitry to Limit Modulation and Audio Low Pass Filter

Microphone signal is amplified by IC6A, limited in IC6B to prevent deviation over 2.5 kHz, and applied to a 3 kHz low-pass filter configured around IC6.

CIRCUITS TO SUPPRESS SPURIOUS
RADIATION AND LIMIT MODULATIONFCC ID: MMA75505
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