FMA LIMITED WARRANTY ON RADIO RECEIVER PRODUCTS

FMA, Inc. warrants this receiver to be free of manufacturing defects for the term of one year from the date of purchase. Should any defects covered by this warranty occur, the receiver shall be repaired or replaced with a unit of equal performance by FMA, Inc., or an authorized FMA service station.

LIMITS AND EXCLUSIONS

This warranty may be enforced only by the original purchaser, who uses this receiver in its original condition as purchased, in strict accordance with the Magnum 8 owner's manual. Receivers returned for warranty service to an FMA service center will be accepted for service when shipped post-paid, with a copy of the original sales slip or warranty registration form, to the service station advised by FMA, Inc.

THIS WARRANTY DOES NOT APPLY TO

1. Consequential or incidental losses resulting from the use of this receiver.
2. Damage resulting from accident, crashes, misuse, abuse, neglect, electrical surges, reversed polarity on connectors, lightning or other acts of God.
3. Damage from failure to follow instructions supplied with the product.
4. Damage occurring during shipment of the product either to the customer or from the customer for service (claims must be presented to the carrier).
5. Damage resulting from repair, adjustment, or any alteration to product by any one other than an authorized FMA technician.
6. Installation or removal charges, or damage caused by improper installation or removal.

CALL (301) 668-7614 FOR INFORMATION ABOUT SERVICE AND WARRANTY REPAIRS.

MAGNUM 8

8 CHANNEL FM DUAL CONVERSION AUTOMATIC UNIVERSAL RECEIVER

OWNER'S MANUAL

NOTE: PLEASE READ MANUAL COMPLETELY BEFORE OPERATION

INTRODUCTION:

Thank you for purchasing the FMA Direct Magnum 8 FM receiver. The new Magnum series represents the fifth generation in a history of high quality radio control receivers designed by FMA, Inc. The latest trend in the industry has been the move to smaller and smaller airborne equipment. FMA pioneered these efforts with the micro 2000, Fotress micro and Tetra. By incorporating the highest level of technology available to the R/C industry, FMA engineers are committed to providing consumers with substantial size and weight reduction while at the same time improving performance over previous designs. This philosophy is vastly different from other manufacturers who rush to market smaller products that are not even 1991 compliant, have limited range and performance, and hence experience serious problems when used at typical R/C fields. Magnum series receivers are designed with extremely narrow bandpass and full-range capabilities. Furthermore, because they are dual conversion, interference rejection on all fronts is unsurpassed. You may fly your Magnum 8 in anything from park or indoor models to sport models or helicopters to IMAA legal quarter scale aircraft with complete confidence regardless of how many pilots are in the air simultaneously. Designed to operate as a universal, automatic shift sensing receiver, the Magnum 8 supports either positive or negative FM modulation without the use of dip switches or jumpers. As usual, superior RF mixer technology and advanced circuitry for detecting and amplifying PPM information enable the Magnum 8 to out-perform other single and dual conversion designs presently offered. Heavy-duty, SMT construction on a single, glass-epoxy P.C. board along with various other circuit improvements make our latest designs the most reliable we have ever produced.

SPECIFICATIONS:

SIZE:	**2.16"L X 1.00"W X 0.58"H (IN HEAT SHRINK CASE)**
WEIGHT:	**15 gm / 0.50 OZ.**
DESIGN:	**DUAL CONVERSION, SUPER HETERODYNE**
CHANNELS:	**1-8**
MODULATION:	**FM / PPM (PULSE POSITION MODULATION)**
FREQUENCY:	**R/C CH 00 - 90 - U.S. LEGAL 50, 53, 72, 75 MHz**
ULTIMATE BANDPASS:	**± 8.5 KHz @ >55 dB DOWN**
USABLE SENSITIVITY:	**> -95 dBm**
3OIP:	**+12 dBm**
OPERATING VOLTAGE:	**+3.5V TO +26V DC LIMITED ONLY BY SERVO REQUIREMENTS**
LEGAL USE:	**MEETS AMA GUIDELINES/FCC 1999 RADIATION REQUIREMENTS**

FMA, Inc.
5716A Industry Lane
Frederick, MD 21704
Sales: (800) 343-2934 -Technical: (301) 668-7614

FMA Direct

* FCC Information: FCC ID: KH8-T2000 - This device complies with Part 15 of the Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept interference received, including interference that may cause undesired operation.

PACKAGE CONTENTS:

1. FMA Direct Magnum 8 FM, 8 channel automatic universal receiver
2. Dealer or factory-installed channel crystal (if purchased with unit)
3. Owner's Manual

PREPARATION:

- **TRANSMITTER COMPATIBILITY, POWER AND SERVO CONNECTION**

Magnum 6 receivers are universal and automatic in operation. This means that the same receiver now supports both negative (Futaba/Hitec style) and positive (JR/Airtronics) FM transmitter modulation. There are no dip switches or jumpers to set for this feature. Simply connect the Magnum to power, hook up your servos as per the following instructions and power up the transmitter first then the receiver. The Magnum will automatically detect which type of shift is coming from your transmitter and adjust its internal circuitry to match. Magnum series are designed for use with all standard servo connectors and support Futaba, JR, Hitec servos, and Airtronics servos equipped with the new "Z TYPE" connectors, as well as other brands that use standard polarity (GROUND, PLUS, SIGNAL). When connecting power and servos to your Magnum, please refer to TABLE 1 and Figure 1 for proper hookup of your servos. Note: with the receiver sitting label side up, the signal lead (marked #3 in Figure 1 and color coded as in TABLE 1) must match up to the pin closest to the label side of the receiver. No damage will occur by plugging a servo in backwards, but the servo will not operate. You may mix and match any standard type servos, but neither may be used in combination with "Old Style" Airtronics servos – see warning below. When hooking up power to your receiver, you may either connect a NiCd battery pack to any unused channel input or use a "Y" harness to connect the battery and a servo simultaneously to any receiver channel.

TABLE 1 SERVO PLUG ORIENTATION

SERVO BRAND	1	2	3
FUTABA	BLK	RED	WHT
JR	BRN	RED	ORG
HITEC	BLK	RED	YLW

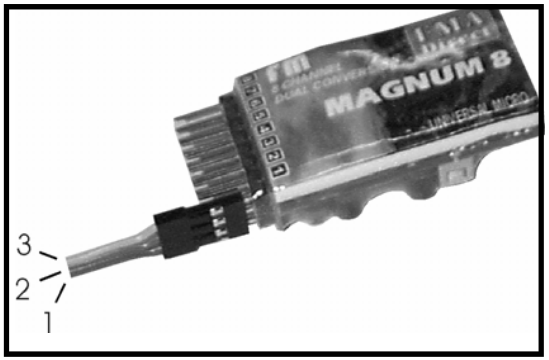

Figure 1 - Model 608FM72 Shown

WARNING: IF YOU INTEND TO INTERFACE AIRTRONICS SERVOS THAT USE "OLD STYLE" (PRE-"Z TYPE") AIRTRONICS CONNECTORS TO THE MAGNUM 8, YOU MUST UPDATE THE CONNECTOR TO THE CURRENT INDUSTRY STANDARD POLARITY (SEE FIGURE 1) AND PROPER INDUSTRY STANDARD SHELL THICKNESS. YOU MAY READILY CONVERT YOUR EXISTING "OLD STYLE" AIRTRONICS CONNECTORS TO CURRENT STANDARDS 1) BY INSTALLING APPROPRIATE ADAPTERS (FMA PN 217AJ) OR 2) BY REMOVING THE OLD CONNECTORS AND PINS AND REPLACING THEM WITH FMA PART NUMBER SEASSYJ. EACH SEASSYJ CONTAINS ONE JR COMPATIBLE MALE SHELL AND 3 FEMALE PINS. YOU WILL NEED TO CRIMP THE PINS AND SOLDER THEM TO THE WIRES OF YOUR EXISTING SERVO AND PLUG THEM INTO THE SHELL PROVIDED. MAKE CERTAIN THAT THE RED WIRE (+V) GOES TO THE CENTER PIN AS ILLUSTRATED IN FIGURE 1. FMA WILL NOT ACCEPT RESPONSIBILITY FOR ANY ATTEMPT TO USE "OLD STYLE" AIRTRONICS CONNECTORS WITH MAGNUM SERIES RECEIVERS THAT DO NOT HAVE THE POLARITY CHANGED TO INDUSTRY STANDARDS.

- **CRYSTALS**

All Magnum 8 receivers support full crystal interchangability using FMA Direct Quantum or Fortress series dual conversion crystals. The only difference between these crystals is the size. The new Quantum series crystals are low-profile and will not stick up as high in the receiver. Contact your local FMA Direct dealer or call FMA Direct to obtain the correct crystal for operation with your transmitter frequency. Plug the crystal into the gold-plated crystal sockets and secure with a piece of tape or the channel sticker provided.

INSTALLATION

Care must be taken when installing your receiver to isolate the electronics from vibration. Do this by wrapping the receiver in 3/8" thick foam rubber. Restrain the foam-packed receiver using Velcro or a rubber band if necessary. **NOTE: FAILURE TO USE FOAM RUBBER AS DESCRIBED ABOVE DURING INSTALLATION VOIDS PRODUCT WARRANTY.** Extend the antenna to its full length. Do not coil the antenna up or range will be shortened. If you are installing the Magnum 8 in a small aircraft and you require a shorter antenna, you may cut off a portion of the 39.75" antenna without de-tuning the receiver; a unique feature of FMA Direct receivers. Reducing antenna length *will* reduce range, however. Proceed carefully, removing only a short amount at a time and be certain to ground range check the receiver with each incremental reduction in antenna length. **NEVER CUT THE ANTENNA SHORTER THAN 18 INCHES!** A special note to helicopter pilots concerning standard FM receivers and antenna placement: FMA Direct receivers are tested thoroughly in all types of aircraft including helicopters. Helicopters often create a challenge because they generate RF noise and heavy vibration from fast-moving parts. In order to improve reception in a helicopter, it is recommended that you route the antenna of the receiver as far away from the tail boom as possible. This is particularly true of carbon-fiber booms. Nylon push rod material mounted to the underside of the skids provides a good channel through which to route the antenna. When hooking up a servo to your receiver, use TABLE 1 and FIGURE 1 to check its plug wire color orientation.

RANGE TEST

To assure proper performance, the Magnum 8 series receiver must be range tested with the "host" transmitter. The major reason for this important test is that over time, all R/C transmitters are susceptible to de-tuning and frequency "drift". To ensure the utmost in secure RF reception, current technologies for narrow-banding used in FMA designs can actually place a higher demand on transmitters. Power level and frequency accuracy of your transmitter are more important than ever before. Therefore, for the initial range check and in rare cases when you suspect degradation of performance from your R/C system, FMA would like to suggest the following guidelines: Begin by placing the receiver on a cardboard box or another non-metallic surface to elevate it about 2 feet off the ground. Connect only one servo and the battery direct. Do not install a switch harness for the initial range test because switch harnesses are often the cause of poor range. Perform the range test with the receiver antenna fully extended VERTICALLY into the air on a dowel rod or the like, and the transmitter antenna collapsed. Apply power and walk away from the receiver moving one stick on the transmitter. You should obtain at least 200 feet of line-of-sight ground range if everything is operating properly. If any loss of servo control occurs, the system must be calibrated by an FMA service station. CALL (301) 831-8980 for FMA Direct technical assistance. In certain cases, the FMA service station may ask you to send in your transmitter along with your receiver.

ACCESSORIES:

Aileron extension cables, Y-harness, switch harness, and numerous other accessories as well as a full line of servos, batteries, chargers, and ARF airplanes are available for use with your FMA receiver either direct or from your local FMA dealer.