PACT MODEL 1 XP
Users Manual
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Your PACT Model 1 XP combines the solid chronograph features of our original Model 1, along with the advanced Glint Guard^2 bullet detection system and MKVI Sky Screens found on the PACT Professional Chronograph XP. You'll find that your Model 1 XP will deliver no hassle reliable velocity readings for years to come. However, like any machine, to get the most out of your PACT chronograph, it's worth taking a few minutes to get yourself up to speed on the details.

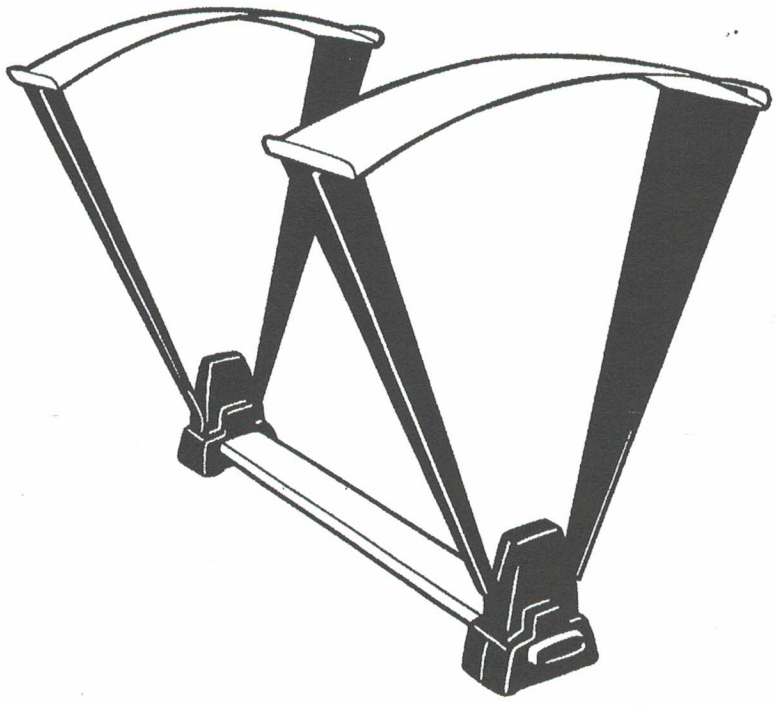
To begin with, please familiarize yourself with your Model 1 XP. You'll note the lack of an on\off switch. When **both** skyscreens are plugged into the skyscreen inputs on the back of the unit, marked ``Start" and ``Stop", the Model 1 XP will turn on. The red control buttons allow you to Edit and Review shots (more about those later) and are pressed together to clear the memory and begin a new string.

Your Model 1 XP uses a standard 9-volt alkaline battery. Battery life will vary with the quality of the battery (Duracell Alkaline seem to be the best) and the light level of the sky. The brighter the sky the more current the skyscreens will draw. As the battery runs down the sensitivity of the skyscreens will eventually begin to drop. Keep in mind that the computer in your Model 1 XP requires far less power to run than the skyscreen/detector system. On very cold days you might consider keeping an extra battery in warm your pocket and trading them out as the battery in your machine freezes. On the other hand, if it's that cold outside you might be better off staying home with your sweetheart and enjoying a hot buttered rum while you supervise her loading your ammo.

SKYSCREENS

Your Model 1 XP comes equipped with the finest Skyscreens on the market. The new PACT MKVI Professional Skyscreen contains two lenses that serve to magnify the bullet and bring it into sharp focus. This provides very accurate triggering. The black aiming guides hold the light diffuser. On blue-sky sunny days the white diffusers make it easier for the chronograph to see the bullet by providing a portable cloud for maximum contrast.

The extruded aluminum bracket is CNC machined to insure exact screen spacing. Just slide the Skyscreens on until they click into place. Fit the black sidepieces into the white crosspiece and slip the unit into the skyscreen. When you have done this to each skyscreen the completed package should look like this:

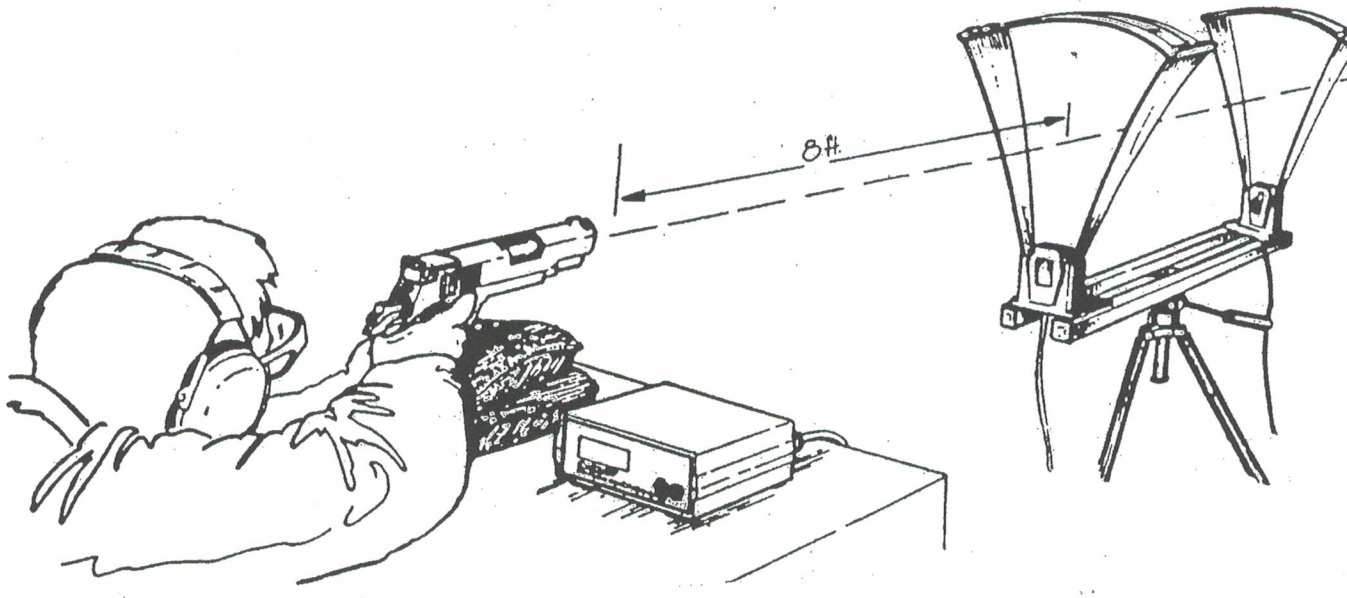


The first skyscreen the bullet will pass over should be plugged into START, the second screen should be plugged into STOP.

When you fire you should aim in such a way that the bullet passes through the triangle and over the center of both detector screens at 5 to 8 inches above them. Under most light conditions you can actually shoot higher than this and still get reading, but the accuracy may diminish slightly as you shoot higher. Under poor conditions, such as late afternoon or early morning in the winter or a very dark gloomy day, you may have to shoot lower in order to get readings.

Set your skyscreens up making sure that they and you are pointed in a safe direction. Place your Model 1 XP where you can read it at a glance, but make sure it is not in the side blast of the gun. Press the Review button and the Model 1 XP will say ``NONE" indicating that there is nothing in memory to review. Press Edit and the Model 1 XP will respond with ``NO" because there is nothing to edit yet. The display will now read: FIRE

LET'S CHRONOGRAPH SOME LOADS



MAKE SURE YOU HAVE YOUR SHOOTING GLASSES ON - IF YOU HIT A SKYSCREEN OR THE BRACKET HOLDING IT, BITS OF PLASTIC, METAL AND BULLET WILL FLY IN ALL DIRECTIONS.

Go ahead and fire a round through your Skyscreens. The Model 1 XP should display something like:

01 (the shot number), alternating with 2456 (the velocity in FPS)

If is does not, make sure that the first screen is plugged into START and the second screen is plugged into STOP. If this checked out you probably missed the "window," or – if you are shooting a very high blast gun, the side blast is locking the chronograph up. Try again; remember 5 to 8 inches over the detector and in the center of the screens.

Note that you must wait about 1 second between shots; we make you do this to allow the smoke to clear. If you fire too soon you will either get no reading, an error (ERR) warning or a very odd reading like 10 fps. Remember give it a second between shots.

Go ahead and fire a few more shots. Each time you fire, the current shot number and velocity will alternate on the display.

If you notice a bad reading, push the EDIT button. This will erase the last shot from the computers memory and back the display up to the previous shot. You can also use this feature after you have finished your string so don't feel like you have to fuss with your Model 1 XP in the middle of a string.

When you are done with your string, the Model 1 XP will provide you with a statistical summary. Each time you push the review key the Model 1 XP will move to the next item of the review. The display will alternate between the statistic shown, such as ``SD" for Standard Deviation, and the number. Here is an example of what you would see if you went through the entire review of a 5 shot string.

"HI" 2562 (the highest velocity of the string)

"LO" 2490 (the lowest velocity of the string)

"AV" 2520 (the average velocity of the string)

"ES" 72 (the extreme spread of the string)

"SD" 23 (the standard deviation of the string)

"AD" 21 (the average deviation or Mean Absolute Deviation of the string)

At this point each shot of the string (up to 20) can be individually reviewed. If you see a bad reading just push the edit button. After the last shot is reviewed push the review button again and you'll see that the statistics have been recalculated, without the shots you edited out. Two important points to remember when reviewing:

1. The chronograph will not record shots when it's in review mode.

2. To start a new string, exit review mode at any time by pressing the Review and Edit buttons together. The Model 1 XP will respond with ``FIRE" indicating that it has cleared its memory and is ready to begin a new string.

Each skyscreen contains a phototransistor, which is constantly measuring the current light level. Because of the contrast between the bullet and the sky, when a bullet goes over the skyscreen the light level changes a little bit. The amplifier inside your Model 1 XP takes note of this change in light level and amplifies it to the point that the change is big enough for the computer to notice. The computer then times how long it took for the bullet to travel from the first screen to the second screen where the light level again changes. Accurately converting this time into a velocity is easy, provided the computer knows how far apart the screens are. The skyscreen mounting bar takes care of that.

All light sensitive chronographs have a reputation for being flaky under certain light conditions. We have gone to great lengths to minimize this problem, but you may still occasionally run into a combination of conditions that may make it hard for your chrono to read correctly. It will help if you develop an understanding of how your chronograph works.

Your PACT Model 1 XP is looking for a change in light level when the bullet passes over the skyscreen. Assuming that enough light was entering the skyscreen to begin with, your Model 1 XP will always get an accurate reading. If, on the other hand, the light level or contrast is insufficient, you will probably get no reading at all.

By using the diffuser provided with your Model 1 XP you'll eliminate most of these troubles. The diffuser acts like a portable overcast day. Assuming the sun is hitting it, it will actually provide a "sky" that is 200% to 400% brighter than the blue sky above it, as well as enhancing the contrast.

If the sun is low in the sky and is illuminating the underside of the bullet your Model 1 XP may have a hard time seeing it even when using the diffuser screens. If this happens you might try shooting lower over the skyscreens. You may also eliminate the problem by changing the light conditions. You might also try changing the direction of fire and/or tilting your skyscreens. Remember we are trying to get as big a contrast between the bullet and the sky as possible.

When operating on an overcast day the diffusers will not do any thing for you (other than act as an aiming guide. If it's a very dark overcast day and you find your self having trouble getting reading try removing them altogether.

MUZZLE BLAST

Most of our original customers were pistol shooters and we have gone to some lengths to filter out muzzle blast. Unfortunately if we filter it out completely your chronograph would not see bullets either. When you fire a subsonic (below around 1200 FPS) round, the sound of the gun reaches the skyscreens before the bullet does. If it shakes the screens hard enough they will trigger and give you an incorrect reading. For example, let's say that you are firing a .45 ACP at 850 FPS and find that your Model 1 XP is telling you that your round is going 680 FPS. What's happening is that the muzzle blast is triggering the start screen before the bullet gets there, but it lacks sufficient power to trigger the stop screen by the time its traveled that far. So we have a situation where the blast started the computer and bullet stopped it, hence the low reading. If the blast is severe enough to trigger both screens, you will be measuring the speed of sound instead of your bullet velocity. In either case the solution is simple: BACK UP!

When you fire a supersonic round the bullet gets to the skyscreen before the blast does. Keep the muzzle a few feet back from the first skyscreen to keep from beating it up. Remember that the farther your screens are from the muzzle the lower the velocity your

chronograph will read (the bullet starts slowing down as soon as it leaves the barrel). If the blast is severe enough the gas from the cartridge (which proceeds the bullet for the first few feet of travel) may trigger the start screen and cause erroneous readings.

Another muzzle blast problem occurs when the skyscreens trigger on the shadow of the muzzle blast. This can happen when the sun is quartering to directly behind you and fairly low on the horizon (otherwise known as shooting north in the winter months). What happens is that you have a fairly dark blue sky, so the Glint Guard turns up its sensitivity. The sun is reflecting off the edge of the slit in your skyscreen. When you fire, your muzzle blast expands rapidly outward and as it crosses the line between the sun and your skyscreen the amount of light impacting the edge of the skyscreen slit drops producing an absurdly high reading (like 2700 FPS for your rimfire 22 pistol). Changing the direction of fire will solve the problem. If the fellow firing next to you causes your chronograph to trigger this is probably the culprit.

PROBLEMS

Hopefully you won't have any problems with PACT Model 1 XP. We have worked hard to make your Model 1 XP as reliable as possible. Of course every so often a capacitor dies, a resistor breaks or an integrated circuit heads south. Fortunately these things don't happen very often and we go to great lengths to see to it that we only use the best possible components. If your Model 1 XP does misbehave, here is some thing to check:

Are the screens plugged in correctly?

Is the battery up to speed? When it gets low on power your Model 1 XP will get less sensitive. For example it may have trouble seeing a .17 HMR although it may still pick up your .308.

Is the bullet in contrast with the sky? If it's not, the Model 1 XP will have a hard time seeing it.

Water can wreak havoc inside your skyscreens. If you leave them out in the rain they will fill with water, which will short out the phototransistor. If this happens, it may be necessary to take them apart to dry them out. You probably won't leave them out in the rain twice.

If you do have a problem, for goodness sake, DON'T SUFFER IN SILENCE! Call us – 800-722-8462. Our success depends on your satisfaction. We have been building electronic products for shooters for years. We will get you sorted out.

ODDS AND ENDS

How do you know if your Model 1 XP is telling you the truth? If the reading you get is close to what it should be you can count on it being within .5%. That's point five per cent not five percent. Normally you will find that the reading is actually better than that. If the unit prints a bad velocity it should be off by enough to be obviously wrong. Bright overcast days will produce more accurate and consistent readings than blue-sky sunny days.

In almost twenty years of chronograph building we have yet to have a unit returned for repair because it read too high. However about once a month a member of the Magnum/Weatherby club has us "check his unit out" because it reads "200 feet low." While we have seen a few bad counter chips, out of several thousands of chronographs tested, it is dam near impossible for a unit to read "200 feet low" with one cartridge and correct with another.

If you want to compare two chronographs you should set them up so that a single shot registers on both units. We recommend that you compare average velocities on 10 shot strings. To compare the "Variability" of one chronograph to another compare the SD's or MAD's (if available) recorded on each string on each chronograph. If chronograph "A" has a 10% lower SD or MAD on the same string as chronograph "B" than you can correctly say that chronograph "A" has a slightly lower "total system error."

Finally, as we have been saying for years, please:

DON"T BE A DUMB ASS
ALWAYS WEAR EYE PROTECTION!