

## LIMITED DISTRIBUTION

ILION RESEARCH DIVISION

## MONTHLY PROGRESS REPORT

NOVEMBER

1978

*File copy**Telexed & Mailed 11/24/78*MODEL 1100 WEIGHTED LT-20, 28 & 410 GA. SKEET SETS

Last month we reported that completed prototypes of weighted skeet guns duplicating weight and balance of both the large receiver 20 Gauge and the .410 Gauge gun had been sent to Marketing for their evaluation. During November there was no further activity on our part since we are awaiting Marketing decision on desired combinations.

XSG

The initial model of the XSG shotgun has been completed and function tested to 1340 rounds of 3 - 1 1/8 skeet loads, with one malfunction for a malfunction rate of less than .1%. A small crack started in the action bar in an area that had been modified several times to establish the proper carrier dog position. A new action bar will be ready to resume endurance testing in approximately two weeks. A second prototype including the floating piston system will also be available for initial tests at that time. The present integral action bar - piston assembly could prove to be troublesome in production, requiring expensive straightening and alignment operations. The floating piston should eliminate this potential problem. A third model with a stainless steel piston assembly will be available for testing late in February.

Wear characteristics of the new magazine cap detent system proved inadequate. New detent components with larger detenting surfaces are currently being built for further testing on current and new models of the XSG. This should not delay current tests.

*Copies to Supr.*

ILION RESEARCH DIVISION  
MONTHLY PROGRESS REPORT  
NOVEMBER 1978

-2-

MODEL 3200 SKEET SETS

Status of pilot tests are as follows:

Patterns - Pattern performance has not been consistent, or within specs, from gauge to gauge. Extremely tight patterns were typical of both the .410 Ga. and 28 Ga., below min patterns were the norm in the 20 Ga., and the 12 Ga. varied throughout the full spread of the specification. It must be remembered that the 3200 does not utilize the Remington Skeet Choke. While further investigation into choke configuration is recommended, bird breaking performance during shooting tests was good. This should not delay the project.

Indent - All gauges produced indents that were consistently below specs, with essentially the same distribution of values. Misfires were only experienced in the 12 Ga. and only to a minor degree. No changes are recommended at this time and no project delay should result.

Loading - Shell slips by ejector was encountered in all except the 12 Ga. It was present to a negligible degree in the 20 Ga. and to a more pronounced extent in the 28 Ga. and the .410 Ga. Barrels with min. chambers are being processed for test to see if this will reduce the extent of the problem. The problem is not considered serious enough to delay the project.

Endurance - One gun has completed 40,000 rounds (10,000 rds./ga.) with no serious problems.

ILION RESEARCH DIVISION  
MONTHLY PROGRESS REPORT  
NOVEMBER 1978

-3-

MODEL 3200 SKEET SETS Continued

Appearance - The overall appearance of the sets was judged acceptable with few minor problems that are easily corrected.

Summary - Preliminary discussions have been held with Marketing covering the above items. No cause for delay has been determined at this time. In depth review with Marketing will be conducted when the final test report is compiled.

MODELS 7400 - 7600

Fifteen (15) 7400 Rifles, including the carbines, have been tested for functional performance. Of the three calibers involved, the 30-06 and 243 Win. have been successfully debugged on limited testing. Additional rifles in these calibers will be tested to confirm this. It is anticipated that the .308 will respond to the corrections incorporated in the .243. That is, a longer barrel takedown nut that results in shorter required travel of the action.

The new magazines have not been function tested yet because no satisfactory followers have been received from the vendor. Vendor has been notified.

ILION RESEARCH DIVISION  
MONTHLY PROGRESS REPORT  
NOVEMBER 1978

-4-

NYLON 66 IMPROVEMENTS

Preliminary testing of the bolt handle lock open and the barrel mounted scope mount has been successfully completed. Final design testing of the bolt handle lock open should be started by the end of December.

All cost estimates received for previous design scope mounts have been high. Quotations have now been requested for a die cast and a thermoset mount of the same design. Work is also being done to design a one piece, stamped mount, which should be completed by the second week in December, with parts to follow.

MODEL 1100 - 870 IMPROVEMENTS

The 150 spring retained feed latches (split latches) are out of heat treat and in the assembly area. These will be assembled the last week of November.

The 150 carriers of thicker material have been installed, tested and shipped with excellent results. There were no carrier related malfunctions. This change in thickness will be reflected on our model drawings as soon as pertinent information is received from our vendor. This modification is aimed at reducing the number of stem carriers found in gallery testing.

Testing of the M/870 fore end tubes with 3 spot welds per bar proved to be unsatisfactory. However, the welds proved to be inferior and samples of new 3 and 4 spot welds per bar were made up with more heat and better weld area for test. This test will resume 12-11-78.

ILION RESEARCH DIVISION  
MONTHLY PROGRESS REPORT  
NOVEMBER 1978

-5-

MODEL 870 COMPETITION TRAP

An A and B Grade model will be ready for Marketing review by the middle of December. Machining of the vent rib and a stock are still required.

The target trigger has a binding problem in the disconnecter resulting in fail to connect malfunctions. Investigation of methods to assure the return of the disconnecter during the cocking operation is in progress.

MODEL 700 - 600 FIRE CONTROL

Basic layouts for a new fire control for these rifles are being made. Included in the design will be the blocking of the sear and trigger, with provision to open the bolt and unload the chamber with the safety in the ON SAFE position. Retrofittability to present rifles is an important consideration.

MODEL 6600

Because of personnel problems at the vendor's plant, prototype stocks will be delayed approximately 6 weeks. Assembly and initial tests should start by the second week in January.

MODEL 600 CARBINE

The cosmetic improvements are now being consolidated on 5 or 6 rifles for a January Marketing focus panel.

ILION RESEARCH DIVISION  
MONTHLY PROGRESS REPORT  
NOVEMBER 1978

-6-

MODEL 788

Cosmetics - A drawing has been started on the approved stock.

Information is still being generated by the computer room. Another stock is being built to be used to show cosmetic changes in the action.

22 Hornet - Drawings are in the Model Shop and parts should be ready by the middle of December.

MECHANICAL TRAP

The final draft of the manual has been approved. Manuals will be ready by the end of December.

BENCH REST BULLETS

6mm Bench Rest Bullet - 62,000 bullets were shipped to warehouse again this month.

Some minor problems were encountered with the blank and cup and cutoff operation, which resulted in increased downtime.

Reports are continually being received from shooters in various areas of the country that the Remington bench-rest bullets are not available in their localities.

Handgun Metallic Silhouette - Additional testing has been performed with the 7mm M.S. cartridge and the XP-100 chambered for it.

On November 18-19 the gun was fired in competition in Salem, N.H., resulting in a first place in the "Unlimited - Unclassified" category.

ILION RESEARCH DIVISION  
MONTHLY PROGRESS REPORT  
NOVEMBER 1978

-7-

PROCESS RESEARCHASEA Manipulator

Our unit is now operational and several programming tests have been run. Measurements were made on the force that the arm exerts in various positions. They were found stronger than the specifications indicated. From parameter data obtained in a visit to Norton's belt plant, the exerted forces appear quite adequate to polish receivers.

Sweden has modified their gripper somewhat and has requested that we try it out. It is rather flimsy and the tenon locator is still at an incorrect angle. They claim that this does not matter. We should receive both it, and the remaining fittings we need to operate it, shortly.

We are preparing a nest of (7) dial gages to test the systems repeatability on the outside of the machined receivers. A statistical analysis of the results will be compared to receiver measurements. It may be necessary to design a position correction system to realign the gripped receivers, so that their outside surfaces are at program zero, prior to polishing.

Polishing jacks have not been ordered. The latest quotes are still being reviewed with the vendors.

Since the manipulator appears stronger than anticipated, another loading test will be tried. Fingers will be fabricated for the standard gripper furnished with the machine. An attempt will be made to pick up centerfire barrel blanks on end, to simulate loading a machine such as the Ajax Upsetter.

ILION RESEARCH DIVISION  
MONTHLY PROGRESS REPORT  
NOVEMBER 1978

-8-

PROCESS RESEARCH Continued

Centerfire Rivetless Extractors

A complete review of the history of this item was made this month.

Currently we are fabricating at Ilion (10) of each size out of reworked regular blanks. These will incorporate smaller radius detents for snappier action. They will be tested in M/7400 and M/700 actions under extremely adverse conditions - cold, humid and dirty.

Regular in 270	& 30-06
Magnum in 300 Win. Mag.	& 7mm Mag.
Small in 222	& 223

The proposed new regular design incorporates a thicker cross section behind the claw. Since we cannot make this here, we have ordered (1000) to be made on temporary tooling by H & P. Their final piece price by their process is \$.1295 each for all sizes, which results in the following approximate cost savings, based on the 1979 forecast for all centerfire rifles.

\$ 89,000	Purchased Part Savings
\$ 80,000	Reduction in Assembly Costs
\$ 169,000	Total Gross Savings

It is expected that we will phase in the rivetless extractor into the existing bolt action centerfire rifles in 1980, but not in the M/742 or M/760.

It is also expected that it will be incorporated in the M/7400 - 7600 introduction.



ILION RESEARCH DIVISION  
MONTHLY PROGRESS REPORT  
NOVEMBER 1978

-9-

PROCESS RESEARCH ContinuedAuto-Drill Line

As the initial vendor floor plans proved inadequate, a new layout was prepared at Ilion, using prior detail data, plus a review of the assembly drawings sent in for approval. This layout now incorporates official centerline distances between the various units. The layout was validated by a thorough check of the detail drawings at Albion on November 1st. Some corrections to their drawings were found necessary to conform to the established centerlines, and to properly handle tool changes. They still lack a committed design for the conveying system between the saw and the gantry drill loader. The machine bases are nearly complete and will be laid on the line keel early in December. It is possible that the June scheduled completion will be beaten.

On November 2nd there was a meeting at Albion with the selected chip system people. The Ilion layout incorporated their equipment plus a Hoffman Vacu-matic rough filter system. A courtesy representative from Hoffman was also present and the entire system reviewed and finalized. A final quote is due shortly. It appears that the installation excavation can be scheduled for April 1979. The chip system vendor will furnish construction drawings.

Two oil/chip separation systems were also visited, with the last one incorporating automatic solids separation just prior to the wringer. This will remove any sawed bar wafers or small tools that inadvertently find their way into the system. Coarse screens under the machines will keep out larger parts such as barrel blanks.

ILION RESEARCH DIVISION  
MONTHLY PROGRESS REPORT  
NOVEMBER 1978

-10-

PROCESS RESEARCH Continued

Auto-Drill Line Continued

In early December Sandvik will be visited to review their life tests on ejector drills. They have 600 of our blanks and these will be made into usable 870-12-30 parts. In early tests they ran at 16" per minute penetration rate with this type of tool and this is the basis for potential increased production on this line. The Albion Drills are being constructed to accept either conventional or ejector drill systems.

The saw vendor will also be visited on this trip to review the inclusion of their controls into the overall automation.

M/1100 Formed Ejector

Prototype formed ejectors for 12 Ga. 2-3/4" shells were made up in various positions along the barrel extensions. Testing of other gauges and shell lengths is continuing. A phase in during the last part of 1979 appears realistic. An initial estimate indicates \$57,000 per year gross savings.

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