CRESCENT RADIO CONTROL

SPECIALISTS IN
PROPORTIONAL CONTROL

If you want the best, buy Crescent

GLASS CITY MODEL ELECTRONICS
BOX 2864, STATION B
TOLEDO, OHIO

CATALOG NO.

PULSE PROPORTIONAL CONTROL

History and Operation

The use of pulsed electrical signals to obtain control functions is very definitely not new. We could construct an analogy with the telegraph operator who transmits a message in Morse code to another operator who receives the message. The second operator deciphers and interprets the code and completes the action asked for by the first telegraph operator. We do much the same thing when using pulsed electrical signals to operate our radio control equipment. In place of the first telegraph operator we use a mechanism that will continually send out a predetermined code and in place of the second operator we use a servo or other mechanism to decipher or interpret the code and perform the requested action. It is as simple as that.

No one knows for certain who first thought of using a pulsing system to operate a radio control model, but history has it that it went way back before World War II. During the war, the German army experimented with it as a guidance system for their now famous (or infamous) V-1 Pulse Jet Buzz Bomb. It was picked up by the modelers in the United States after the war and has been used very successfully with an ever increasing following ever since. The one big problem was the lack of reliable equipment available to the average modeler. This problem has now been surmounted by the introduction of the "Crescent" line of Pulse Proportional Equipment manufactured by Glass City Model Electronics.

Two methods of coding the pulse are in common use in the United States today. The first, and by far the most popular, is the pulse width or mark-space ratio method. With this method the ratio of the length of time the signal is turned on to the length of time the signal is turned off is varied to achieve a control function.

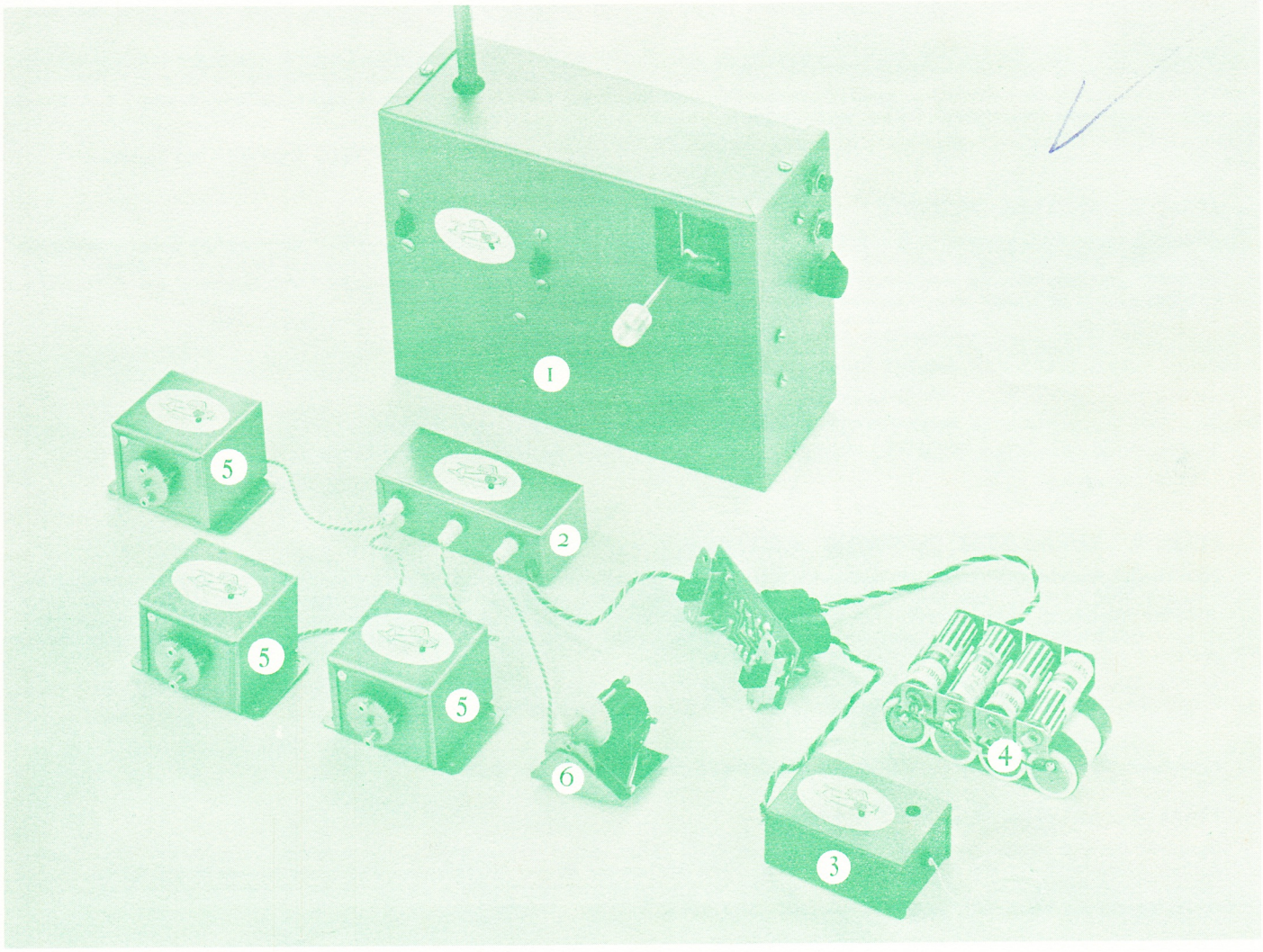
To further explain how it works, let us assume that we have our equipment wired in such a manner that when a signal is transmitted the rudder will go into full left position and when the signal is turned off the rudder will go into full right position. If we turn the signal on and off for exactly equal lengths of time, the rudder will turn the model first to the left and then to the right and back to left and back to the right. The result will be that the model will weave back and forth but will fly in a straight line. Now, by increasing the speed that we send the pulses, we can eliminate the weaving and control our model in a straight line. You can readily see that by varying the ratio of signal on to signal off you can make your control favor either left or right position in a truly proportional manner. The "Crescent" Universal Pulser controls this function by a left and right movement of the spring loaded control stick.

The second method uses changes in pulse speed to obtain the control function. Although this method is not as popular nor as simple as the mark-space ratio method, it is equally as good for pulse proportional control. With this method we establish a predetermined pulse length which we do not change. Using a predetermined pulse length we must increase and decrease the speed that we transmit the pulse to achieve the desired control function. In effect, we are bringing the pulses closer together and pushing them further apart by changing the speed of pulsing. This function is controlled by the forward and backward movement of the spring loaded control stick in the "Crescent" Universal Pulser.

Both the mark-space ratio and the pulse speed methods of control can be transmitted and received simultaneously on one single radio channel making it possible to obtain fully dual simultaneous proportional control of two control functions, such as rudder and elevator. Other control functions, such as motor control, may be added easily to this equipment. Glass City Model Electronics now has all of the necessary equipment for this control system available to the model builder at a reasonable cost.

This is the

SEPARATE SERVO "MULTIPLEX MASTER"
Proportional Radio Control



The same simple easily maintained simultaneous proportional control system as the "Master Multiplex" with the servos and the decoder section individually cased to allow the model builder a choice of installation. The separate servo "Master" allows a versatility not found in other systems. It may be a build-up system starting with rudder + trimmable motor control or class I competition with proportional rudder and fully proportional throttle or class II competition with proportional rudder and elevator + trimmable throttle or full house with rudder, aileron + elevator + trimmable throttle with steerable nose wheel + brakes + ?. All systems are **FAIL SAFE.** This **is** a pulse system and a slight quiver of the control surfaces is evident in operation. All wiring is complete. Just plug it together and it is ready to operate.

This is quality proportional at a price you can afford.

Deluxe set includes "Master Pulsmitter", "Master Decoder", 3 Master Proportional Servos, Trimmable Motor Control Servo, Pulsmaster Receiver, Master Battery Pack, Master Field Charger and Master Service Kit.

At Selected Hobby Dealers or order direct.

Deluxe Superhet Set	$224.95
Deluxe Super regen Set	196.95

Send 50 cents for catalog and descriptive literature on the "Master"

GLASS CITY MODEL ELECTRONICS • P. O. Box 2864, Sta. B • TOLEDO, OHIO

ITEM 1 THE MASTER PULSMITTER

Hi power all transistor tone transmitter combined with the proven design mechanical pulser to provide high power, perfectly linear pulsing with absolutely no drift within a pulse speed range of 2 to 30 pps.

Single control stick action controls both pulse rate and pulse width for rudder and elevator action to provide the most realistic feel and performance in flight. Elevator trim control is provided for perfect flight maneuvers.

Light weight and small, size 8 x 6 x 3, with new "cradle balance" design for ease of handling and effort free flying.

Advance and retard throttle buttons located to be operated with the left hand eliminates the need to let go of the stick when operating the throttle.

Designed for the "Master Multiplex" but excellent for all pulse control systems such as Galloping Ghost, Simple Simul and most rudder only controls.

Specifications: Size 8 x 6 x 3 ★ Battery requirements, one 9 volt Burgess D6 or equal and one 6 volt screw terminal lantern battery ★ Current drain 9 volt transmitter 45 mills, 6 volt pulser 150 mills. Battery sizes selected for low cost and extra long life ★ Transmitter output radiated power approximately 135 milliwatts ★ 95% modulation ★ 700 cycle tone (approx.) ★ Antenna center loaded and individually peaked for most power.

Price **$59.95** less batteries

ITEM 2 MASTER DECODER

A development of 10 years of active R/C flying. A completely self contained decoding unit that sorts out the coded information transmitted from the Master Pulsmitter and applies it to the proper servo to follow your commands in flight. Will provide two separate and simultaneous proportional commands and one selective position (trim) command. All functions are **FAIL SAFE.** Provides control of rudder aileron (coupled) + elevator + motor control or any combination.

★ Completely wired and tested. Just plug in and operate

★ Requires little to no maintenance for hundreds of flights

★ No interaction between controls

★ Rugged printed circuit with high power transistor relay triggers.

Specifications: Size 3⅝ x 1½ x 1¼. Weight 4¼oz. Battery Drain approximately 40 mills (taken from servo batteries).

Price **$34.95**

ITEM 3 PULMASTER SUPERHET RECEIVER

New design superhetrodyne receiver with very high noise rejection level required for proper pulsing and fail safe operation of the "Master Multiplex" or other pulsing servos. Special hardened relay and high speed relay trigger circuit for completely linear drift-free operation. Fully temperature compensated with efficient A.G.C. circuit for consistant operation up close or at maximum range. Good adjacent channel rejection combined with maximum sensitivity for best range. Single tuning slug for simplicity of operation. Comes complete with plug ready to operate.

Specifications: Size 1 x 1¾ x 2½ ★ Weight 2½ oz. ★ Battery requirement 6 volt (part of Master battery pack) ★ Current drain 9 mill idle, 50 mill on signal. Standard frequency 26.995, others available on order.

Price **$59.95**

Pulsmaster Super regen receiver (3 volt operation) $29.95

ITEM 4 MASTER BATTERY PACK

Designed for the Master Multiplex. Contains four 1200 MAH sealed rechargeable nickle cadmium batteries plus the required battery complement for the receiver you are using. Will operate the Master Multiplex for 1½ hours of dependable flying between charges. Operating time may be extended greatly by charging between flights with the Master Field Charger. Battery pack comes completely wired with plug ready to use. Size 3⅞ x 3 x 1⅞. Weight 10 oz.

Price **$25.95** complete

ITEM 5 MASTER PROPORTIONAL SERVO

A simple proportional servo with an efficient wrap up type spring neutral for fast smooth control reaction. 49-1 gear ratio provides adequate power for most R/C models yet gives fast precise control response. Dual push rod connections are provided to allow the servo to be used for aileron control or to connect rudder and steerable nose wheel without complicated linkage. Current drain 150 mills RMS during operation. Servo comes complete with wiring and plug.

Price **$11.95**

ITEM 6 MASTER TRIMMABLE THROTTLE SERVO

A simple positionable throttle servo for medium to fast throttle operation. Comes complete with wiring and plug to be used with the Master Decoder.

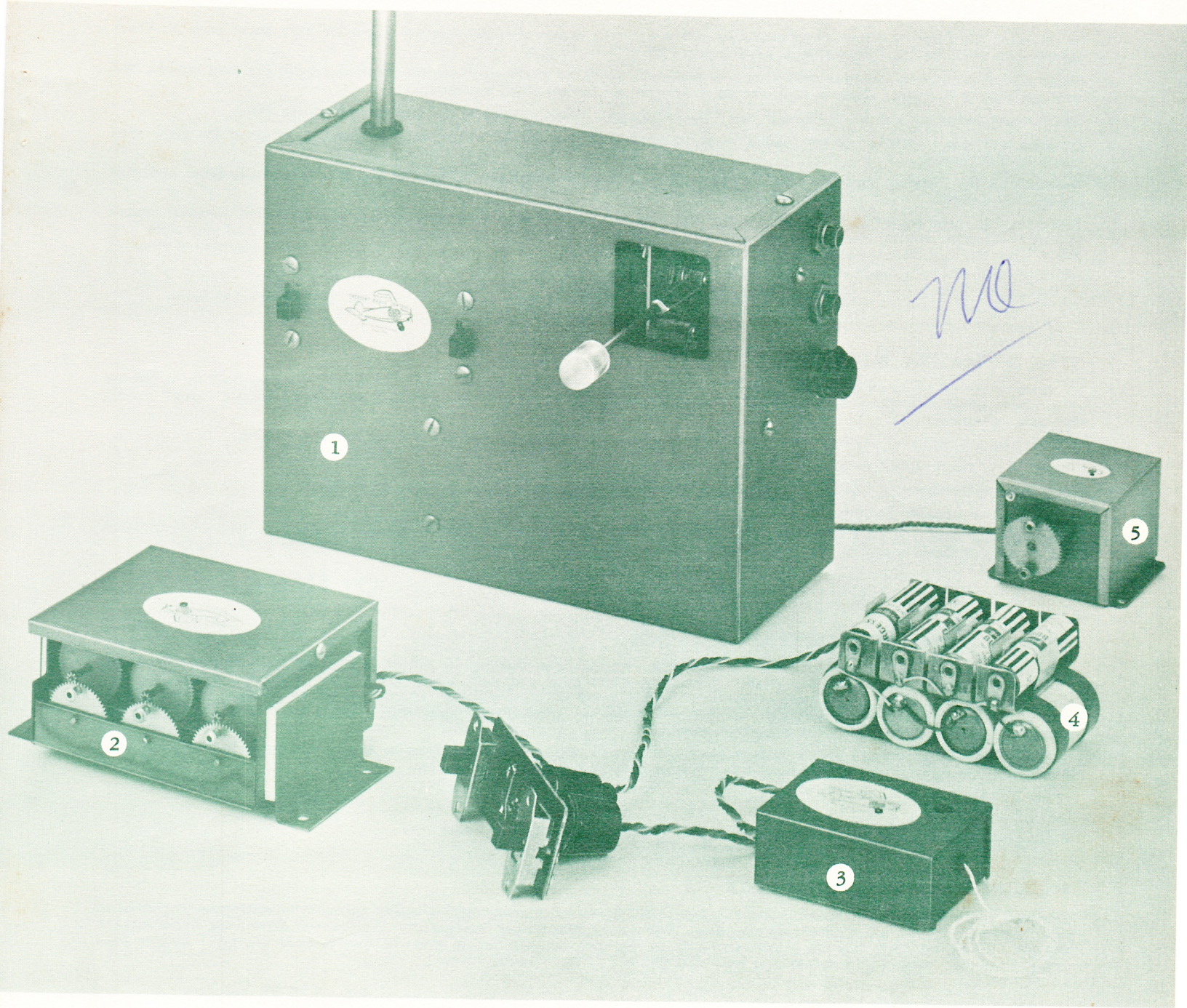
Price **$9.95**

ITEM 7 MASTER FIELD CHARGER (not shown)

Special design charger to be used at home or at the field. Operates from 12 volt car battery. Long cord provided to reach model. Output of 120 mills for properly charging Master battery pack. Includes charge indicator light to show operation.

Price **$3.95**

GLASS CITY MODEL ELECTRONICS • P. O. Box 2864, Sta. B • TOLEDO, OHIO



This Is The "MULTIPLEX MASTER" For Radio Control

A simple Dual Simultaneous Proportional Control System **with new waggle-free servos** with adequate servo power to fly most R.C. models + built-in fail safe feature. This **is** a pulse proportional system and a slight quiver of control surfaces is evident during operation. Basic set includes hi-power all transistor transmitter-mechanical pulser combination (Master Pulsmitter), + rudder, elevator, motor control servo pack (Master Multiplex), + heavy duty rechargeable servo battery pack (Master Battery Pack) + regen or superhet "Pulsmaster" receiver + battery charger + service kit. All wiring is complete — just install and fly. Built by "Glass City" with 10 years of proportional experience.

Proportional at a price you can afford.

At selected hobby dealers or order direct. (Send 50 cents for catalog and technical literature on the "Master".)

Superregen Set	174.95
Superhet Set	199.95
Aileron Servo	11.95 additional

GLASS CITY MODEL ELECTRONICS • P. O. Box 2864, Sta. B • TOLEDO, OHIO

ITEM 1 THE MASTER PULSMITTER

Hi power all transistor tone transmitter combined with the proven design mechanical pulser to provide high power, perfectly linear pulsing with absolutely no drift within a pulse speed range of 2 to 30 pps.

Single control stick action controls both pulse rate and pulse width for rudder and elevator action to provide the most realistic feel and performance in flight. Elevator trim control is provided for perfect flight maneuvers.

Light weight and small, size 8 x 6 x 3, with new "cradle balance" design for ease of handling and effort free flying.

Advance and retard throttle buttons located to be operated with the left hand eliminates the need to let go of the stick when operating the throttle.

Designed for the "Master Multiplex" but excellent for all pulse control systems such as Galloping Ghost, Simple Simul and most rudder only controls.

Specifications: Size 8 x 6 x 3 ★ Battery requirements, one 9 volt Burgess D6 or equal and one 6 volt screw terminal lantern battery ★ Current drain 9 volt transmitter 45 mills, 6 volt pulser 150 mills. Battery sizes selected for low cost and extra long life ★ Transmitter output radiated power approximately 135 milliwatts ★ 95% modulation ★ 700 cycle tone (approx.) ★ Antenna center loaded and individually peaked for most power.

Price **$59.95** less batteries

ITEM 2 MASTER MULTIPLEX

A development of 10 years of active competition flying. Low cost 3 servo pack with all electronic circuitry built in to provide true simultaneous proportional control of rudder (rudder aileron) and elevator + fully selective positionable throttle control + fully fail safe operation.

Unit comes completely wired and tested, just plug in the battery pack and receiver and you are ready to operate.

Torsionally shock mounted to absorb most vibration.

Very little maintenance is required to keep unit in top operating shape for many hundreds of flights.

No interaction between controls.

Specifications: Size 3⅞ x 3 x 1⅞ ★ Weight 10 oz. ★ Battery drain 320 MA RMS ★ Battery requirements, Master 1200 MAH battery pack ★ Servo power, all servos geared 49 - 1 to provide adequate power for most R/C models now on the market.

Price **$54.95**

ITEM 3 PULSMASTER SUPERHET RECEIVER

New design superhetrodyne receiver with very high noise rejection level required for proper pulsing and fail safe operation of the "Master Multiplex" or other pulsing servos. Special hardened relay and high speed relay trigger circuit for completely linear drift-free operation. Fully temperature compensated with efficient A.G.C. circuit for consistant operation up close or at maximum range. Good adjacent channel rejection combined with maximum sensitivity for best range. Single tuning slug for simplicity of operation. Comes complete with plug ready to operate.

Specifications: Size 1 x 1¾ x 2½ ★ Weight 2½ oz. ★ Battery requirement 6 volt (part of Master battery pack) ★ Current drain 9 mill idle, 50 mill on signal. Standard frequency 26.995, others available on order.

Price **$59.95**

Pulsmaster Super regen receiver (3 volt operation) $29.95

ITEM 4 MASTER BATTERY PACK

Designed for the Master Multiplex. Contains four 1200 MAH sealed rechargeable nickle cadmium batteries plus the required battery complement for the receiver you are using. Will operate the Master Multiplex for 1½ hours of dependable flying between charges. Operating time may be extended greatly by charging between flights with the Master Field Charger. Battery pack comes completely wired with plug ready to use. Size 3⅞ x 3 x 1⅞. Weight 10 oz.

Price **$25.95** complete

ITEM 5 MASTER PROPORTIONAL SERVO

Used for electrically coupling ailerons to the Multiplex. One pair (two wired) are all that are needed to connect the "Master Proportional Servo" to the Multiplex. Servo will fail safe with the rudder servo in the "Master Multiplex." Dual push rod connections are provided for strip-type aileron installations. Efficient wrap-up type spring neutral provides logrithmic control action for fast smooth control.

Price **$11.95**

ITEM 6 MASTER FIELD CHARGER (not shown)

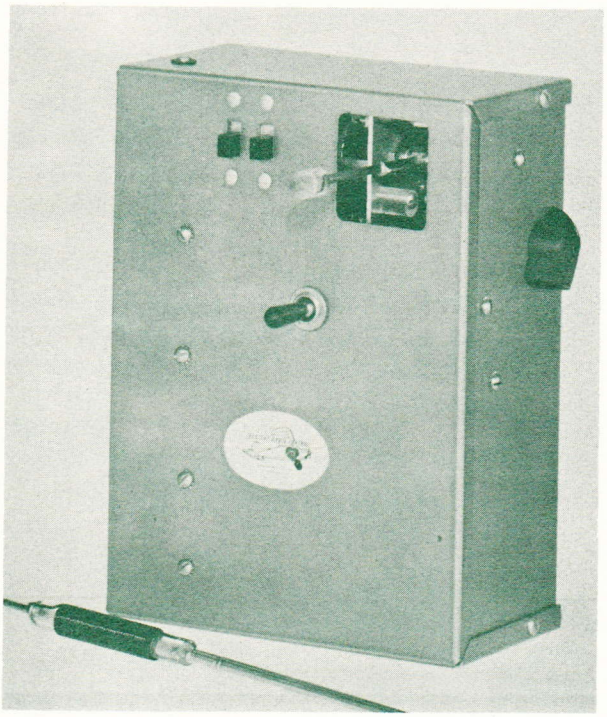
Special design charger to be used at home or at the field. Operates from 12 volt car battery. Long cord provided to reach model. Output of 120 mills for properly charging Master battery pack. Includes charge indicator light to show operation.

Price **$3.95**

GLASS CITY MODEL ELECTRONICS • P.O. Box 2864, Sta. B • TOLEDO, OHIO

TWO GREAT NEW PROPORTIONAL TRANSMITTERS

FROM GLASS CITY MODEL ELECTRONICS



MK II PULSMITTER

MK II Pulsmitter

Hi-power all transistor tone transmitter combined with proven mechancial design pulser to provide high power perfectly linear pulsing with absolutely no drift within a Pulse speed range 02-28 pps.

- Control stick action controls both pulse width and pulse rate plus pulse rate trim control for trimming elevators in flight.
- Light weight and small size 8 x 6 x 3 for ease of handling.
- Can be used for all common pulse systems such as rudder only, galloping ghost, simple simul and the multiplex.
- Ideal companion for the multiplex.
- Lever switch for motor control.

At Your Favorite Dealer or Direct **59.95**

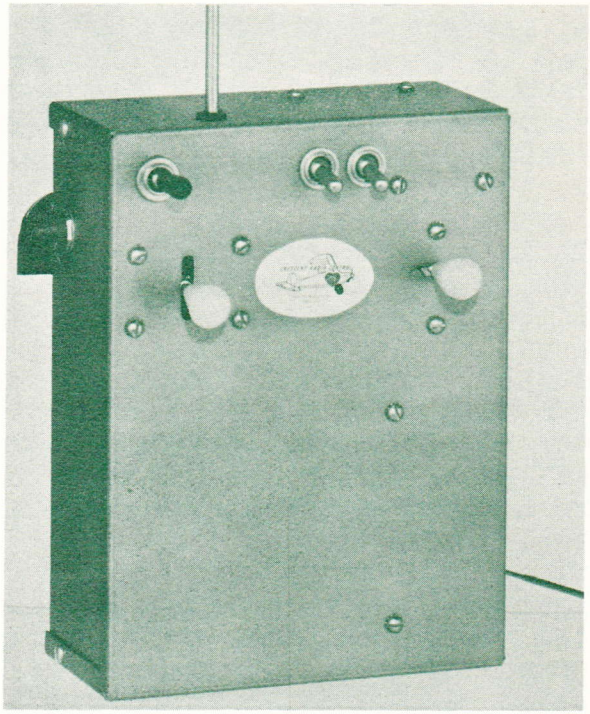
• Less Batteries

Duplex Pulsmitter

Same Hi-power all transistor tone transmitter as MK II model pulsmitter • Same linear drift free mechanical design with the Pulser split into two separate functions to provide lever type fully proportional control of two separate controls (such as rudder and elevator) • Each function independent of one another • Elevator trim control provided for in-flight trim • Contains lever switch for motor control • Small size 8 x 6 x 3 and light weight for ease of handling.

At Your Favorite Dealer or Direct **59.95**

• Less Batteries



DUPLEX PULSMITTER

Glass City Model Electronics

P.O. BOX 2864 • STATION B • TOLEDO, OHIO

FLYING A TRUE PROPORTIONAL SYSTEM

The target of achievement for most radio control modelers is to fly his radio control model with the precision and grace of a full size aircraft. This achievement is possible only if the control functions of his radio control equipment very closely simulate that of its full size counterpart. This close assimilation is now possible with Glass City Model Electronics "Proportional" radio control systems.

Many years of research, development and refinement have gone in to the Glass City line of "proportional" radio control equipment. The equipment we offer in this catalog is the culmination of this experience. It will offer you a most reliable realistic control of your radio controlled model at a cost considerably less than competitive full throw type control systems.

Flying your model with a control stick rather than push buttons or levers will be an exciting new experience for you. You will now have that full and complete control to make very smooth realistic maneuvers. Now you will be able to make those truly proto take-offs and landings. Picture this. You start your engine and retard the throttle to idle position. Step back a step or two and check your controls for proper operation. Trim your elevator, with the elevator trim control on the right side of your Pulsmitter, to take off and climb position (slight up trim). Advance the throttle slightly and taxi out (you have steerable tail wheel, of course). Turn downwind and taxi to the end of the runway. Retard the throttle to idle and stop. Recheck all controls (this is good practice any time). Clear the area to see that no one else is landing. Advance the throttle slightly and taxi out on the runway. Now advance the throttle to full and immediately apply right rudder (engine torque will pull the model to the left). As speed picks up, relax slightly on the right rudder and apply a little down elevator and hold it to raise the tail off the ground. Keep it running down the runway in a straight line by applying small amounts of controls. As you reach flying speed, gently pull back on the control stick, and you are airborn. Almost immediately after breaking ground, relax the back pressure on the control stick and let the climb trim take over for the climb out. After you reach your maneuvering altitude, crank in some down trim until your model flies straight and level. Now you start your maneuvers. With a little practice you can do all the maneuvers in the A.M.A. rule book, and you will be able to do them smoothly with full control at all times. After you have finished your maneuvers, you retard the throttle and start your landing approach. As you retard the throttle you will start to crank in up trim in the elevator to slow your model down to the correct approach speed. Make your downwind pass, turn onto base leg of your landing pattern, then turn onto final approach. Use your elevator very gently on the turns to keep your approach speed constant and well above the stall point of your model. Line up on the runway. You come over the boundry at about the feet of altitude and begin your flareout. Allow your model to descend to 5 ft. then 2 ft. then start easing back on the control stick. Not too much now or you will float back up. Keep feeding in up elevator. At about the same time you get the stick all the way back, your model will touch down in a perfect 3 point landing. Let her roll out until it loses enough speed to turn it safely to taxi. Now taxi back to your starting point, retard the throttle to idle and stop the engine. You have just completed one of the most realistic flights imaginable with a model airplane.

Flying like this takes practice. Radio control flying is a skill the same as flying a full-size airplane. You must expect a little misfortune and a few "prangs" until you become familiar with your equipment and acquire the necessary practice to become a skillful flier.

Improved

Better Than Ever

Mark III

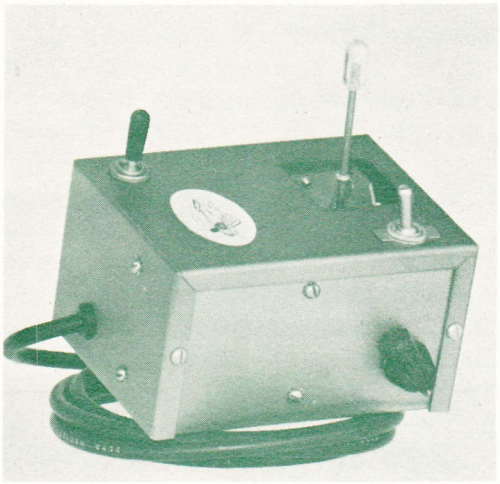
CRESCENT UNIVERSAL PULSER

The Crescent

Mark III

Universal Pulser

Now Combines The Best Qualities Of Both Mechanical & Electronic Designs



STILL $29.95

THE ONE PULSER FOR ALL PULSE PROPORTIONAL WORK

- PROVEN — Nationals winning mechanical design, controls both pulse width & pulse rate.
- PROVEN — The mechanical pulser with the relay key for cleaner sharper pulsing.
- PROVEN — Reliability, maintains adjustments & operates faultlessly after months of hard use.
- PROVEN — Economy - Months of normal operation on one set of inexpensive flashlight batteries.
- PROVEN — Works with all popular pulse proportional control systems such as rudder only, galloping ghost, simple-multi, and the Crescent Multiplex.
- PROVEN — Maintains absolute linearity over entire speed range, mechanical design will not allow it to drift. Speed range 2 to 30 P.P.S.
- Control stick spring loaded & completely self neutralizing. It puts the "Feel" in flying.
- All controls are adjustable & once adjusted will stay where you put them.
- Housed in a 5 x 3⅝ x 2¾ green aluminum case that may be attached to a hand held transmitter or plugged into a ground plane type transmitter.
- Not a kit - Comes assembled, tested and ready to go.

THIS IS THE ANSWER TO YOUR PULSER PROBLEMS

ORDER YOURS FROM

GLASS CITY MODEL ELECTRONICS

Box 2864 Sta. B
Toledo, Ohio

Michigan Residents
Please include
4% State Sales Tax

MAINTENANCE NOTES
FOR RADIO CONTROL EQUIPMENT

We cannot over emphasize the need for periodic and adequate maintenance on radio control equipment. Good maintenance habits can predicate the success or failure of your radio control equipment to operate to your satisfaction. Many malfunctions of R. C. gear are incorrectly blamed on poor equipment design when in reality it is a lack of understanding and poor maintenance of the equipment that causes the failure. In the following paragraphs we will cover some generalities and precautions to be taken to assure yourself of trouble-free operation.

The really simple things are sometimes completely overlooked in the general maintenance of an R. C. model. The most common troubles lie in broken wires, faulty plugs and switches, dead or near dead batteries or battery holders that are loose or have corroded contacts. One of the simplest yet most common causes of malfunction is poor, inadequate tuning of the receiver to the transmitter. This one may seem hard to believe, but we have found it to be true in many cases.

Broken wires are a real bugaboo. They usually show up after a model has been flown for some time, but may occure before the model ever gets to the flying filed. A broken wire in many cases cannot be seen. It is broken inside the insulation about a quarter inch away from a solder connection. This type break often causes intermittent operation and vibration trouble. Loose or "cold" solder joints will react the same way. Broken wires can be found by pulling gently on each wire until you find one on which the insulation stretches. This will be your broken wire. In most installations, wires should be kept as short as practical and securely anchored at least a half inch behind each solder joint to stop flexing due to vibration. Certain types of commercially available liquid rubber or "Goo" can also be used to anchor the wires at the solder joint.

Faulty or worn plugs are also a hazard to proper R. C. operation. Plugs, after much use, will become so loose that they will make improper or intermittent contact and may even fall out. Badly worn or otherwise faulty plugs are often the source of vibration troubles. The best course of action in the case of a bad plug or socket is to replace it. Plugs should always be anchored securely in their sockets to make sure they don't vibrate out when the model is in the air.

Switches are one of the worst hazards. A large, heavy switch is not always the answer. Slide switches are the most commonly used switches for R. C., and are the cause of the most trouble. Most slide switches are open on the ends. Dirt, oil and other foreign material can get into the switch and contaminate contacts causing faulty operation. They can also coat the contacts allowing the switch to be turned on but creating a high resistance across the contact that will cause your receiver or servo to operate as tho the batteries were run down. A slide switch is a relatively simple mechanism, and can be disassembled, cleaned, adjusted

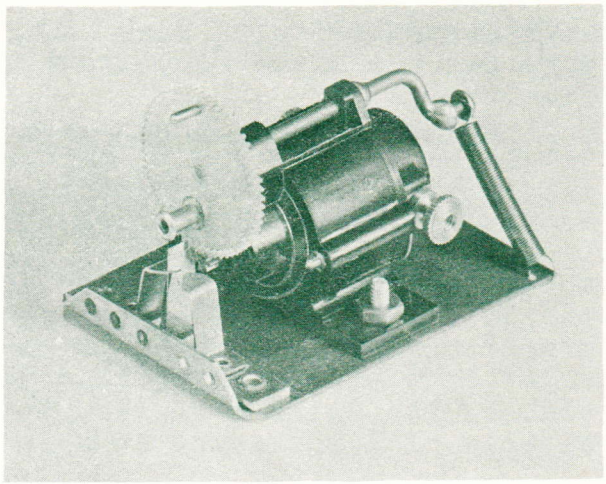
Continued on page 7

The "Crescent" "Go-Around" Proportional Servo

THIS ONE SERVO GIVES YOU SELECTIVE PROPORTIONAL RIGHT & LEFT RUDDER + SELECTIVE POSITIONABLE MOTOR CONTROL + COMPLETELY FAIL SAFE OPERATION.

FULL PRICE

$8.95



GLASS CITY MODEL ELECTRONICS BOX 2864 STA B Toledo, Ohio

Please Include Check or Money Order With Your Order

HOW IT WORKS

Mount your GO-AROUND SERVO on a bulkhead in your model with the base of the servo toward the front and the motor shaft in a vertical position with the gear end on top. The servo may be contact cemented or bolted in place. The servo may also be mounted on the side of the model. The only change you must make will be changing the location of the little striker pin. The pin is simply pulled out and pressed into the auxiliary hole provided in the gear. Normally, no adjustment will be necessary for the centering spring. If you feel adjustment is necessary, you can tighten the spring by removing loops. If it is too tight, stretch it slightly. Wire your servo per wiring diagram shown. Observe servo motor polarities so that when the GO-AROUND SERVO is stalled against one contact the motor control servo is operating on the opposite set of batteries. Start your pulser. It may be operated anywhere between 4 & 12 pps. with equal results. Your radio equipment will determine its most desirable speed. Adjust the pulse width ratio on your CRESCENT MARK II UNIVERSAL PULSER or PULSMITTER so that you get control reactions per sketches 2, 3& 4, and you are ready to go. This servo FAILS SAFE. When no signal is present, it will return the rudder to neutral and retard the throttle. Selective trimmable (any position) motor control may be had with the GO-AROUND SERVO when used with the CRESCENT MOTOR CONTROL SERVO. Note: Light weight, very freely operating push rods and control surfaces must be used with the GO-AROUND SERVO.

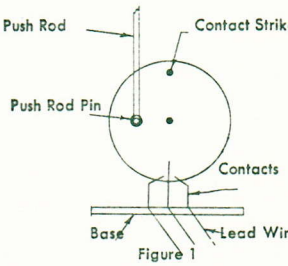


Figure 1
Front View of Servo

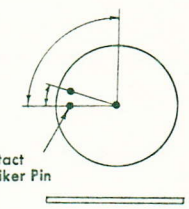


Figure 2
Full Right Rudder
Pulser Pattern

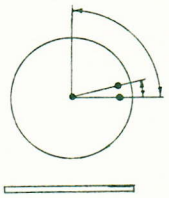


Figure 3
Full Left Rudder
Pulse Pattern

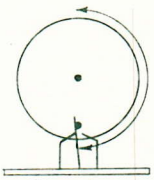
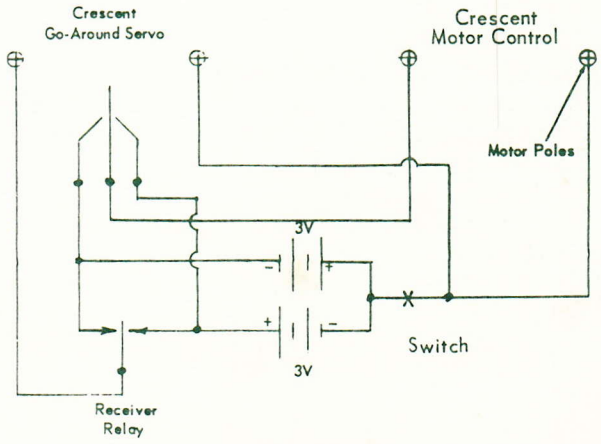


Figure 4
No Signal Position
Retard Engine Control
Full Signal Opposite



GLASS CITY MODEL ELECTRONICS

MANUFACTURERS OF
QUALITY RADIO CONTROL

BOX 2864 STA. B
TOLEDO, OHIO

and reassembled with very little trouble. Watch your switches closely, they can cause you much trouble.

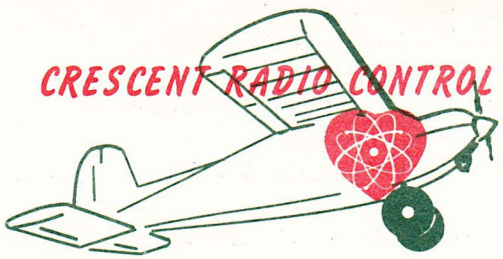
Batteries have always been a problem. With the development of the newer low voltage all transistor receiver, much battery trouble has been eliminated. The introduction of nickle cadmium batteries and power converters have also helped the battery problem. If you use ni-cads, it is always best to solder them directly in to the circuit and forget about battery boxes. If you must use battery boxes, they should be periodically cleaned and checked for corrosion on the contacts and for proper contact pressure. Zinc carbon batteries should always be checked under load before using them even if they are brand new. In some cases, zinc carbon cells will show proper voltage with no load but will not be capable of maintaining it when a load is applied.

Proper receiver tuning is often overlooked as a source of trouble but is more often than not the cause of poor range and improper operation. You should always follow the manufacturers recommendations as closely as possible. If you are new at the game, try to get help from a more experienced R. C. modeler. It is always good practice to check receiver tuning before each flying session. It may take a little time, but it may save you a crack up. Loose componnents in a receiver and especially a loose tuning slug that will vibrate out of position can also cause very serious trouble.

Glass City Model Electronics Pulse Proportional R. C. gear is built around basic mechanical principles. A mechanical function in this application is generally superior to it's electronic counterpart in that it is not subject to temperature, humidity and voltage variations. Once it is adjusted, it will retain it's setting for an indefinite period of time. As with any mechanical function, although, it will require a limited amount of maintenance.

Proper lubrication is the most important single item to consider in the successful use of a mechanical unit. Adequate lubrication is a must but <u>over</u> lubrication can be just as serious a problem as no lubrication at all.

A great deal of time has been spent by Glass City Model Electronics on testing and developing the correct materials for the different applications in the Crescent mechanical R. C. system. For instance, the material used for the wiper in the Crescent Universal Pulser and Pulsmitter is a special type stainless steel selected to give uniform action with a very low rate of wear. If the recommended graphite lubricant is used in a conscientious manner, the wiper will wear for several seasons before it is necessary to replace it. It then can be replaced at a cost of 50 cents.



GLASS CITY MODEL ELECTRONICS
BOX 2864 STATION B
TOLEDO, OHIO

SIMPLE-MULTI

The simple-multi system is designed for the Sunday flyer who has good single channel radio equipment, would like to get into multi channel and does not wish to spend the large sum of money for all new equipment. This system will give him proportional right and left rudder and selective up and down elevator. The rudder control and elevator control are entirely selective, there is no sequence to go thru. When he gives a control command, he will get just what he commands. Another important feature of the system is the speed of control. It is just as fast as any multi system, and faster than some. This system (simple multi) is in the Intermediate classification in the A.M.A. rules.

HOW IT WORKS

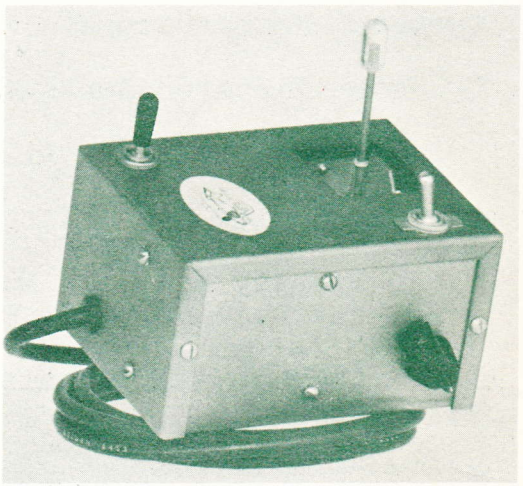
The entire system is designed around the "Crescent" mechanical pulser and the "Crescent" "Go-Around" servo. These two items plus your present single channel radio equipment and one standard Mighty Midget motor is all that is required.

First set up your "Go-Around" servo per the instruction sheet. You may use either the push rod or torque rod for rudder control. Wire in the Mighty Midget elevator servo per the wiring diagram on this sheet and install the elevator linkage per your perference using either torque rod or push rod. The Mighty Midget elevator servo must have stops affixed to the large gear so as to limit the rotation to 180°. Attach a neutralizing rubber band to the elevator servo and adjust the tension so that it will return the servo to center but will allow the servo to go to full position when power is applied.

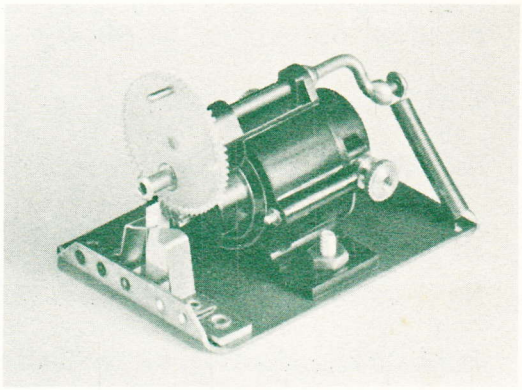
With the servo and receiver installation complete and the batteries in place, you will note that with the rudder servo switch off both servos will remain in neutral. When the rudder servo switch is turned on and no signal is being given the receiver the rudder should go around thru right rudder position and back to neutral. When the "Go Around" servo hits it's contact lever it will close a set of contacts that should give you up elevator. If you get the wrong control, reverse the wires on the servo motor. After you have this operating correctly, turn on your receiver and send a solid signal to it from your transmitter. The receiver relay should pull in and hold. The "Go-Around" servo will then go thru left rudder position and strike the contact lever again but in the opposite direction. This should give you neutral rudder and down elevator. Now turn on the pulser. The "Go-Around" servo should start oscillating and should go to center or top neutral position, as shown on the "Go-Around" instruction sheet. Move the control stick on your "Crescent" pulser to the right until you get full right rudder and adjust the cradle stop screw on the pulser for this position. If you go too far, the "Go-Around" servo will go beyond full right position and bump the up elevator contact. Repeat this adjustment for left rudder position. When the mechanism is adjusted correctly, no matter what rudder position you are holding, when you press the black button (no signal) on the pulser, the rudder will go to neutral and you will get up elevator. When the red button is pushed you will get neutral rudder and down elevator.

As both servos are operated in a stalled condition when a full control is given, it is best to double check your wiring to insure that both servos do not stall using the same set of batteries at the same time. This condition can be checked by removing one set of servo batteries and transmitting a signal. If the "Go-Around" servo strikes the contact and does not move the elevator servo, the system is wired correctly. Improper wiring can be corrected by reversing wires on the receiver relay and/or on the servos.

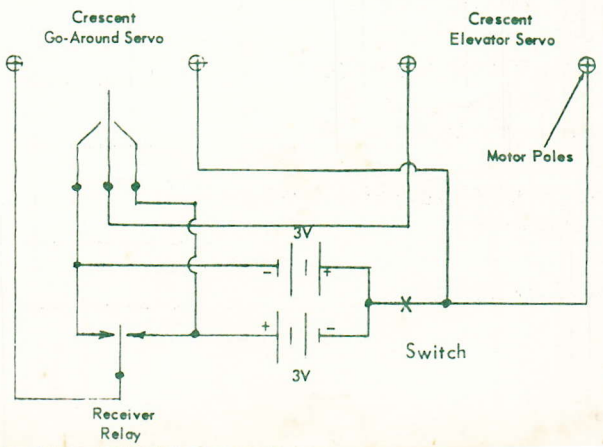
Flying is very simple as your airplane will fly just as it did on rudder only until you give it a signal for up or down elevator. After some practice and using a good airplane design you can accomplish almost all the A.M.A. Radio Control stunt maneuvers with this system. Motor control may be added simply and inexpensively. Ask about the Crescent "Simple Multi" motor control unit.



Crescent Pulser $29.95



Crescent "Go-Around" Servo $8.95



ORDER SHEET
RECOMMENDED EQUIPMENT
FOR PULSE PROPORTIONAL CONTROL

_____ Crescent Mark III Universal Pulser - 29.95

_____ Crescent Mark II Pulsmitter less batteries - 59.95

_____ Crescent Duplex Pulsmitter less batteries - 59.95

_____ Mark II Multiplex Multi Proportional Servo Pack - 49.95

_____ Crescent Go-Around Servo - 8.95

_____ Crescent Motor Control Servo - 8.95

_____ Crescent Elevator Servo - 8.95

_____ Crescent Proportional Aileron Servo - 13.95

_____ Min-X Powermite Transmitter - 34.95

_____ Wired Battery Pack for Multiplex - specify for 3 volt or 6 volt receiver - 25.95

_____ Min-X Compact all transistor Tone Receiver (special for pulse work) - 29.95

_____ Min-X Convertible all transistor receiver 6 volt (special for pulse work) - 39.95

_____ Superhet Single Channel 6 volt (special for pulse) receiver - 59.95

_____ 100 ohm miniature relay (Gem or O & S) - 3.95

_____ Mighty Midget Motor - 2.95

_____ Burgess CD 9 900 M.A.H. Ni-Cad Battery - 5.50

_____ New 1200 M.A.H. Ni-Cad Battery - 5.50

_____ Pen Cell size Nickle Cadmium Battery - 2.75

All orders will be shipped parcel post, postpaid within the Continental United States. Please allow 7 to 10 days from date of order for parcel post delivery.

No. Items Ordered _____

Total Price _____

Sales Tax (Mich. res. add 4%) _____

Total Price _____

SHIP TO

_____

_____

_____