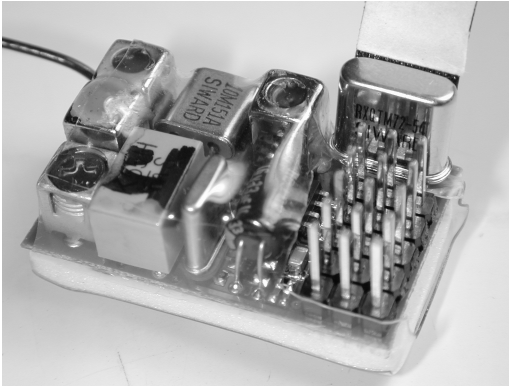


FMA Direct M5 Receiver



The FMA Direct M5 is an FM dual conversion five channel sub-micro receiver with impressive specifications. Just 1.3 inches long by 0.8 inches wide, it's 0.7 inches high with a foam protector on the back of the circuit board and shrinkwrap encasement. In addition to its small size it weighs just 0.3 ounce, and FMA Direct supplies the receiver with one of the lightest antennas we've seen.

If you're curious to see just how small the M5 really is, cut out the included multi-pane photo and fold it into a box shape. To get an idea of the weight, attach three pennies and a dime

inside before taping it together, but realize the result will be slightly heavier than the actual receiver and antenna combination.

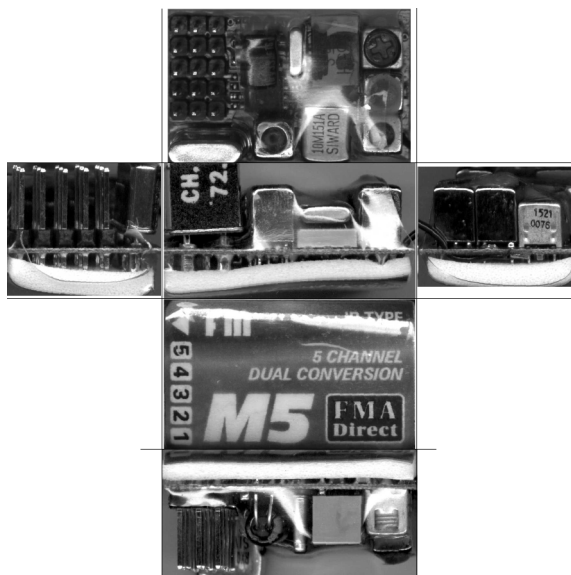
The M5 utilizes SMT (Surface Mount Technology) construction on a single glass-epoxy printed circuit board. The overall size has been reduced 22% from the FMA Extreme, and the volume is roughly 50% of the FMA Fortress Micro Universal receiver.

There are five sets of pins for servo connections. The battery, which can be any voltage between +3.5 and +16V, can utilize either a free servo plug or a Y-harness in conjunction with any one of the servos. The crystal sits against the pins for the fifth channel.

The M5 comes in two different versions — positive and negative shift — and is compatible with JR, Futaba, Ace, Hitec and Airtronics transmitters and servo plugs. (Older servos, specifically Airtronics, will need to be modified with new plugs.) This is a PPM receiver, and it is not PCM compatible.

The M5 looks very much like a modified Fortress Micro Universal receiver. The DIP pins which allow the Fortress to operate with both positive and negative shift transmitters are lacking on the M5. The servo pins on the M5 are oriented upward rather than protruding from the end of the receiver. A few parts, like the crystal, are in a different portion of the circuit board.

We do not have sophisticated testing equipment and our knowledge of electronics is fairly rudimentary, so our technical examination of the M5 consisted of comparing its range with that of a couple of other PPM



receivers. The range check was performed in our yard alongside a Hitec RCD 3600 and an FMA Direct Fortress Micro Universal. The instructions for the M5 state a range of at least 200 feet should be obtained with the transmitter antenna collapsed. We used our JR PCM 10 as a signal generator, but since we use a JR base loaded antenna, we had to remove the antenna completely.

All three receivers were placed on the back of a chair and the antennae were allowed to hang vertically. Pieces of masking tape were attached to the servo arms as flags. Transmitter in hand, we walked away from the bank of receivers and across the yard, watching the flag waving servos the whole time. We live in the midst of a fairly dense forest, so we walked until trees started getting in the way. Despite having no antenna at all on the transmitter, all three receivers were still going strong at 160 feet.

We've purchased one M5 for our JR transmitters (positive shift) and another for our Ace Silver Seven single stick transmitter (negative shift). We are currently in the process of modifying a tail-less A2 free flight glider for RC, and plan to use one in it. The light weight and small size of the M5 are very real benefits in this installation. We haven't decided where to use the other, but as FMA Direct states the M5 can be used in anything from an indoor model to IMAA quarter scale, we're able to keep our options open.

We need to reiterate a major point — the M5 is not a range-limited receiver suitable only for indoor use or for park flyers which will stay inside the confines of a football field. The M5 is a full range receiver with an extremely narrow bandpass, and as such it is suitable for just about anything you can build. It also sports failsafe to last good frame. Because of its extremely narrow bandpass and interference rejection capability, it should behave very well in a contest environment.

The M5 sells for US\$69.95 without crystal. The recommended reduced height crystal we've been using is US\$12.95; a standard height crystal is available for US\$10.95.

Visit FMA Direct on the web at <www.fmadirect.com>. You can order anything in the FMA Direct catalog by using the secure shopping cart on the site or by calling their toll free number 800-343-2934. Technical information and service can be reached at 301-668-7615. FAX 301-668-7619. FMA Direct is located at 5716A Industry Lane, Frederick MD 21704.

P.S.: About the Ace single stick transmitter we mentioned... FMA Direct also produces an RF board for the Ace Silver Seven Series transmitters. We were able to update our transmitter to FCC requirements by drilling four holes in the case, mounting the new RF board (2.5 x 1.5 inches) using the included standoffs, and connecting two Deans plugs. The included photo shows the completed installation. The update cost just US\$44.95 for the RF board and US\$12.95 for the transmitter crystal. Very cool.

(FMA M5 Specifications on following page.)



FMA DIRECT M5 SPECIFICATIONS

Size	1.30"L, 0.8"W, 0.58"H (0.7"H with foam & heatshrink case)
Weight	9 gm/0.3 ounces, 11 gm/0.4 ounces
Design	Dual conversion, super heterodyne
Special circuitry	Microprocessor controlled decoder
Channels	1 through 5
Modulation	FM/PPM (Pulse Position Modulation)
Frequency	RC Channels 11-90, U.S. legal 72 and 75 MHz
Ultimate bandpass	± 8.5 KHz @ >55dB down
Usable sensitivity	>-95 dBm
3OIP	+9 dBm
Failsafe	to last good frame
Operating voltage	+3.5V to +16V DC, limited only by servo requirements
Current draw	19 ma
Legal use	Meets AMA guidelines and FCC 1999 radiation requirements