M/700 416 CAL STrength 893111

1989

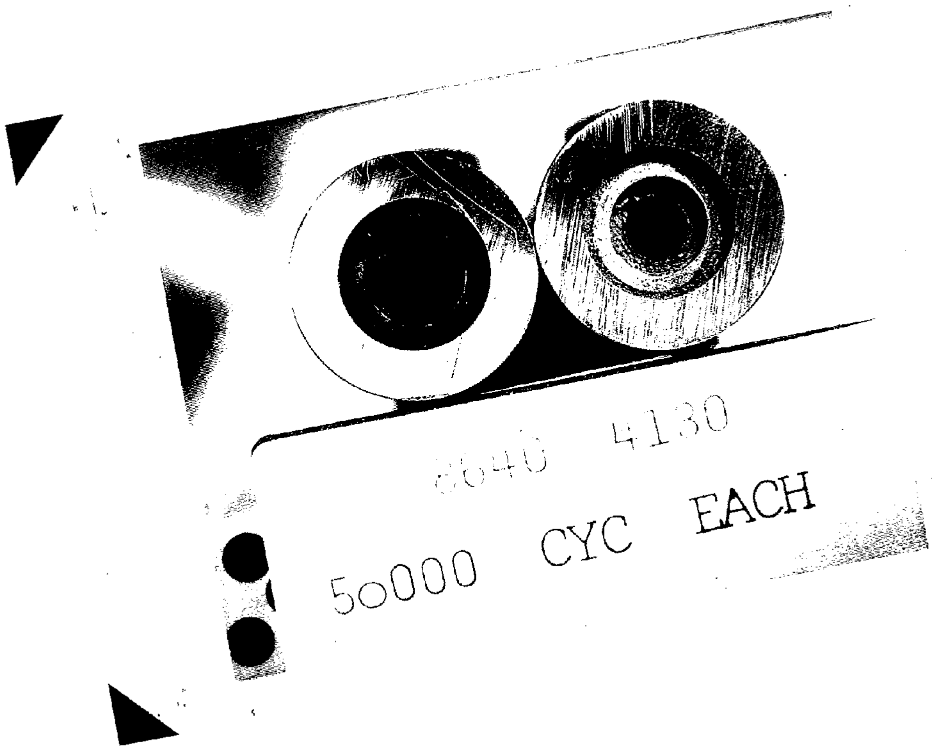
890891 Fj Pin Stop Washer (Dry Cycle)

892832 .17CAL Endurance

890411 Sniper/Sporter

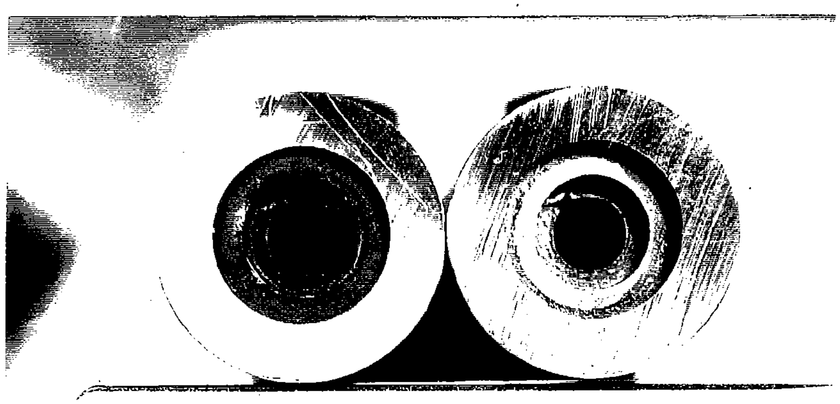
890531 Arylon field Function

890412 Sight Mod.


8640 4130
50000 CYC EACH

Polaroid

#84112104 6318



2640 4130

50000 CYC EACH

Polaroid

#84112A04631B

Report No. 890891

RESEARCH TEST & MEASUREMENT LAB WORK REQUEST

___ Developmental
X Design Acceptance
___ Pre-Pilot
___ Pilot
___ Production Acceptance

AREA OF TESTING

___ Safety Related
___ Competitive Evaluation
___ New Design
X Design Change
___ Plant Assistance

___ Litigation
___ Warehouse Audit
___ Cost Reduction
Stake ___
___ Other

FIREARM STAT'S.

MODEL: M 700
CAL. or GAGE: ___
BARREL TYPE: ___
PROOFED: YES ___ NO ___

REPORT REQ'D.

FORMAL ~~X~~
* TEST RESULTS ONLY X

Ed Owens 443
DATE REQUESTED: 3-30-89
DATE NEEDED BY: ASAP
REQUESTED BY: Fred Martin
WORK ORDER NO: 481153

TEST TYPE

___ Strength Test
___ Function Test
___ Accuracy Test
___ Ammunition Test
___ Environmental Test
___ Customer Complaint
X Dry Cycle Test
___ Measurements
X Endurance Test
___ Photo/Video
___ Other ___

EXPLAIN IN DETAIL THE REASON FOR THIS TEST: – To Evacuate A Vendor Suggested Mat'l Change In The Ejector Pin Stop Washer – The Mat'l Was 8640 ~~[illegible]~~ Present And The Vendor Would Like To Change To 4130 Proposed Mat. Dry Cycle Bolts Supplied 10 Present Production 10 Proposed Mat'l. Change 25,000 Cycles JRS Section And Inspect For Wear And Or Impact Deformation
(*Note: 1 of each sample to 50,000 cyc)

GUNS REQUIRED:

NOTE: NO firearms or parts will be tested in the Labs unless they are accompanied by a Work Request, and both are delivered to the Labs by the designer or engineer. All Work Requests are to be filled out in detail. No Exceptions.

DATE COMPLETED: 5-5-89
TEST COMPLETED BY: RWH
REPORT DATE: ___

FRI 5 MAY 89

REASON FOR TEST

TO EVALUATE A SUGGESTED MATERIAL CHANGE IN THE EJECTOR STOP WASHER IN THE M/700 BOLT FROM THE CURRENT 8640 TO THE PROPOSED 4130

EQUIPMENT REQUIRED:

M/700 DRY CYCLE MACHINE, TEST LAB PERSONNEL, TEN ~~EACH OF THE TWO TYPES~~ M/700 BOLTS ~~EQUIPPED WITH THE~~

TEST PROCEDURE!

A. EACH INDIVIDUAL BOLT WAS PLACED IN A M/700 TEST LAB ACTION ~~AND~~ IN THE BOLT ACTION COCK AND FIRE DRY CYCLE MACHINE AND CYCLED TO THE FOLLOWING. NINE OF EACH TYPE TO AT LEAST 25,000 CYCLES EACH AND ONE OF EACH TYPE TO A TOTAL OF 50,000 CYCLES,

B. AFTER DRY CYCLE EACH BOLT, WAS CUT OFF APROX 1 3/8" FROM ~~[illegible]~~ THE LOCKING LUG END SO THE RETAINER WASHERS COULD BE VISUALY EVALUATED FOR WEAR AND OR DEFORMATION,

TEST RESULTS,

ALL 20 SAMPLES REGUARDLESS OF DRY CYCLE LEVEL SHOWED ONLY SLIGHT ~~NO REAL~~ VISUAL DIFFERANCE WITH NO APPARENT WEAR OR DEFORMATION,

SEE PICTURES OF TWO 50,000 CYC LEVEL SAMPLES ATTACHED.

TEST AND MEASUREMENT LAB - TEST REPORT

REQUESTER: K. Green WRITTEN BY: D.Thomas DATE: Nov. 2, 1989
REPORT NO: 892832 WORK ORDER: 481152
TEST TYPE: Endurance / Strength

REASON FOR TEST:
To determine the endurance life and the ultimate strength of the 17 caliber barrels made to the upset barrel process.

EQUIPMENT REQUIRED:
8 Model 700, 17 cal. upset barrel process & 1 Model 700, 22/250

Cal.	Serial#	Comment
17	A6863413	Stress Relieved, used in destructive test
17	A6864021	Not Stress Relieved, used in destructive test
17	A6861310	Stress Relieved, endurance gun
17	A6862427	Stress Relieved, endurance gun
17	A6864953	Stress Relieved, endurance gun
17	B6257036	Not Stress Relieved, endurance gun
17	A6862992	Not Stress Relieved, endurance gun
17	A6861855	Not Stress Relieved, endurance gun

1988 C6357962 22/250

48000 rounds Remington 17 cal ammo
3000 rounds Remington 22-250 ammo
1000 rounds Federal 22-250 ammo
Iron Lung
Reloading Equipment
Shooting Room 52-1-A
Protective Shield & lanyard

TEST PROCEDURE:

STRENGTH:
Two Barrels, one stress relieved and one non-stress relieved, were used in the destructive test.
The bore was plugged with four 25 gn. bullets ahead of the chamber.
Each gun, in turn, was fixtured in the iron lung and had a destructive load shot through the it. The guns were fired remotely by means of a lanyard.
The following destructive load was fired in each gun:

25 gn. 296 powder
25 gn Remington bullet
Remington case
Remington primer

Estimated pressure 150000 psi +

TEST PROCEDURE: (cont.)

ENDURANCE:
Each gun was endurance tested using the following procedure:

A lanyard was attached to the gun so that the gun could be fired from behind a screen.
A cartridge was loaded in the chamber (The magazine was NOT loaded)
The tester would walk behind the screen and fire the gun.
The gun was fired twenty times using this procedure and then cooled.
Every 100 rounds the bore was cleaned.

TEST RESULTS:

STRENGTH:
Neither the stress relieved nor the non-stress relieved barrel failed during the ultimate strength test.

ENDURANCE:
All of the bores showed severe heat checking ahead of the chamber after 500 rounds. Endurance shooting continued until each gun had 8000 rounds shot through it. There were no failures in neither the stress relieved nor the non-stress relieved barrels.
One Model 700, 22-250 caliber, serial # C6357962, was endurance tested 4000 rounds during a previous 17 caliber test (891701). This 22-250 was continued to 8000 rounds with no barrel failure.

Report No. 890411

RESEARCH TEST & MEASUREMENT LAB WORK REQUEST

X Developmental
____ Design Acceptance
____ Pre-Pilot
____ Pilot
____ Production Acceptance

AREA OF TESTING

____ Safety Related ____ Litigation
____ Competitive Evaluation ____ Warehouse Audit
X New Design ____ Cost Reduction
____ Design Change Stake ____
____ Plant Assistance ____ Other

FIREARM STAT'S.

MODEL: M700 ALTERED
CAL. or GAGE: 308/300 / .243
BARREL TYPE: SNIPER/SPORTER
PROOFED: YES ____ NO X

REPORT REQ'D.

FORMAL X
TEST RESULTS ONLY ____

DATE REQUESTED: 2-9-'89
DATE NEEDED BY: ____
REQUESTED BY: E. MARTIN
WORK ORDER NO: ____

TEST TYPE

____ Strength Test ____ Ammunition Test ____ Dry Cycle Test ____ Photo/Video
____ Function Test ____ Environmental Test ____ Measurements ____ Other ____
____ Accuracy Test ____ Customer Complaint ____ Endurance Test ____

EXPLAIN IN DETAIL THE REASON FOR THIS TEST: SHOOT 2 SAMPLES FOR ACCURACY AND REPEATABILITY:
VERSION #1 SNIPER VARIANT HAS 2 BARRELS, PROOF EACH AND SHOOT FOR ACCURACY 5-5/200YDS. FOR FINAL GROUP EACH ~~BARREL~~ CALIBER DISMOUNT BARREL, REMOUNT, AND SHOOT LAST GROUP TO CHECK FOR IMPACT SHIFT.
VERSION #2 SPORTER VARIANT HAS 1 BARREL PROOF AND PROCEED AS ABOVE EXCEPT SHOOT 100YDS.

GUNS REQUIRED: TO BE SUPPLIED/TO BE SHOT FROM SHOULDER - JERRY

NOTE: NO firearms or parts will be tested in the Labs unless they are accompanied by a Work Request, and both are delivered to the Labs by the designer or engineer. All Work Requests are to be filled out in detail. No Exceptions.

DATE COMPLETED: 3-27-89
TEST COMPLETED BY: J. SELAN
REPORT DATE: 3-27-89

TEST AND MEASUREMENT LAB TEST RESULTS

REQUESTER: F.E. MARTIN   TESTER: J. SELAN   DATE: 3/27/89
REPORT NO.: 890411   WORK ORDER NO.: 481009
WRITTEN BY: J. SELAN
TEST TYPE: DEVELOPMENTAL

FIREARM STAT'S : MODEL: M-700 ALTERED   CAL or GAUGE: 300W.M.-308-243
BARREL TYPE: SNIPER/SPORTER   PROOFED: YES ✓ NO ___

REASON FOR TEST :

ACCURACY IN THE M-700 ALTERED VERSION IN 243 SPORTER, .308 & .300 WIN. MAG. SNIPER. AND TO CHECK FOR POI. SHIFT.

EQUIPMENT REQUIRED :

100 & 200 YD. RANGE.
2 ALTERED RIFLES. (243 WIN. SER.# C6229208) 308-300 WIN. MAG SER.# C6247270
REM: AMMO: 300 W. MAG. 180 GR. PSP "CORE-LOKT" R-300W2 LOT#. 5170C6823
.308 WIN. MATCH-168 GR. BT. HP. R-308W7 LOT "1"
243 WIN. 80 GR. "POWER-LOKT" H.P. R.243W1 K10MD2622.
20X LYMAN ALL AMERICAN SCOPE. / MISC. CLEANING EQUIPMENT.
DIGITIZING TABLET. H.P. 9000 COMPUTER. CAL COMP. 9000

TEST PROCEDURE :

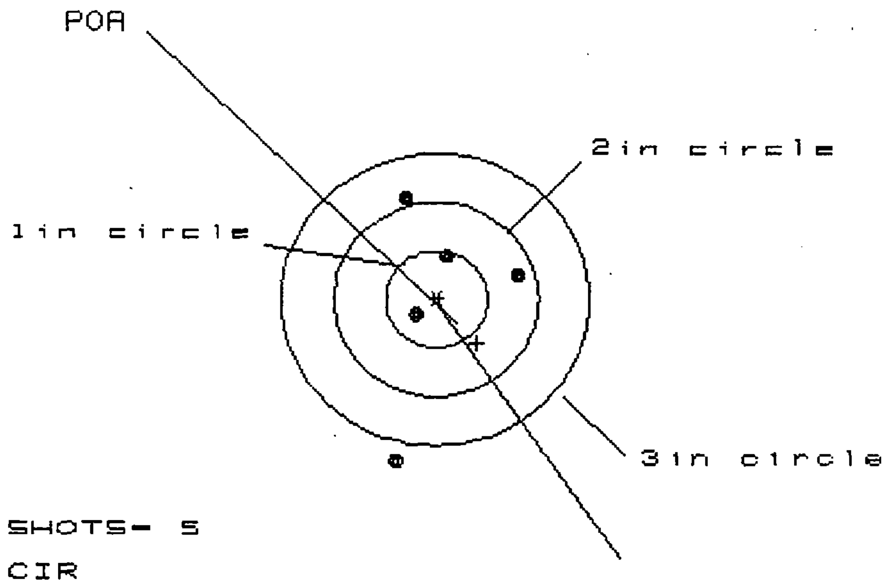
- PROOF ALL VERSIONS.
- SHOOT 5-5 SHOT GROUPS, 100 YDS. - REMOVE BBL. AND REPLACE SHOOT LAST GROUP FOR POI. SHIFT
- SHOOT .308 & 300 W. MAG. AT 200 YDS. (5-5 SHOT GROUPS) - AGAIN REMOVE BBL. ON BOTH VERSIONS AND SHOOT LAST GROUP FOR POI. - SHIFT.
- SHOOT ALL VERSIONS FROM SHOULDER.

TEST RESULTS :

- ORIGINAL BOLTS ON .243 AND .308 WIN. - BOLT SHROUDS BLEW AT PROOF REPLACED AND REPROOFED - OK.
- .243 BBL. REMOVED VERY HARD AFTER SHOOTING FOUR GROUPS.
- AFTER BBLS. REMOVED - ALL VERSIONS SHOWED AN IMPACT SHIFT AND HORIZONTAL SPREAD.
- TARGETS INCLUDED ON FOLLOWING SHEETS.

27 Mar 1989 FILE:/PATTERNING/CENTERFIRE_PATT/B90411.1.1

CENTERFIRE PATTERNS # 1



CENTROID *

# OF SHOTS= 5
# IN CIR
1in = 2
2in = 3
3in = 4
HS= 1.177
VS= 2.720
GS= 2.723

AVG G.S = 3.18 AVG. M.R= 1.249

PATTERN # : 1

.300 WIN. MAG. VARIENT.

SHOTS (BEST OF)	:	5	4	3
MAXIMUM X	:	.788	.691	.568
MINIMUM X	:	-.389	-.369	-.412
MAXIMUM Y	:	1.090	.683	.269
MINIMUM Y	:	-1.630	-.567	-.339
CENTROID X	:	-.400	-.303	-.180
CENTROID Y	:	.454	.861	.633
POA TO CENTROID in.	:	.605	.913	.658
MIN RADIUS	:	.250	.052	.310
MEAN RADIUS	:	.866	.543	.472
MAX RADIUS	:	1.675	.776	.572
HORIZONTAL SPREAD	:	1.177	1.060	.980
VERTICAL SPREAD	:	2.720	1.250	.608
EXTREME SPREAD	:	2.723	1.352	1.062

NUMBER IN ONE INCH CIRCLE = 2
NUMBER IN TWO INCH CIRCLE = 3
NUMBER IN THREE INCH CIRCLE = 4

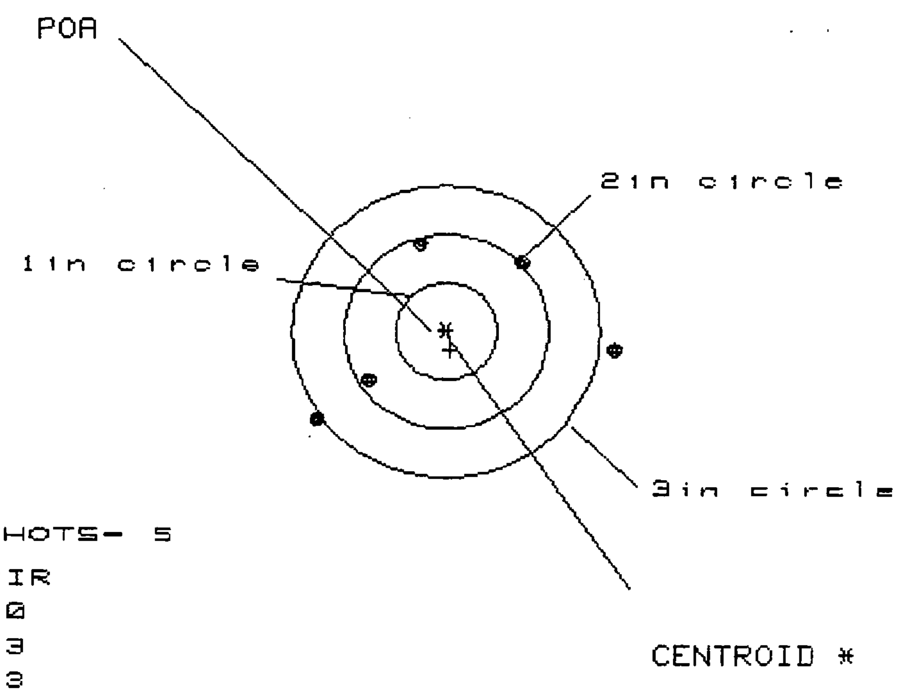
Ammo:
180 GR. P.S.P. "CORE-LOKT"
R.300W2
LOT. E170C 6823

SCOPE:
LYMAN ALL. AMERICAN
20X

BENCH REST. 200 YDS.

27 Mar 1989 FILE:/PATTERNING/CENTERFIRE_PATT/B904[1.1.1

CENTERFIRE PATTERNS # 2



OF SHOTS= 5

# IN CIR
1in = 0
2in = 3
3in = 3

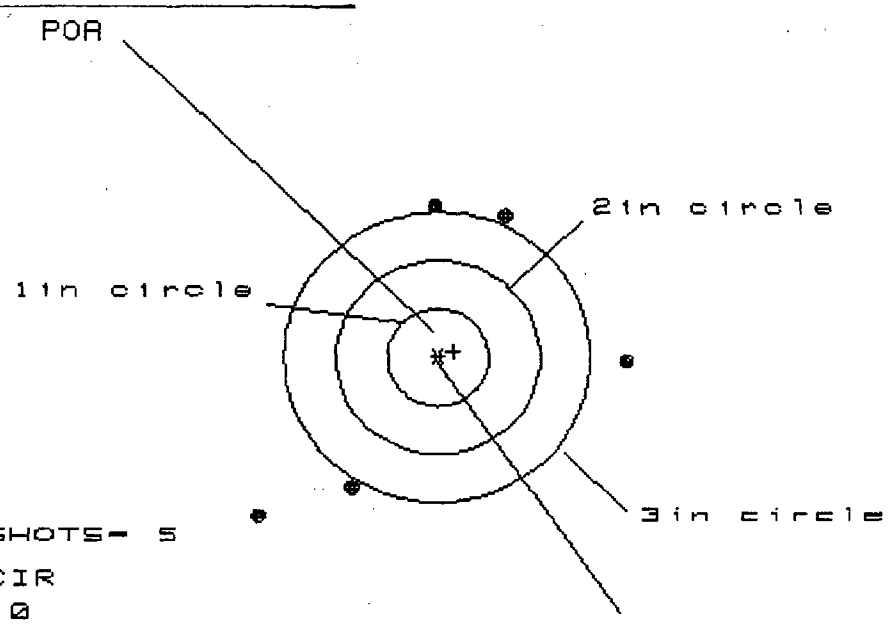
HS= 2.928
VS= 1.793
GS= 3.002

PATTERN #	:	2		
SHOTS (BEST OF)	:	5	4	3
MAXIMUM X	:	1.635	1.126	.831
MINIMUM X	:	-1.293	-.885	-.679
MAXIMUM Y	:	.916	.863	.553
MINIMUM Y	:	-.877	-.930	-.850
CENTROID X	:	-.042	-.450	-.155
CENTROID Y	:	.193	.246	.556
POA TO CENTROID in.	:	.197	.513	.577
MIN RADIUS	:	.930	.662	.574
MEAN RADIUS	:	1.214	1.025	.848
MAX RADIUS	:	1.648	1.283	1.087
HORIZONTAL SPREAD	:	2.928	2.011	1.510
VERTICAL SPREAD	:	1.793	1.793	1.403
EXTREME SPREAD	:	3.002	2.530	1.896

NUMBER IN ONE INCH CIRCLE = 0
NUMBER IN TWO INCH CIRCLE = 3
NUMBER IN THREE INCH CIRCLE = 3

27 Mar 1989 FILE:/PATTERNING/CENTERFIRE_PATT/B98411.1.1

CENTERFIRE PATTERNS # 3



\# OF SHOTS= 5

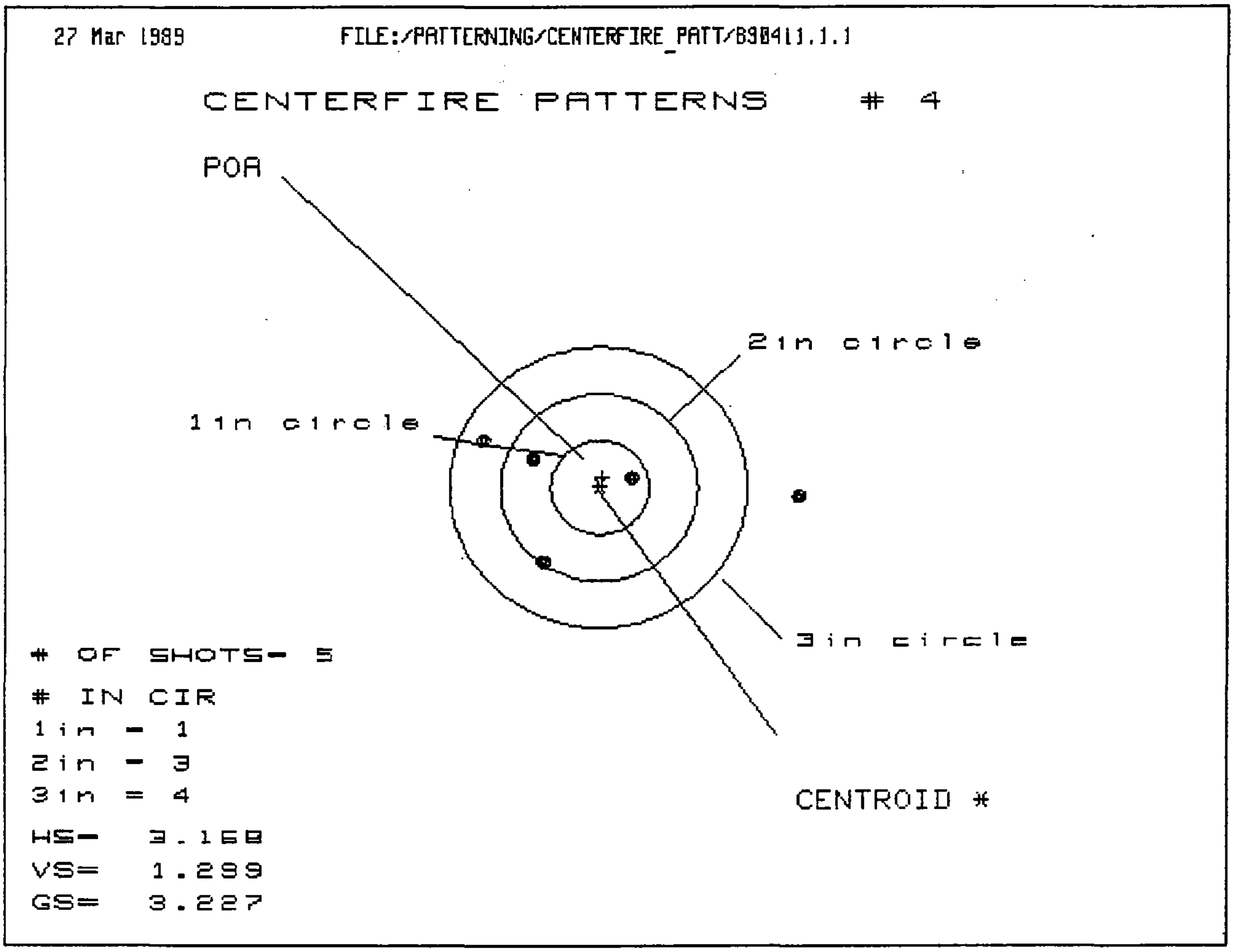
\# IN CIR
1in = 0
2in = 0
3in = 0

HS= 3.622
VS= 3.220
GS= 3.946

PATTERN # : 3

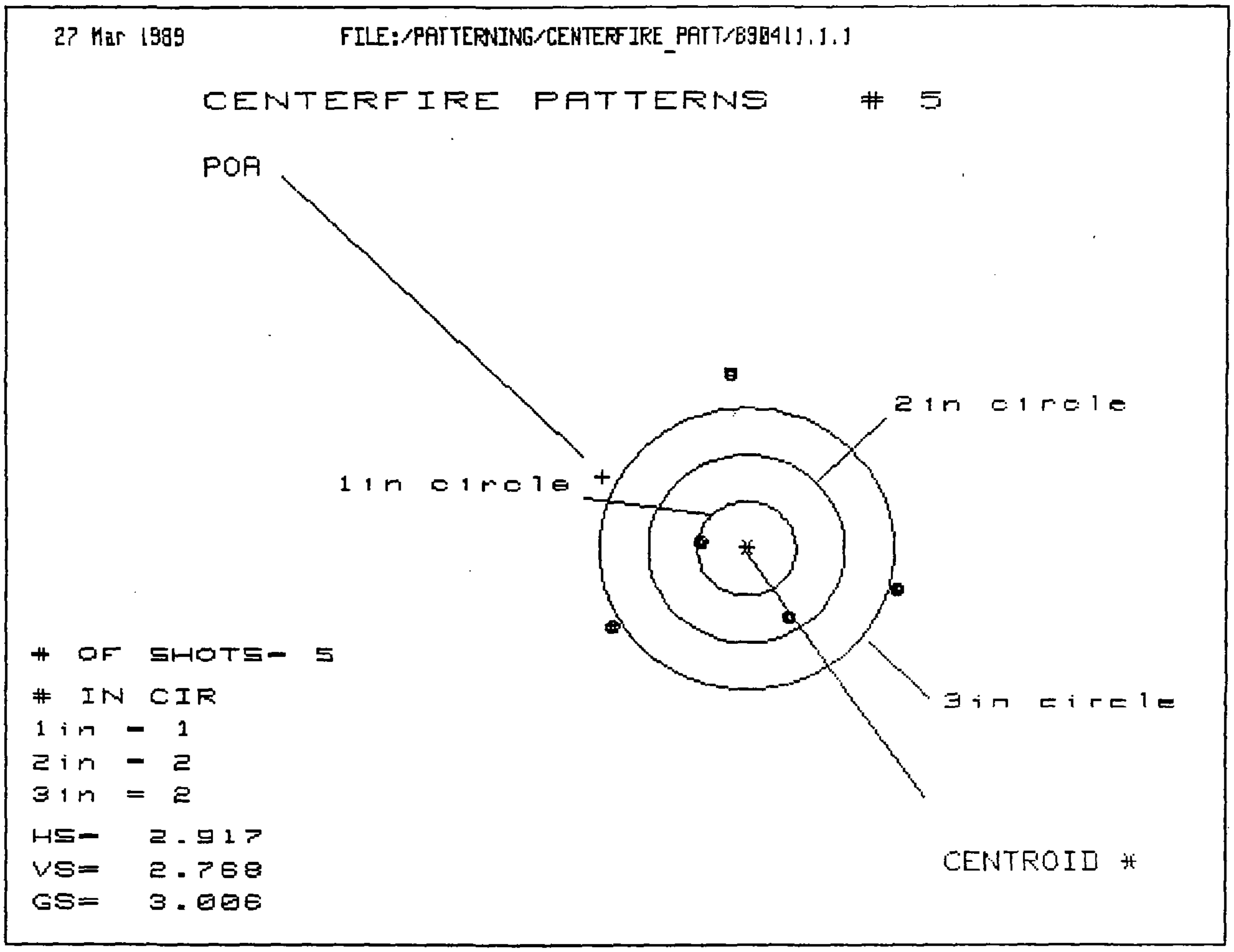
SHOTS (BEST OF)	:	5	4	3
MAXIMUM X	:	1.902	1.472	.762
MINIMUM X	:	-1.720	-1.284	-.794
MAXIMUM Y	:	1.599	1.194	1.041
MINIMUM Y	:	-1.621	-1.759	-1.912
CENTROID X	:	-.154	.276	-.215
CENTROID Y	:	-.061	.344	.497
POA TO CENTROID in.	:	.166	.441	.542
MIN RADIUS	:	1.593	1.060	1.041
MEAN RADIUS	:	1.812	1.515	1.423
MAX RADIUS	:	2.363	2.178	2.070
HORIZONTAL SPREAD	:	3.622	2.757	1.556
VERTICAL SPREAD	:	3.220	2.953	2.953
EXTREME SPREAD	:	3.946	3.189	3.189

NUMBER IN ONE INCH CIRCLE = 0
NUMBER IN TWO INCH CIRCLE = 0
NUMBER IN THREE INCH CIRCLE = 0



PATTERN #	:	4		
SHOTS (BEST OF)	:	5	4	3
MAXIMUM X	:	2.016	.822	.606
MINIMUM X	:	-1.152	-.648	-.344
MAXIMUM Y	:	.486	.454	.442
MINIMUM Y	:	-.813	-.845	-.694
CENTROID X	:	-.027	-.531	-.315
CENTROID Y	:	-.109	-.077	-.228
POA TO CENTROID in.	:	.112	.536	.389
MIN RADIUS	:	.344	.318	.561
MEAN RADIUS	:	1.061	.696	.653
MAX RADIUS	:	2.020	.846	.741
HORIZONTAL SPREAD	:	3.168	1.470	.950
VERTICAL SPREAD	:	1.299	1.299	1.136
EXTREME SPREAD	:	3.227	1.512	1.282

NUMBER IN ONE INCH CIRCLE = 1
NUMBER IN TWO INCH CIRCLE = 3
NUMBER IN THREE INCH CIRCLE = 4



PATTERN # : 5

SHOTS (BEST OF)	:	5	4	3
MAXIMUM X	:	1.560	1.514	.926
MINIMUM X	:	-1.357	-1.403	-.898
MAXIMUM Y	:	1.898	.569	.585
MINIMUM Y	:	-.870	-.395	-.379
CENTROID X	:	1.468	1.514	1.009
CENTROID Y	:	-.771	-1.246	-1.262
POA TO CENTROID in.	:	1.658	1.960	1.616
MIN RADIUS	:	.496	.477	.586
MEAN RADIUS	:	1.294	1.057	.836
MAX RADIUS	:	1.907	1.515	.975
HORIZONTAL SPREAD	:	2.917	2.917	1.824
VERTICAL SPREAD	:	2.768	.964	.964
EXTREME SPREAD	:	3.006	2.951	1.832

NUMBER IN ONE INCH CIRCLE = 1
NUMBER IN TWO INCH CIRCLE = 2
NUMBER IN THREE INCH CIRCLE = 2

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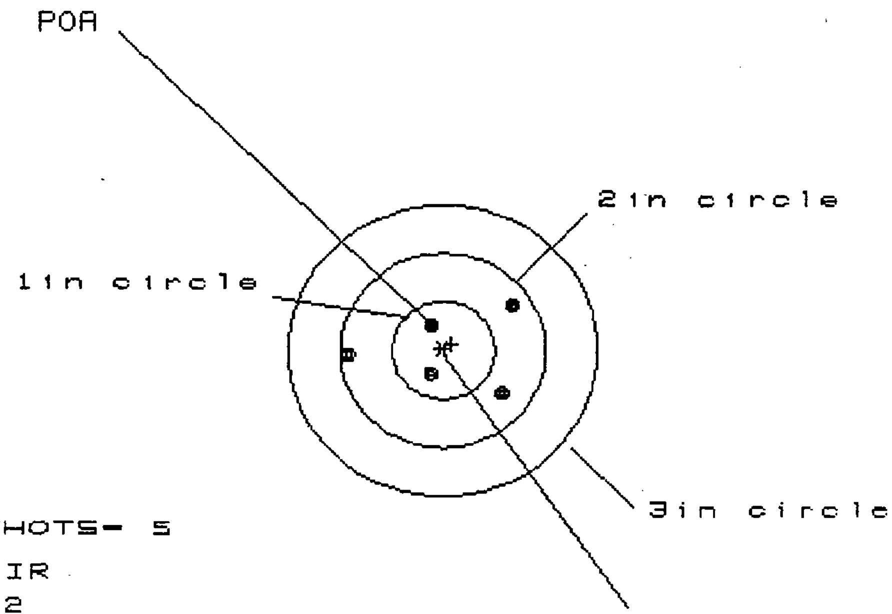
CENTERFIRE PATTERNS # 1



CENTROID *

\# OF SHOTS= 5

\# IN CIR
1in = 2
2in = 5
3in = 5

HS= 1.684
VS= .872
GS= 1.739

AVG. G.S. = 1.96 AVG.: M.R. = .6794

.368 WIN. SNIPER VARIENT.

PATTERN #	:	1		
SHOTS (BEST OF)	:	5	4	3
MAXIMUM X	:	.721	.481	.458
MINIMUM X	:	-.963	-.406	-.246
MAXIMUM Y	:	.429	.427	.358
MINIMUM Y	:	-.443	-.445	-.302
CENTROID X	:	-.076	.164	.004
CENTROID Y	:	-.066	-.065	-.207
POA TO CENTROID in.	:	.101	.176	.207
MIN RADIUS	:	.237	.422	.219
MEAN RADIUS	:	.602	.515	.401
MAX RADIUS	:	.963	.643	.549
HORIZONTAL SPREAD	:	1.684	.887	.704
VERTICAL SPREAD	:	.872	.872	.660
EXTREME SPREAD	:	1.739	1.058	.965
NUMBER IN ONE INCH CIRCLE	=		2	
NUMBER IN TWO INCH CIRCLE	=		5	
NUMBER IN THREE INCH CIRCLE	=		5	

Ammo:
MATCH. 168GR. BT. H.P.
R 308W7
LOT. "L"

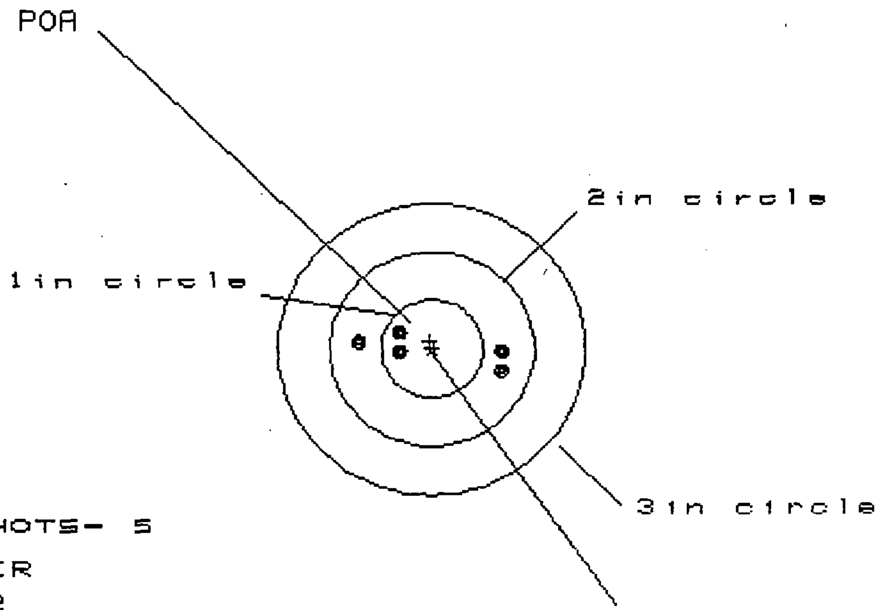
SCOPE.
LYMAN. ALL AMERICAN
20X.

BENCH REST - 200 YDS.

CONFIDENTIAL-SUBJECT TO PROTECTIVE ORDER
KINZER V. REMINGTON

27 Mar 1989 FILE:/PATTERNING/CENTERFIRE_PATT/B90411.1

CENTERFIRE PATTERNS # 2



CENTROID *

OF SHOTS- 5

IN CIR
1in - 2
2in - 5
3in = 5

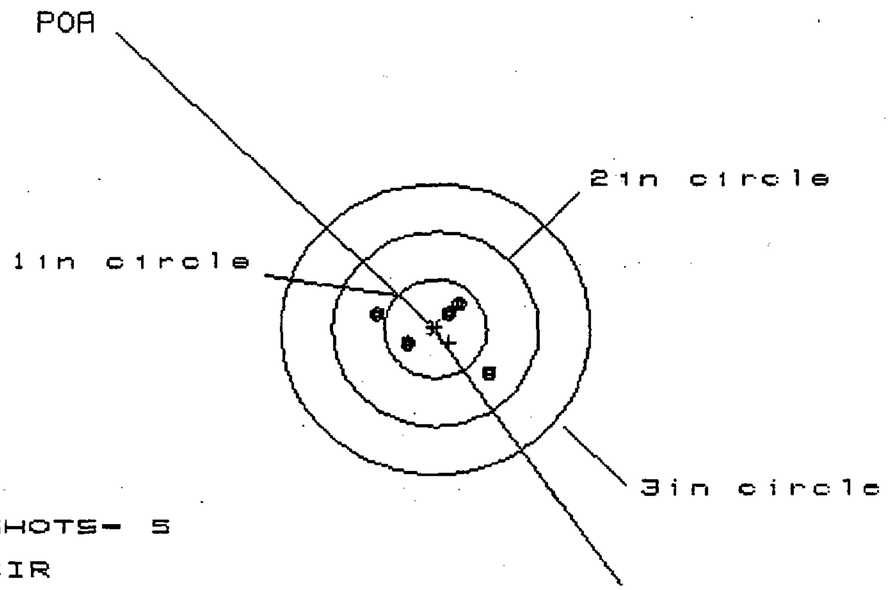
HS= 1.397
VS= .370
GS= 1.403

PATTERN #	:	2		
SHOTS (BEST OF)	:	5	4	3
MAXIMUM X	:	.701	.527	.665
MINIMUM X	:	-.696	-.540	-.365
MAXIMUM Y	:	.147	.171	.168
MINIMUM Y	:	-.223	-.199	-.202
CENTROID X	:	.020	.194	.018
CENTROID Y	:	-.071	-.095	-.092
POA TO CENTROID in.	:	.073	.216	.094
MIN RADIUS	:	.336	.506	.345
MEAN RADIUS	:	.562	.526	.469
MAX RADIUS	:	.702	.542	.695
HORIZONTAL SPREAD	:	1.397	1.068	1.030
VERTICAL SPREAD	:	.370	.370	.370
EXTREME SPREAD	:	1.403	1.069	1.056

NUMBER IN ONE INCH CIRCLE = 2
NUMBER IN TWO INCH CIRCLE = 5
NUMBER IN THREE INCH CIRCLE = 5

27 Mar 1989 FILE:/PATTERNING/CENTERFIRE_PATT/B904[1.]

CENTERFIRE PATTERNS # 3



OF SHOTS= 5

# IN CIR
1in = 3
2in = 5
3in = 5

CENTROID *

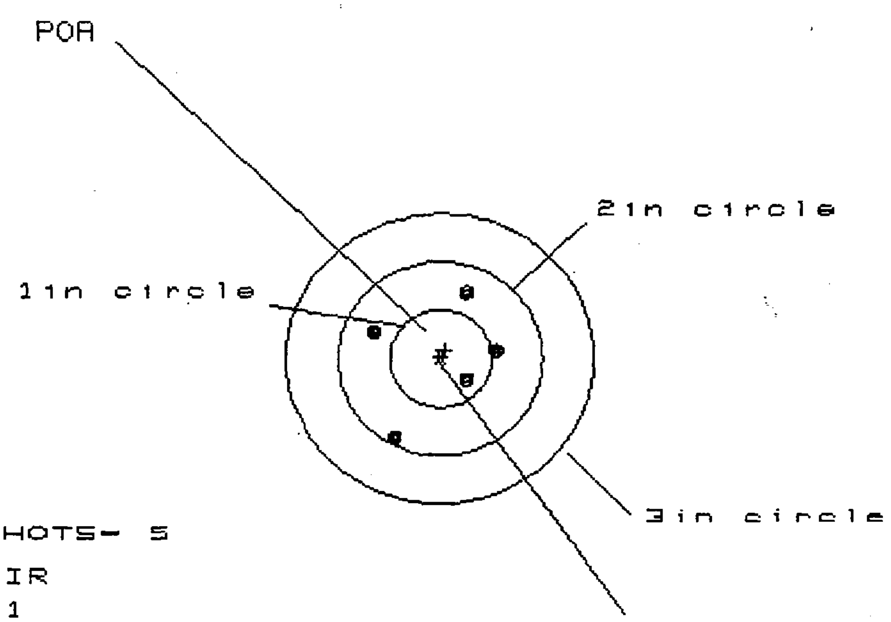
HS= 1.105
VS= .774
GS= 1.270

PATTERN #	:	3		
SHOTS (BEST OF)	:	5	4	3
MAXIMUM X	:	.565	.319	.186
MINIMUM X	:	-.540	-.398	-.289
MAXIMUM Y	:	.305	.188	.201
MINIMUM Y	:	-.469	-.275	-.262
CENTROID X	:	-.123	-.265	-.132
CENTROID Y	:	.141	.258	.245
POA TO CENTROID in.	:	.187	.370	.279
MIN RADIUS	:	.191	.241	.120
MEAN RADIUS	:	.435	.332	.261
MAX RADIUS	:	.735	.400	.390
HORIZONTAL SPREAD	:	1.105	.717	.475
VERTICAL SPREAD	:	.774	.463	.463
EXTREME SPREAD	:	1.270	.732	.663

NUMBER IN ONE INCH CIRCLE = 3
NUMBER IN TWO INCH CIRCLE = 5
NUMBER IN THREE INCH CIRCLE = 5

27 Mar 1989 FILE:/PATTERNING/CENTERFIRE_PATT/B90411.1

CENTERFIRE PATTERNS # 4



OF SHOTS= 5

IN CIR

1in = 1

2in = 5

3in = 5

HS= 1.171

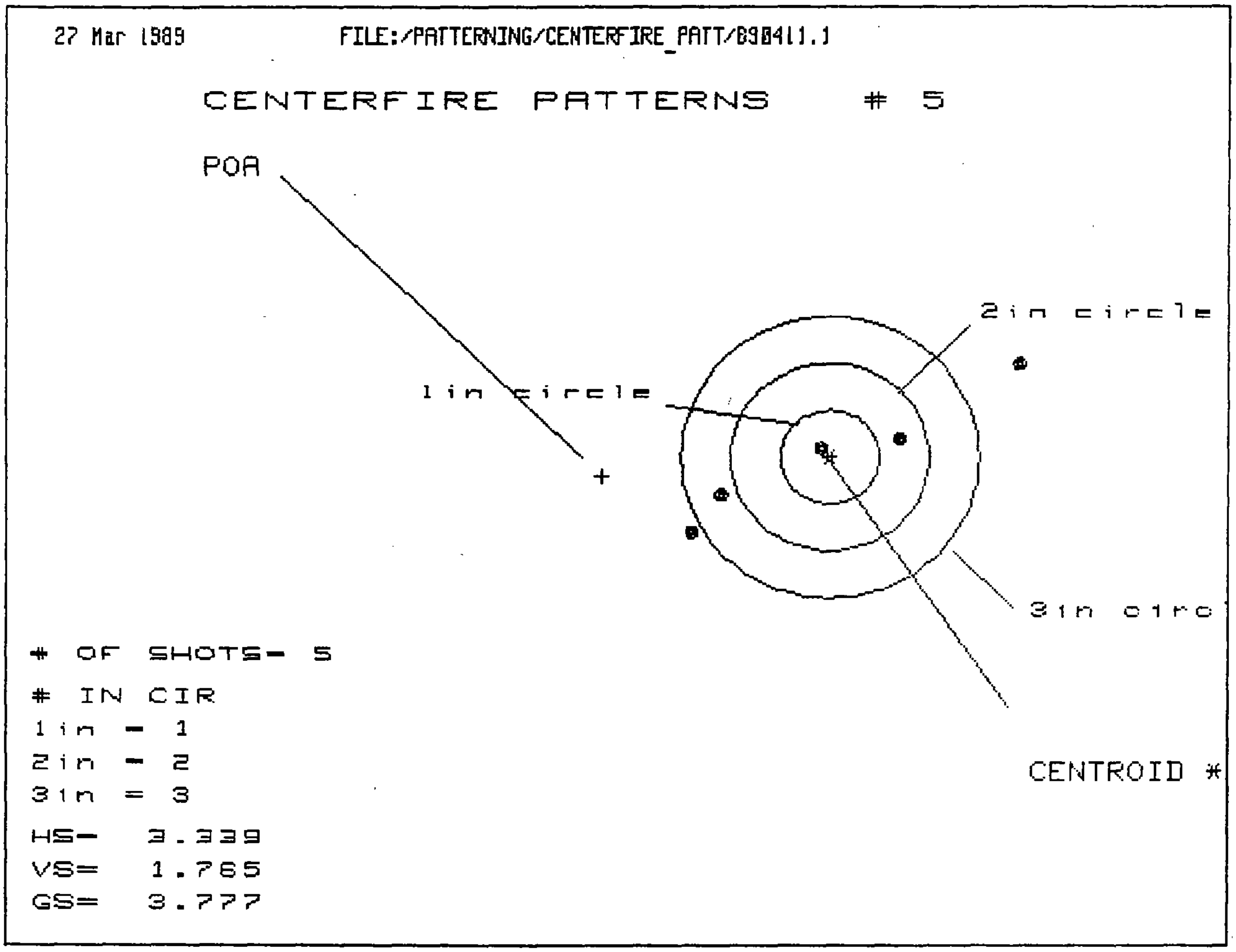
VS= 1.440

GS= 1.631

PATTERN # : 4

SHOTS (BEST OF)	:	5	4	3
MAXIMUM X	:	.555	.433	.486
MINIMUM X	:	-.616	-.738	-.685
MAXIMUM Y	:	.667	.473	.214
MINIMUM Y	:	-.773	-.379	-.221
CENTROID X	:	-.047	.074	.022
CENTROID Y	:	-.087	.106	-.051
POA TO CENTROID in.	:	.099	.130	.056
MIN RADIUS	:	.327	.406	.298
MEAN RADIUS	:	.637	.526	.500
MAX RADIUS	:	.914	.740	.718
HORIZONTAL SPREAD	:	1.171	1.171	1.171
VERTICAL SPREAD	:	1.440	.852	.435
EXTREME SPREAD	:	1.631	1.189	1.189

NUMBER IN ONE INCH CIRCLE = 1
NUMBER IN TWO INCH CIRCLE = 5
NUMBER IN THREE INCH CIRCLE = 5



PATTERN # : 5

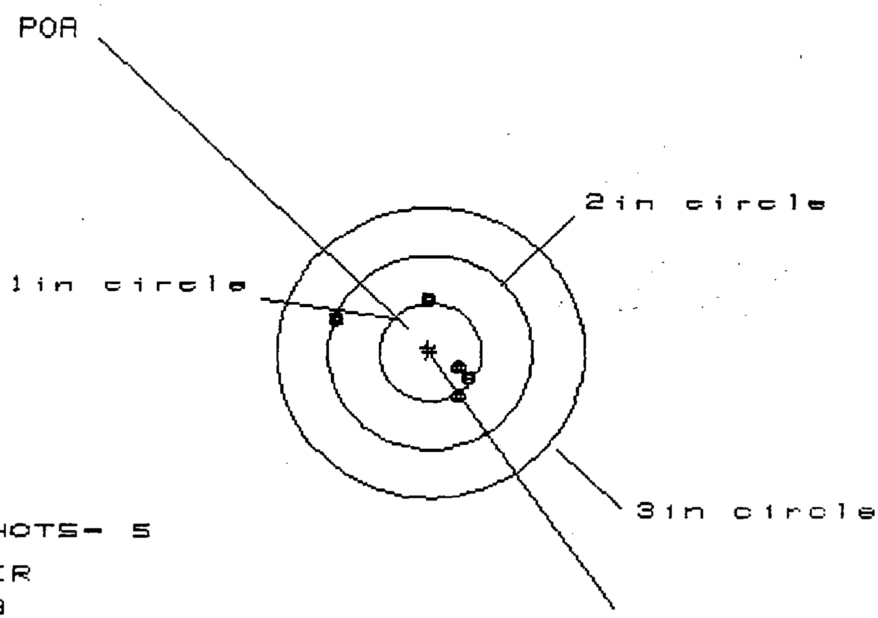
BBL. REMOVED - REMOUNTED.

SHOTS (BEST OF)	:	5	4	3
MAXIMUM X	:	1.905	1.198	.879
MINIMUM X	:	-1.434	-.958	-.928
MAXIMUM Y	:	.973	.396	.213
MINIMUM Y	:	-.792	-.549	-.346
CENTROID X	:	2.293	1.817	2.136
CENTROID Y	:	.202	-.041	.142
POA TO CENTROID in.	:	2.302	1.817	2.141
MIN RADIUS	:	.130	.485	.141
MEAN RADIUS	:	1.161	.870	.679
MAX RADIUS	:	2.139	1.262	.990
HORIZONTAL SPREAD	:	3.339	2.156	1.807
VERTICAL SPREAD	:	1.765	.945	.559
EXTREME SPREAD	:	3.777	2.354	1.891

NUMBER IN ONE INCH CIRCLE = 1
NUMBER IN TWO INCH CIRCLE = 2
NUMBER IN THREE INCH CIRCLE = 3

27 Mar 1989 FILE:/PATTERNING/CENTERFIRE_PATT/B90411

CENTERFIRE PATTERNS # 1



OF SHOTS= 5

IN CIR

1in = 3

2in = 5

3in = 5

HS= 1.324

VS= .957

GS= 1.445

AVG. G.S. = 1.33 AVG. M.R. = .4986 #C-62296208.

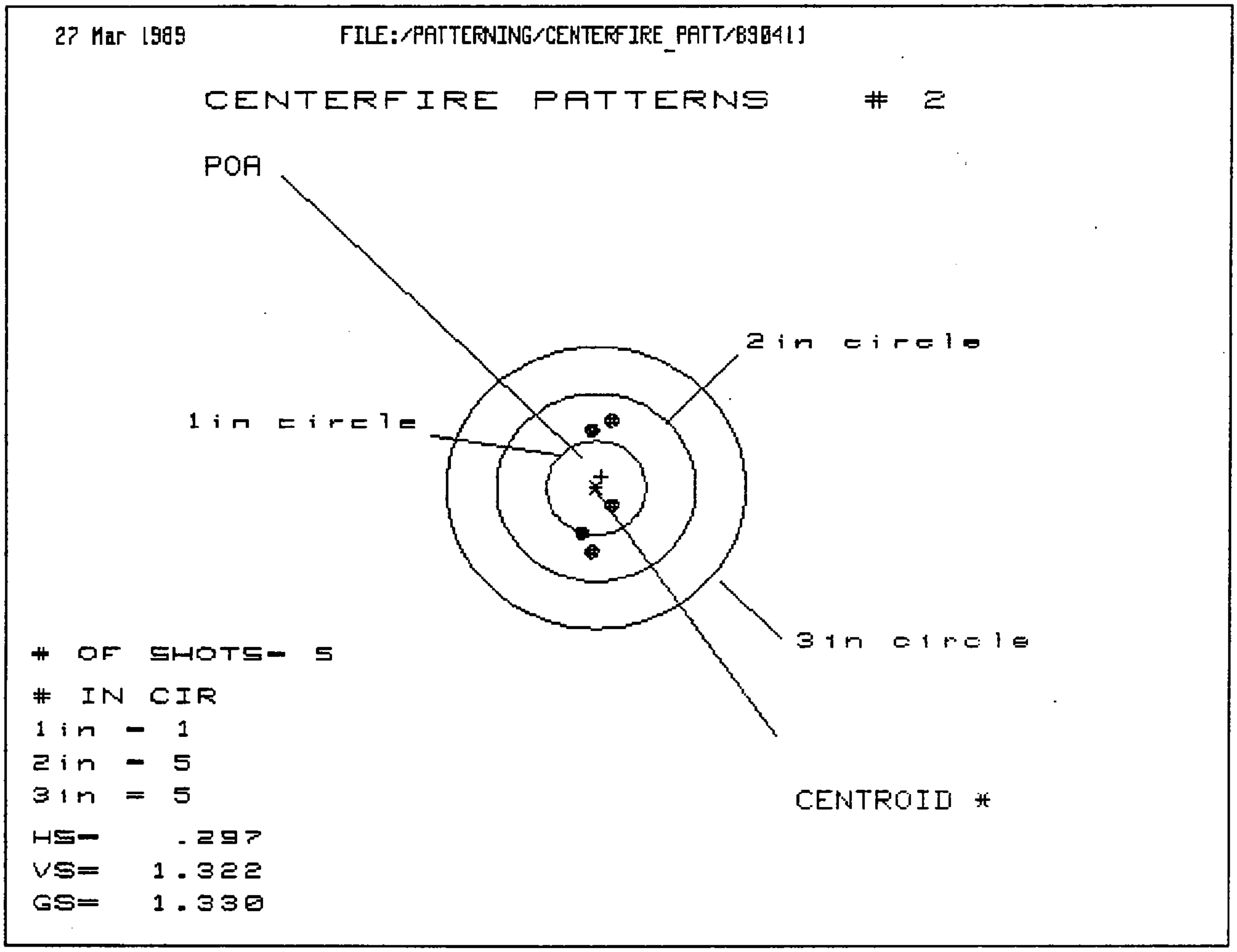
.243 WIN. SPORTER VARIANT

PATTERN # :	1		
SHOTS (BEST OF) :	5	4	3
MAXIMUM X :	.412	.184	.198
MINIMUM X :	-.912	-.267	-.253
MAXIMUM Y :	.498	.580	.454
MINIMUM Y :	-.459	-.377	-.297
CENTROID X :	.028	.256	.242
CENTROID Y :	-.048	-.130	-.004
POA TO CENTROID in.:	.056	.287	.242
MIN RADIUS :	.292	.052	.166
MEAN RADIUS :	.555	.330	.348
MAX RADIUS :	.968	.638	.520
HORIZONTAL SPREAD :	1.324	.451	.451
VERTICAL SPREAD :	.957	.957	.751
EXTREME SPREAD :	1.445	1.005	.876
NUMBER IN ONE INCH CIRCLE =		3	
NUMBER IN TWO INCH CIRCLE =		5	
NUMBER IN THREE INCH CIRCLE =		5	

Ammo:
REM. 80GR. 'POWER-LOKT" HP.
R.243W2
LOT- K/D MD2622.

SCOPE:
LYMAN ALL AMERICAN
20X.

BENCH REST 100YDS.



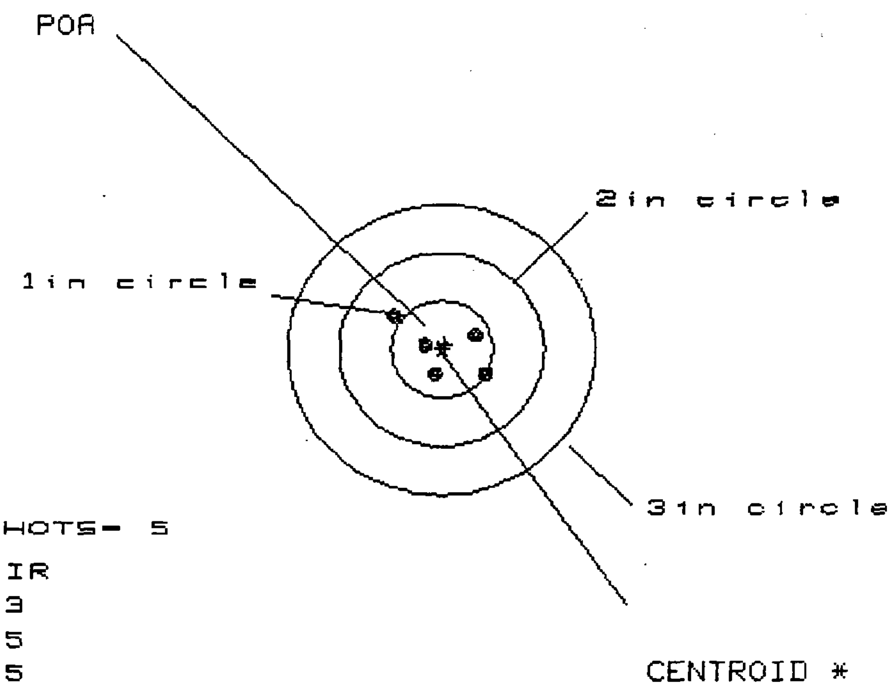
PATTERN # : 2

SHOTS (BEST OF)	:	5	4	3
MAXIMUM X	:	.126	.136	.134
MINIMUM X	:	-.171	-.140	-.142
MAXIMUM Y	:	.682	.831	.248
MINIMUM Y	:	-.640	-.470	-.193
CENTROID X	:	-.053	-.084	-.082
CENTROID Y	:	-.118	-.288	-.565
POA TO CENTROID in.	:	.129	.300	.571
MIN RADIUS	:	.225	.139	.153
MEAN RADIUS	:	.550	.450	.209
MAX RADIUS	:	.693	.831	.282
HORIZONTAL SPREAD	:	.297	.276	.276
VERTICAL SPREAD	:	1.322	1.301	.441
EXTREME SPREAD	:	1.330	1.301	.459

NUMBER IN ONE INCH CIRCLE = 1
NUMBER IN TWO INCH CIRCLE = 5
NUMBER IN THREE INCH CIRCLE = 5

27 Mar 1989 FILE:/PATTERNING/CENTERFIRE_PATT/B90411

CENTERFIRE PATTERNS # 3



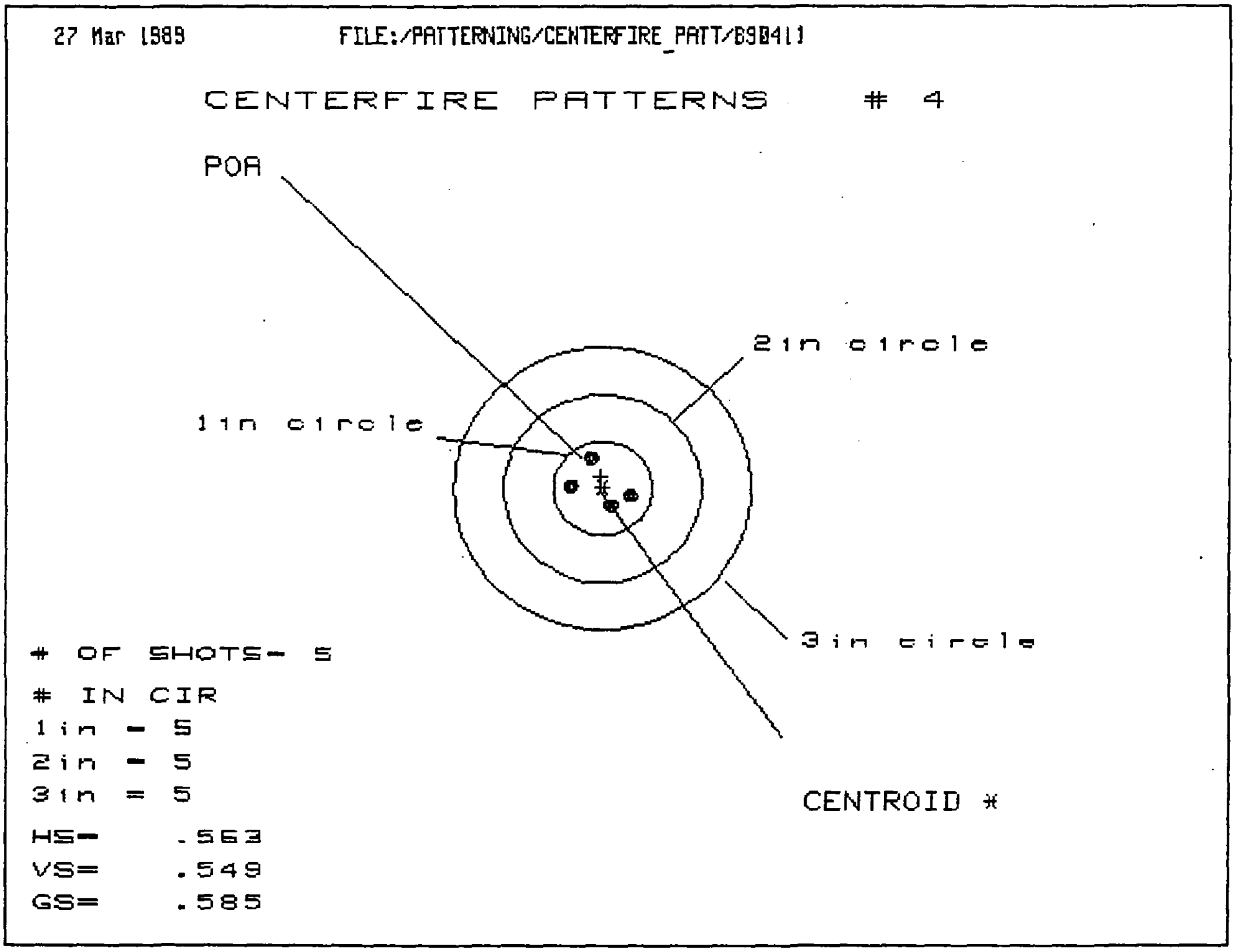
OF SHOTS= 5

# IN CIR
1in = 3
2in = 5
3in = 5

HS= .926
VS= .663
GS= 1.139

PATTERN # : 3

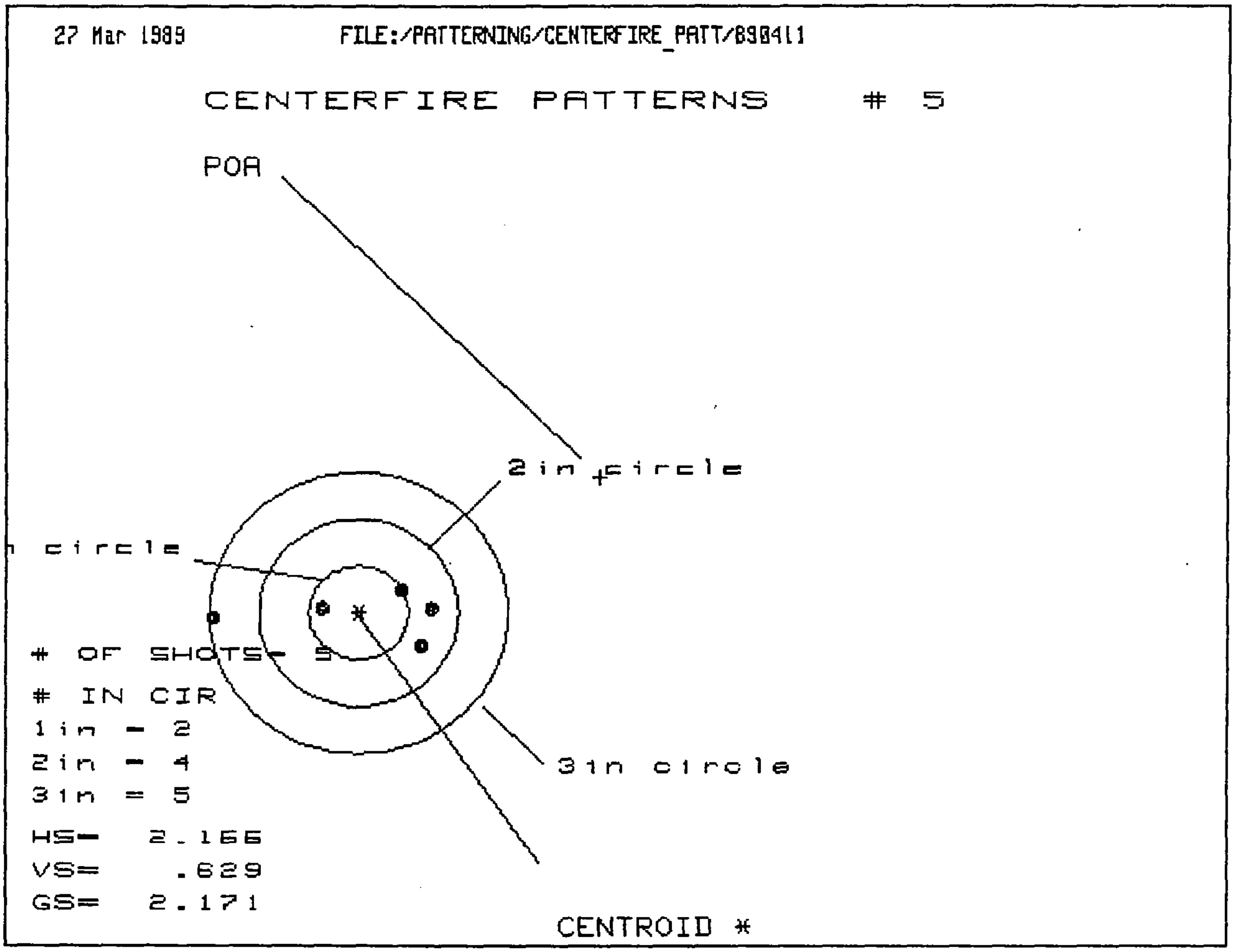
SHOTS (BEST OF)	:	5	4	3
MAXIMUM X	:	.448	.328	.290
MINIMUM X	:	-.478	-.312	-.203
MAXIMUM Y	:	.379	.221	.158
MINIMUM Y	:	-.284	-.189	-.226
CENTROID X	:	-.028	.092	-.017
CENTROID Y	:	-.049	-.144	-.081
POA TO CENTROID in.	:	.056	.171	.083
MIN RADIUS	:	.196	.256	.214
MEAN RADIUS	:	.386	.315	.262
MAX RADIUS	:	.610	.379	.331
HORIZONTAL SPREAD	:	.926	.640	.493
VERTICAL SPREAD	:	.663	.410	.384
EXTREME SPREAD	:	1.139	.716	.539
NUMBER IN ONE INCH CIRCLE	=		3	
NUMBER IN TWO INCH CIRCLE	=		5	
NUMBER IN THREE INCH CIRCLE	=		5	



PATTERN # : 4

SHOTS (BEST OF)	:	5	4	3
MAXIMUM X	:	.238	.220	.105
MINIMUM X	:	-.325	-.343	-.099
MAXIMUM Y	:	.373	.096	.052
MINIMUM Y	:	-.176	-.083	-.051
CENTROID X	:	.021	.040	.154
CENTROID Y	:	-.127	-.220	-.252
POA TO CENTROID in.	:	.128	.223	.295
MIN RADIUS	:	.130	.036	.052
MEAN RADIUS	:	.260	.187	.089
MAX RADIUS	:	.380	.357	.117
HORIZONTAL SPREAD	:	.563	.563	.204
VERTICAL SPREAD	:	.549	.179	.103
EXTREME SPREAD	:	.585	.568	.211

NUMBER IN ONE INCH CIRCLE = 5
NUMBER IN TWO INCH CIRCLE = 5
NUMBER IN THREE INCH CIRCLE = 5



BBL. REMOVED & REMOUNTED FOR POI. SHIFT.

PATTERN #	:	5		
SHOTS (BEST OF)	:	5	4	3
MAXIMUM X	:	.735	.377	.393
MINIMUM X	:	-1.431	-.683	-.557
MAXIMUM Y	:	.252	.239	.262
MINIMUM Y	:	-.377	-.390	-.367
CENTROID X	:	-2.429	-2.071	-2.197
CENTROID Y	:	-1.450	-1.437	-1.460
POA TO CENTROID in.	:	2.829	2.521	2.638
MIN RADIUS	:	.338	.242	.309
MEAN RADIUS	:	.742	.447	.471
MAX RADIUS	:	1.432	.687	.567
HORIZONTAL SPREAD	:	2.166	1.060	.950
VERTICAL SPREAD	:	.629	.629	.629
EXTREME SPREAD	:	2.171	1.060	1.060

NUMBER IN ONE INCH CIRCLE = 2
NUMBER IN TWO INCH CIRCLE = 4
NUMBER IN THREE INCH CIRCLE = 5

Report No. 890531

RESEARCH TEST & MEASUREMENT LAB WORK REQUEST

	AREA OF TESTING	
____ Developmental	____ Safety Related	____ Litigation
✓ Design Acceptance	____ Competitive Evaluation	____ Warehouse Audit
____ Pre-Pilot	____ New Design	____ Cost Reduction
____ Pilot	____ Design Change	Stake ____
____ Production Acceptance	✓ Plant Assistance	____ Other

FIREARM STAT'S.	REPORT REQ'D.	
MODEL: 700 AS	FORMAL ____	DATE REQUESTED: 2/22/89
CAL. or GAGE: .308		DATE NEEDED BY: 2/24/89
BARREL TYPE: ____	TEST RESULTS ONLY ✓	REQUESTED BY: F. H. SMITH
PROOFED: YES ✓ NO ____		WORK ORDER NO: 481152

TEST TYPE

____ Strength Test	____ Ammunition Test	____ Dry Cycle Test	____ Photo/Video
✓ Function Test	____ Environmental Test	____ Measurements	____ Other ____
____ Accuracy Test	____ Customer Complaint	____ Endurance Test	____

EXPLAIN IN DETAIL THE REASON FOR THIS TEST:

DOUBLE FIELD FUNCTION TEST FOR SHORT ACTION M/700 AS (ARYLON STOCK). TO DETERMINED IF "BDL" MAG. BOX WILL FEED PROPERLY IN ARYLON STOCKS.

GUNS REQUIRED: 10 - M/700 AS GUNS

NOTE: NO firearms or parts will be tested in the Labs unless they are accompanied by a Work Request, and both are delivered to the Labs by the designer or engineer. All Work Requests are to be filled out in detail. No Exceptions.

DATE COMPLETED: 3-6-89
TEST COMPLETED BY: CS
REPORT DATE: 3-6-89

TEST AND MEASUREMENT LAB TEST RESULTS

REQUESTER: E. Smith TESTER: C. Stephens DATE: 3/6/89
REPORT NO.: 890531 WORK ORDER NO.: 481152
WRITTEN BY: C. Stephens.
TEST TYPE: Test Results

FIREARM STAT'S : MODEL: 700 CAL or GAUGE: .308
BARREL TYPE: ____ PROOFED: YES X NO ___

REASON FOR TEST : To determine if the "BDL" magazine box will feed properly in the Arylon stocks.

EQUIPMENT REQUIRED : 10 M/700, Ammunition, Fish & Game Club.

TEST PROCEDURE : Ten M/700 with Arylon stocks and "BDL" magazines were shot for field function at the Ilion Fish & Game Club rifle range.

TEST RESULTS : A total of 1100 rounds were shot with five bolt over rides. This resulted in a .4 % malfunction rate.

FIELD CYCLE TEST - CENTERFIRE

REPROT NO.: 890531 PAGE NO.

PREVIOUS ROUNDS 0

DATE: 2/23/89 MODEL: 700 GAUGE: 308 CAL. SERIAL NO. 4379

TEST TITLE: Aylon STock

TTL. RDS. FIRED: 110
TTL. MALFUNCTIONS: 0
MALFUNCTION RATE: 0

"MALFUNCTIONS"

AMMUNITION Load Size	SHOOTER	NO. OF ROUNDS FIRED	FIRING	TRAPPED SHELL	DON'T EJECT	DON'T BLOW BACK	DON'T LOCK OPEN	FEED FROM MAG. 1st LATCH	FEED FROM MAG. 2nd LATCH	SHELL STEMS MAG.	POWER OVERRIDE	DON'T LOCK UP	STEM CHAMBER HIGH	STEM CHAMBER LOW	STEM CHAMBER RIGHT	STEM CHAMBER LEFT	SHELL JUMPS MAG.	FOLLOWER BINDS	LOADING	BOLT OVERRIDE	ACTION HANG UP	DON'T EXTRACT	BREAKAGES	ADJUSTMENTS	REPLACEMENTS	BOLT VELOCITIES	REMARKS (ON BACK) YES	REMARKS (ON BACK) NO
R308W1	5	10																										
R308W2	1																											
R308W3	2																											
R308W5	3																											
X3081	4																											
X3084	5																											
X3085	1																											
X3086	2																											
X3087	3																											
308A	4																											
308B	5																											
TOTAL (PER MAL.)																												

FIELD CYCLE TEST - CENTERFIRE

REPROT NO.: 890531 PAGE NO.

PREVIOUS ROUNDS 0

DATE: 2/23/89 MODEL: 700 GAUGE: 308 CAL. SERIAL NO. 4879

TEST TITLE: Aylen Stock

TTL. RDS. FIRED: 110
TTL. MALFUNCTIONS: 2
MALFUNCTION RATE: 1.8%

"MALFUNCTIONS"

AMMUNITION Load Size	SHOOTER	NO. OF ROUNDS FIRED	FIRING	TRAPPED SHELL	DON'T EJECT	DON'T BLOW BACK	DON'T LOCK OPEN	FEED FROM MAG. 1st LATCH	FEED FROM MAG. 2nd LATCH	SHELL STEMS MAG.	POWER OVERRIDE	DON'T LOCK UP	STEM CHAMBER HIGH	STEM CHAMBER LOW	STEM CHAMBER RIGHT	STEM CHAMBER LEFT	SHELL JUMPS MAG.	FOLLOWER BINDS	LOADING	BOLT OVERRIDE	ACTION HANG UP	DON'T EXTRACT	BREAKAGES	ADJUSTMENTS	REPLACEMENTS	BOLT VELOCITIES	REMARKS (ON BACK) YES	REMARKS (ON BACK) NO
R308W1	5	10	–																	1/1								
R308W2	5		–																	2/1								
R308W3	1		OK																									
R308W5	2																											
X3081	3																											
X3084	4																											
X3085	5																											
X3086	1																											
X3087	2																											
308A	3																											
308B	4																											
TOTAL (PER MAL.)																												

FIELD CYCLE TEST - CENTERFIRE

REPROT NO.: 890531 PAGE NO.___

PREVIOUS ROUNDS 0

DATE: 2/23/89 MODEL: 700 GAUGE: 308 CAL. SERIAL NO. 4938

TEST TITLE: Aylen STock

TTL. RDS. FIRED: 110
TTL. MALFUNCTIONS: 1
MALFUNCTION RATE: .9%

"MALFUNCTIONS"

AMMUNITION Load Size	SHOOTER	NO. OF ROUNDS FIRED	FIRING	TRAPPED SHELL	DON'T EJECT	DON'T BLOW BACK	DON'T LOCK OPEN	FEED FROM MAG. 1st LATCH	FEED FROM MAG. 2nd LATCH	SHELL STEMS MAG.	POWER OVERRIDE	DON'T LOCK UP	STEM CHAMBER HIGH	STEM CHAMBER LOW	STEM CHAMBER RIGHT	STEM CHAMBER LEFT	SHELL JUMPS MAG.	FOLLOWER BINDS	LOADING	BOLT OVERRIDE	ACTION HANG UP	DON'T EXTRACT	BREAKAGES	ADJUSTMENTS	REPLACEMENTS	BOLT VELOCITIES	REMARKS (ON BACK) YES	REMARKS (ON BACK) NO
R308W1	3	10	OK																									
R308W2	4		OK																									
R308W3	5																			2/1								
R308W5	1		OK																									
X3081	2																											
X3084	3																											
X3085	4																											
X3086	5																											
X3087	1																											
.308A	2																											
.308B	3																											
TOTAL (PER MAL.)																												

FIELD CYCLE TEST - CENTERFIRE

REPROT NO.: 890531 PAGE NO.

DATE: 2/23/89 MODEL: 700 GAUGE: 308 CAL. SERIAL NO. 3296

PREVIOUS ROUNDS 0

TEST TITLE: Axlon Stock

TTL. RDS. FIRED: 110
TTL. MALFUNCTIONS: 0
MALFUNCTION RATE: 0

"MALFUNCTIONS"

AMMUNITION Load Size	SHOOTER	NO. OF ROUNDS FIRED	FIRING	TRAPPED SHELL	DON'T EJECT	DON'T BLOW BACK	DON'T LOCK OPEN	FEED FROM MAG. 1st	FEED FROM MAG. 2nd LATCH	SHELL STEMS MAG.	POWER OVERRIDE	DON'T LOCK UP	STEM CHAMBER HIGH	STEM CHAMBER LOW	STEM CHAMBER RIGHT	STEM CHAMBER LEFT	SHELL JUMPS MAG.	FOLLOWER BINDS	LOADING	BOLT OVERRIDE	ACTION HANG UP	DON'T EXTRACT	BREAKAGES	ADJUSTMENTS	REPLACEMENTS	BOLT VELOCITIES	REMARKS (ON BACK) YES	REMARKS (ON BACK) NO
R308W1	2	10	OK																									
R308W2	3																											
R308W3	4																											
R308W5	5																											
X3081	1																											
X3084	2																											
X3085	3																											
X3086	4																											
X3087	5																											
308A	1																											
308B	2																											
TOTAL (PER MAL.)																												

FIELD CYCLE TEST - CENTERFIRE

REPROT NO.: 890531 PAGE NO.

PREVIOUS ROUNDS 0

DATE: 2/23/89 MODEL: 700 GAUGE: 308 CAL. SERIAL NO. 4908

TEST TITLE: Aylen STock

TTL. RDS. FIRED: 110
TTL. MALFUNCTIONS: 0
MALFUNCTION RATE: 0

"MALFUNCTIONS"

AMMUNITION Load Size	SHOOTER	NO. OF ROUNDS FIRED	FIRING	TRAPPED SHELL	DON'T EJECT	DON'T BLOW BACK	DON'T LOCK OPEN	FEED FROM MAG. 1st LATCH	FEED FROM MAG. 2nd LATCH	SHELL STEMS MAG.	POWER OVERRIDE	DON'T LOCK UP	STEM CHAMBER HIGH	STEM CHAMBER LOW	STEM CHAMBER RIGHT	STEM CHAMBER LEFT	SHELL JUMPS MAG.	FOLLOWER BINDS	LOADING	BOLT OVERRIDE	ACTION HANG UP	DON'T EXTRACT	BREAKAGES	ADJUSTMENTS	REPLACEMENTS	BOLT VELOCITIES	REMARKS (ON BACK) YES	REMARKS (ON BACK) NO
R308W1	1	10	OK																									
R308W2	2																											
R308W3	3																											
R308W5	4																											
X3081	5																											
X3084	1																											
X3085	2																											
X3086	3																											
X3087	4																											
308A	5																											
308B	1																											
TOTAL (PER MAL.)																												

FIELD CYCLE TEST - CENTERFIRE

REPORT NO.: 870531 PAGE NO. —

PREVIOUS ROUNDS: 0

DATE: 2/23/89 MODEL: 700 GAUGE: 308 CAL. SERIAL NO. 3872

TEST TITLE: Aylon Stock

TTL. RDS. FIRED: 110
TTL. MALFUNCTIONS: 1
MALFUNCTION RATE: .9%

"MALFUNCTIONS"

AMMUNITION Load Size	SHOOTER	NO. OF ROUNDS FIRED	FIRING	TRAPPED SHELL	DON'T EJECT	DON'T BLOW BACK	DON'T LOCK OPEN	FEED FROM MAG. 1st LATCH	FEED FROM MAG. 2nd LATCH	SHELL STEMS MAG.	POWER OVERRIDE	DON'T LOCK UP	STEM CHAMBER HIGH	STEM CHAMBER LOW	STEM CHAMBER RIGHT	STEM CHAMBER LEFT	SHELL JUMPS MAG.	FOLLOWER BINDS	LOADING	BOLT OVERRIDE	ACTION HANG UP	DON'T EXTRACT	BREAKAGES	ADJUSTMENTS	REPLACEMENTS	BOLT VELOCITIES	REMARKS (ON BACK) YES	REMARKS (ON BACK) NO
R308W1	5	10	OK																									
R308W2	1		OK																									
R308W3	2		OK																									
R308W5	3		OK																									
X3081	4		OK																									
X3084	5		OK																									
X3085	1																			2/1								
X3086	2		OK																									
X3087	3		OK																									
308A	4		OK																									
308B	5	↓	OK																									
TOTAL (PER MAL.)																												

FIELD CYCLE TEST - CENTERFIRE

REFROT NO.: 890531 PAGE NO._

PREVIOUS ROUNDS 0

DATE: 2/23/89 MODEL: 700 GAUGE: 308 CAL. SERIAL NO. 3073

TEST TITLE: Aylen Stock

TTL. RDS. FIRED: 110
TTL. MALFUNCTIONS: 0
MALFUNCTION RATE: 0

"MALFUNCTIONS"

AMMUNITION Load Size	SHOOTER	NO. OF ROUNDS FIRED	FIRING	TRAPPED SHELL	DON'T EJECT	DON'T BLOW BACK	DON'T LOCK OPEN	FEED FROM MAG. 1st LATCH	FEED FROM MAG. 2nd LATCH	SHELL STEMS MAG.	POWER OVERRIDE	DON'T LOCK UP	STEM CHAMBER HIGH	STEM CHAMBER LOW	STEM CHAMBER RIGHT	STEM CHAMBER LEFT	SHELL JUMPS MAG.	FOLLOWER BINDS	LOADING	BOLT OVERRIDE	ACTION HANG UP	DON'T EXTRACT	BREAKAGES	ADJUSTMENTS	REPLACEMENTS	BOLT VELOCITIES	REMARKS (ON BACK) YES	REMARKS (ON BACK) NO
R308W1	3	10	OK																									
R308W2	4																											
R308W3	5																											
R308W5	1																											
X3081	2																											
X3084	3																											
X3085	4																											
X3086	5																											
X3087	1																											
308A	2																											
308B	3																											
TOTAL (PER MAL.)																												

FIELD CYCLE TEST - CENTERFIRE

REPROT NO.: 890531 PAGE NO.____

PREVIOUS ROUNDS 0

DATE: 2/23/89 MODEL: 700 GAUGE: 308 CAL. SERIAL NO. 3063

TEST TITLE: Aylon STock

TTL. RDS. FIRED: 110
TTL. MALFUNCTIONS: 1
MALFUNCTION RATE: .9%

"MALFUNCTIONS"

AMMUNITION Load Size	SHOOTER	NO. OF ROUNDS FIRED	FIRING	TRAPPED SHELL	DON'T EJECT	DON'T BLOW BACK	DON'T LOCK OPEN	FEED FROM MAG. 1st LATCH	FEED FROM MAG. 2nd LATCH	SHELL STEMS MAG.	POWER OVERRIDE	DON'T LOCK UP	STEM CHAMBER HIGH	STEM CHAMBER LOW	STEM CHAMBER RIGHT	STEM CHAMBER LEFT	SHELL JUMPS MAG.	FOLLOWER BINDS	LOADING	BOLT OVERRIDE	ACTION HANG UP	DON'T EXTRACT	BREAKAGES	ADJUSTMENTS	REPLACEMENTS	BOLT VELOCITIES	REMARKS (ON BACK) YES	REMARKS (ON BACK) NO
R308W1	2																											
R308W2	3																											
R308W3	4																											
R308W5	5																											
X3081	1																											
X3084	2																											
X3085	3																											
X3086	4	16	-																	1								
X3087	5																											
308A	1																											
308B	2																											
TOTAL (PER MAL.)																												

FIELD CYCLE TEST - CENTERFIRE

REPROT NO.: 890531 PAGE NO.

PREVIOUS ROUNDS 0

DATE: 2/23/89 MODEL: 700 GAUGE: 308 CAL. SERIAL NO. 4384

TEST TITLE: Arylon Stock

TTL. RDS. FIRED: 110
TTL. MALFUNCTIONS: 0
MALFUNCTION RATE: 0

"MALFUNCTIONS"

AMMUNITION Load Size	SHOOTER	NO. OF ROUNDS FIRED	FIRING	TRAPPED SHELL	DON'T EJECT	DON'T BLOW BACK	DON'T LOCK OPEN	FEED FROM MAG. 1st LATCH	FEED FROM MAG. 2nd LATCH	SHELL STEMS MAG.	POWER OVERRIDE	DON'T LOCK UP	STEM CHAMBER HIGH	STEM CHAMBER LOW	STEM CHAMBER RIGHT	STEM CHAMBER LEFT	SHELL JUMPS MAG.	FOLLOWER BINDS	LOADING	BOLT OVERRIDE	ACTION HANG UP	DON'T EXTRACT	BREAKAGES	ADJUSTMENTS	REPLACEMENTS	BOLT VELOCITIES	REMARKS (ON BACK) YES	REMARKS (ON BACK) NO
R308W1	1	10	OK																									
R308W2	2		OK																									
R308W3	3																											
R308W5	4																											
X3081	5																											
X3084																												
X3085																												
X3086																												
X3087																												
308A																												
308B																												
TOTAL (PER MAL.)																												

FIELD CYCLE TEST - CENTERFIRE

REPORT NO.: 890531 PAGE NO. ______

PREVIOUS ROUNDS 0

DATE: 2/23/89 MODEL: 700 GAUGE: 308 CAL. SERIAL NO. 3894

TEST TITLE: Aylon STock

TTL. RDS. FIRED: 110
TTL. MALFUNCTIONS: 0
MALFUNCTION RATE: 0

"MALFUNCTIONS"

AMMUNITION Load Size	SHOOTER	NO. OF ROUNDS FIRED	FIRING	TRAPPED SHELL	DON'T EJECT (EJECTOR STUCK BACK)	DON'T BLOW BACK	DON'T LOCK OPEN	FEED FROM MAG. 1st	FEED FROM MAG. 2nd LATCH	SHELL STEMS MAG.	POWER OVERRIDE	DON'T LOCK UP	STEM CHAMBER HIGH	STEM CHAMBER LOW	STEM CHAMBER RIGHT	STEM CHAMBER LEFT	SHELL JUMPS MAG.	FOLLOWER BINDS	LOADING	BOLT OVERRIDE	ACTION HANG UP	DON'T EXTRACT	BREAKAGES	ADJUSTMENTS	REPLACEMENTS	BOLT VELOCITIES	REMARKS (ON BACK) YES	REMARKS (ON BACK) NO
R308W1	4	10	OK																									
R308W2	5																											
R308W3	1																											
R308W5	2																											
X3081	3																											
X3084	4																											
X3085	5																											
X3086	1																											
X3087	2																											
308A	3																											
308B	5/4/3	10	-		✓																							
TOTAL (PER MAL.)																												

Report No. 890412

RESEARCH TEST & MEASUREMENT LAB WORK REQUEST

	AREA OF TESTING	
X Developmental	___ Safety Related	___ Litigation
___ Design Acceptance	___ Competitive Evaluation	___ Warehouse Audit
___ Pre-Pilot	___ New Design	X Cost Reduction
___ Pilot	X Design Change	Stake ___
___ Production Acceptance	___ Plant Assistance	___ Other

FIREARM STAT'S.	REPORT REQ'D.	
MODEL: M700	FORMAL X	DATE REQUESTED: 2-10-89
CAL. or GAGE: 7mm Mag.	TEST RESULTS ONLY ___	DATE NEEDED BY: —
BARREL TYPE: Sporter		REQUESTED BY: F. Martin
PROOFED: YES X NO ___		WORK ORDER NO: 48 1007

TEST TYPE

___ Strength Test	___ Ammunition Test	___ Dry Cycle Test	___ Photo/Video
___ Function Test	___ Environmental Test	___ Measurements	___ Other ___
___ Accuracy Test	___ Customer Complaint	___ Endurance Test	___

EXPLAIN IN DETAIL THE REASON FOR THIS TEST: To Evaluate Sight Modifications Shoot Each Gun 100 Rounds To Determine Any Sight Assembly Movement - Modification Is Planned To Be Used On Customer Guns Being Returned For Sight Assembly Off Center

GUNS REQUIRED:

To Be Supplied

NOTE: NO firearms or parts will be tested in the Labs unless they are accompanied by a Work Request, and both are delivered to the Labs by the designer or engineer. All Work Requests are to be filled out in detail. No Exceptions.	DATE COMPLETED: ___ TEST COMPLETED BY: ___ REPORT DATE: ___

TEST AND MEASUREMENT LAB TEST RESULTS

REQUESTER: F. MARTIN TESTER: WEAVER DATE: 2/21/89
REPORT NO.: 890412 WORK ORDER NO.: 481007
WRITTEN BY: WEAVER
TEST TYPE:

FIREARM STAT'S : MODEL: 700 CAL or GAUGE: 7MM Mag.
BARREL TYPE: SPORTER PROOFED: YES ✓ NO ___

REASON FOR TEST :

To evaluate Sight MODIFICATIONS, TO DETERMINE any Sight ASSEMBLY MOVEMENT.

EQUIPMENT REQUIRED :

(3) M/700 RIFLES. SERIAL NOS. (C 6336226)-(C6337244)-(C6338062)
AMMUNITION USED R7MM3
JACK FUNCTIONING IN STATION #1 IN SHOOTING ROOM.

TEST PROCEDURE :

Lines WERE SCRIBED AROUND REAR AND FRONT Sights, To help identify ANY MOVEMENT OF SIGHTS. 100 ROUNDS OF R7MM3 AMMO WAS FIRED IN EACH GUN. COOLING TOOK PLACE AFTER EACH 20 ROUNDS FIRED.

TEST RESULTS :

NO VISUAL MOVEMENT APPEARED ON ANY OF THE THREE GUNS TESTED.

JACK FUNCTION — CENTERFIRE

REPORT NO.: ______ PAGE NO. 1

PREVIOUS ROUNDS 0

DATE: 2-21-89 MODEL: 700 Sporter CALIBER: 7MM REM MAG SERIAL NO. C6338062

TEST TITLE. Sight Movement

TTL. RDS. FIRED:
TTL. MALFUNCTIONS:
MALFUNCTION RATE:

"MALFUNCTIONS"

	SHOOTER	NO. OF ROUNDS FIRED	[illegible]	[illegible]	DON'T [illegible]	DON'T SLAM BACK	DON'T LOCK OPEN	FEED FROM MAG. 1st	FEED FROM MAG. 2nd / LATCH	SHELL STEMS MAG.	POWER OVERRIDE	DON'T LOCK UP	STEM CHAMBER [illegible]	STEM CHAMBER [illegible]	STEM CHAMBER [illegible]	STEM CHAMBER [illegible]	SHELL JUMPS MAG.	FOLLOWER BINDS	LOADING	BOLT OVERRIDE	ACTION BIND UP	DON'T [illegible]	[illegible]	ADJUSTMENTS	REPLACEMENTS		
R7MM3	HW	100	OK																								
TOTAL (PER MAL.)																											

JACK FUNCTION — CENTERFIRE

REPORT NO.: ____ PAGE NO. 1

PREVIOUS ROUNDS 0

DATE: 2-21-89 MODEL: 700 SPORTER CALIBER 7MMREM MAG SERIAL NO. C6336226

TEST TITLE: Sight Movement

TTL. RDS. FIRED: ____
TTL. MALFUNCTIONS: ____
MALFUNCTION RATE: ____

"MALFUNCTIONS"

	SHOOTER	NO. OF ROUNDS FIRED	FIRING	[illegible]	DON'T [illegible]	DON'T SLAM BACK	DON'T LOCK OPEN	FEED FROM MAG. 1st LATCH	FEED FROM MAG. 2nd LATCH	SHELL STEMS MAG.	POWER OVERRIDE	DON'T LOCK UP	OPEN CHAMBER [illegible]	OPEN CHAMBER [illegible]	OPEN CHAMBER [illegible]	OPEN CHAMBER [illegible]	SHELL JUMPS MAG.	FOLLOWER BINDS	LOADING	BOLT OVERRIDE	ACTION BANG UP	DON'T [illegible]	[illegible]	[illegible]	[illegible]		
R7MM3	HW	100	OK																								
TOTAL (PER MAL.)																											

JACK FUNCTION - CENTERFIRE

REPORT NO.: ____ PAGE NO. 1

DATE: 2-21-89 MODEL: 700 SPORTER CALIBER 7MM REM MAG SERIAL NO. C6337244

PREVIOUS ROUNDS 0

TEST TITLE: Sight Movement

TTL. RND. FIRED: ____
TTL. MALFUNCTIONS: ____
MALFUNCTION RATE: ____

"MALFUNCTIONS"

	[illegible]	NO. OF ROUNDS [illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	FEED FROM MAG. 1st LATCH	FEED FROM MAG. 2nd LATCH	SHELL STEMS MAG.	POWER OVERRIDE	[illegible]	STEM CHAMBER [illegible]	STEM CHAMBER [illegible]	STEM CHAMBER [illegible]	STEM CHAMBER [illegible]	SHELL JUMPS MAG.	FOLLOWER BINDS	LOADING	BOLT OVERRIDE	ACTION [illegible] UP	[illegible]	[illegible]	[illegible]	[illegible]		
R7MM3	HW	100	OK																								
TOTAL (PER MAL.)																											

TEST AND MEASUREMENT LAB - TEST REPORT

REPORT # 893111
REQUESTER: F.E. Schmidt & G.Hill
WRITTEN BY: D. Thomas
TEST TYPE: Accelerated endurance/ strength

W.O.# 481152
DATE: 12/6/89

FIREARM STAT'S: MODEL: 700 CAL: 416

REASON FOR TEST:
1) To determine the ultimate strength of the non-heat treated 416 cal. barrels.
2) To perform an accelerated endurance test on heat treated and non-heat treated barrels to determine if a fatigue failure would occur.

EQUIPMENT REQUIRED:
Three Model 700's with non-heat treated barrels for destructive test.
Serial #'s C6446367, C6446970, and C6446907
Four Model 700's barrels with a "flaw" intentionally machined into the chamber with the wire EDM.
400 rounds of 416 cal. field ammunition.
50 rounds of 416 cal proof ammunition.

TEST PROCEDURE:
1) The barrels of the three standard guns were each plugged with four bullets just in front of the chamber. The guns, one at a time, were fixtured in the iron lung and subjected to the following high pressure load.
    90 gns. of Winchester 296 powder
    400 gn. bullet with a Remington case and primer
    Estimated pressure in excess of 150000 psi

2)A) The four Model 700's with the manufactured "flaw" in the chamber were each subjected to 100 rounds of standard ammunition. Two of these guns were heat treated (C6446378 & C6446364) and two were non-heat treated (C6445138 & C6445222).

2)B) After the 100 round test each gun was subjected to 10 proof rounds.

2)C) Next two guns (C6445138 no heat treat & C6446378 heat treated) were selected from the four to be shot at -20 deg. F. Each gun in turn was placed in the freezer at -20 deg.F for a period of four hours. The proof ammunition to be shot was also placed in the freezer. After four hours each gun, in turn, was removed from the freezer along with one proof round. Before the gun can warm the proof round was fired through it. This procedure was repeated until each gun was fired five times.

NOTE: All of the shooting in 2A,B & C was done in the 52-1-A shooting room using the protective shield and a lanyard.

TEST PROCEDURE: (cont.)

2)D) The two guns not used in test 2C (C6445222 no heat treat and C6446364 heat treated) were subjected to the same ultimate strength test as the guns in test 1. The barrels were plugged with four 416 cal. bullets just ahead of the chamber and the destructive load listed above was used. This test was done in the iron lung .

TEST RESULTS:

1) The barrels of the three standard production guns with no heat treat (Serial #'s C6446367, C6446970, and C6446907) did not fail. The damage to each gun is listed below.

C6446367	Bolt locked up due to the expansion of the brass shell into the Bolt shroud. There was a one inch split in the top of the Receiver through the scope mount holes.
C6446970	Same as C6446367
C6446907	Bolt locked up due to the expansion of the brass shell into the Bolt shroud.

2) A,B,C) All four guns with the "flaw " machined into the chamber had 100 standard and 10 proof rounds shot through them with no failure. Guns C6445138 and C6446378 were shot five times each at extreme cold with cold ammunition and there were no failures.

2)D) Both guns (C6445222 no heat treat & C6446364 with heat treat) with the "flaw" machined into the chamber failed when subjected to a high pressure load with the barrel plugged. Both barrels experienced similar barrel bursts in the chamber area. These two barrels were turned over to F.E. Schmidt for analysis.

700

883411	Ejector Pin D.A.	
883501	Police Sniper T&P	
890201	300 Savage D.A.	
890611	22-250 Arylon T&P	
890721	Classic T&P	300 wby
890891	Ej. Pin Stop Washer D.A.	

xc: W.H. Coleman, II/File
T.C. Douglas
L.B. Bosquet
F.E. Martin
F.R. Wrisley
File

RESEARCH TEST AND MEASUREMENT REPORT

REPORT# 883411
W.O.# 018761
FEBRUARY 6, 1989

MODEL 700 EJECTOR RETAINING PIN DESIGN ACCEPTANCE

MODEL 700 EJECTOR RETAINING PIN DESIGN ACCEPTANCE

ABSTRACT:

Research and Development finds the Design change of the Model 700 Ejector Retaining Pin to be acceptable. The design was changed from a solid pin to a spiral pin to increase reliability and reduce scrap. The evaluation consisted of dry cycle and endurance. The sample consisted of six rifles for endurance and six bolts for dry cycle.

Prepared by: D.R. Thomas
Date Prepared: February 6, 1989

proofread and cleared by:

J.R. SNEDEKER,
Staff Engineer

J.R. Snedeker 7 Feb 89

W.H. COLEMAN, II
New Products Research Lab Director

W.H. Coleman 2/23/89

MODEL 700 EJECTOR RETAINING PIN DESIGN ACCEPTANCE

TO: J.R. Snedeker
FROM: D.R. Thomas

INTRODUCTION:

On December 13, 1988 the Research Test Lab received a request from F.R. Wrisley to conduct a Design Acceptance Evaluation of the Spiral Ejector Pin. The evaluation consisted of dry cycle and endurance.

SCOPE OF THE TEST:

To determine if the Spiral Ejector Pin would work loose or wear excessively during dry cycle and endurance.

TEST RESULTS:

The sample of the Spiral Ejector Pin was found to be acceptable in all phases of the Design Acceptance Evaluation. The results of each phase of testing were as follows:

DRY CYCLE:

There was no sign of wear or deformation in any of the bolts.

ENDURANCE:

There was no sign of wear or deformation in any of the Spiral Ejector Retaining Pins. There were no malfunctions in 15,000 rounds of endurance shooting.

REPORT TEXT:

GENERAL:

Six bolts were used for the dry cycle phase of the test:
Three control and three with spiral pins.

The following six rifles were used for the endurance phase of the Design Acceptance Evaluation:

C6326860 C6327200 C6328322 C6328540 C6326866 C6327314

The following two SWS rifles were also used for endurance testing:

C6284074 C6269697

TEST PROCEDURE:

DRY CYCLE:

Each of the six test bolts were placed in a dry cycle machine capable of depressing and releasing the Ejector repeatedly.
Two controls and two bolts with a Spiral Ejector Pin were dry cycled 10,000 cycles each. One control and one bolt with a Spiral Ejector Pin was dry cycled 20,000 cycles.
All six Ejector Pins were examined after dry cycling and were found to have no wear or deformation.

ENDURANCE:

All six test guns had the Spiral Ejector Pin in them.
500 rounds were shot through each of the six rifles.
500 additional rounds were shot through the four rifles listed below.

C6326860
C6328322
C6328540
C6326866

In addition, two SWS rifles with the Spiral Ejector Pin were enduranced to 5000 rounds each.

The ammunition used in the endurance was Remington R3006R2 & R3006R4.
The endurance test was shot from the jacks in the shooting room located in 52-1-A. Government ammunition was used in the SWS rifles.

There were no malfunctions in the endurance testing.

After the endurance was shot the Spiral Ejector Pins were removed and examined. There was no sign of wear or deformation in any of the test parts.

DES. BY DATE	DRN. BY DATE	CHK. BY DATE	APP. BY DATE
	F. MARTIN 1-25-89		KD 2/1/89

TITLE PIN - SPIROL

NUMBER	SCALE	SUPERSEDES	REFERENCE
A-94555	~		DCR 12342

REMINGTON ARMS CO. INC.
ILION RESEARCH DIV.

MODEL	PART NO.	PART USE	SEE
M700		EJECTOR PIN	
XP 100		" "	
Seven		" "	
M40XB		" "	

DO NOT SCALE THIS DRAWING: WORK TO FIGURES UNLESS OTHERWISE NOTED.
TOLERANCES ON DECIMAL DIMENSIONS ARE:
1 PLACE (.1) — TOLERANCE ± .015
2 PLACE (.01) — TOLERANCE ± .010
3 PLACE (.001) — TOLERANCE ± .005
& ON FRACTIONAL DIMENSIONS ± 1/64
& ON ANGULAR DIMENSIONS ± 00° – 30'
FINISHES ARE DESIGNATED BY ROOT MEAN SQUARE (R.M.S.) MICRO-INCH ROUGHNESS VALUES AND ARE THE MAXIMUM ROUGHNESS ACCEPTABLE. UNLESS OTHERWISE SPECIFIED.
FINISH ROUGHNESS TO BE $\sqrt{125}$ OR BETTER.

THIS DRAWING OR INFORMATION IS PROPRIETARY INFORMATION TO THE REMINGTON ARMS COMPANY, INC.

RECOMMENDED MATERIAL AND HEAT TREAT

MATERIAL ______
HEAT TREAT ______
HARDNESS ______
COLOR ______
VENDORS SPEC.

~~HEAT TREAT AND COLOR TO BE DONE BY REMINGTON~~

PURCHASE
SPIROL PIN
5/64" DIA.
3/8" LONG
STANDARD DUTY
1070 - 1095 CARBON STEEL
PLAIN FINISH (BLACK)
VENDOR SPEC. # 13423
5/64" x 3/8" MBK
FROM: CEM CO. INC.
DANIELSON. CONN.

ALT.	WAS	REF.	BY	DATE

ALTERATIONS

A-94555

FORM TFA REV. 280

H.H. SULLIVAN, INC. 502493

xc: W.H. Coleman, II/File
T.C. Douglas
L.B. Bosquet
D.R.Thomas
File

RESEARCH TEST AND MEASUREMENT REPORT

REPORT# 883501
WO# 486209
JANUARY 13,1989

TRIAL AND PILOT
MODEL 700 POLICE SNIPER RIFLE
223 CALIBER FUNCTION AND ACCURACY VERIFICATION

TRIAL AND PILOT
MODEL 700 POLICE SNIPER RIFLE
223 CALIBER FUNCTION AND ACCURACY VERIFICATION

ABSTRACT:

Research finds the Trial and Pilot Evaluation of the 223 caliber, Model 700 Police Sniper Rifles to be acceptable. The Trial and Pilot Evaluation consisted of Field Function and Accuracy. Six rifles were used for the evaluation.

Prepared by: D.R. Thomas
Date Prepared: JANUARY 13,1989

proofread and cleared by:

J.R. Snedeker
Staff Engineer

JR Snedeker 30 Jan '89

W.H. Coleman, II
New Products Research Lab Director

TRIAL AND PILOT
MODEL 700 POLICE SNIPER RIFLE
223 CALIBER FUNCTION AND ACCURACY VERIFICATION

TO: J.R. Snedeker
FROM: D.R. Thomas

INTRODUCTION:

On December 15, 1988 the Test Lab received a request to perform a Trial and Pilot Evaluation on the Model 700 Police Sniper Rifle. The evaluation used six rifles. The evaluation consisted of Field Function and Accuracy testing.

SCOPE OF THE TEST:

To determine if the production run samples would meet Remington Specifications set by the Research Design Section.

TEST RESULTS:

The production sample of the 223 caliber, Model 700 Police Sniper Rifles, was found to be acceptable. The results of the testing were as follows:

ACCURACY:

The average group size was 1.094 inches.

FUNCTION:

There were no malfunctions on any of the six rifles tested.

TRIAL AND PILOT
MODEL 700 POLICE SNIPER RIFLE
223 CALIBER FUNCTION AND ACCURACY VERIFICATION

REPORT TEXT:

GENERAL:

The following six rifles were used throughout the accuracy and function test.

B6853171 B6853262 B6853179 B6853052 B6853592 B6853351

ACCURACY:

The results showed that the 223 caliber, Model 700 Police Sniper Rifles tested met the Remington specification (1.5 inches) for group size.

All six of the rifles were used for the 100 yard accuracy testing and the following results were obtained:

100 YARD ACCURACY RESULTS

SERIAL NUMBER	GROUP 1 (in.)	GROUP 2 (in.)	GROUP 3 (in.)	AVERAGE (in.)
B6853171	.98	1.13	.78	.96
B6853262	1.39	.89	1.22	1.16
B6853179	.97	1.71	1.26	1.31
B6853052	.78	1.46	.98	1.07
B6853351	.88	.98	1.38	1.08
B6853592	1.12	.90	.92	.98

FUNCTION:

All six rifles were fired 60 rounds each in a function test conducted at the Ilion Fish and Game Club.

No malfunctions occurred.

TRIAL AND PILOT
MODEL 700 POLICE SNIPER RIFLE
223 CALIBER FUNCTION AND ACCURACY VERIFICATION

TEST PROCEDURE:

ACCURACY:

Three, five shot groups were shot with each of the six rifles selected for 100 yard accuracy. The accuracy was shot by J.E. Selan in the Research and Development 100 yard range located in building 52-1A.

Remington ammunition code R223R2 (lot# T051D0358) 55 grain "Power Lokt" hollow point was used for the accuracy testing.

Standard short action Leupold bases and rings were used in conjunction with a 20X Lyman scope.

The targets were analyzed for group size using the HP 9000 computer and digitizing tablet.

FUNCTION:

All six of the rifles were subjected to the loading and firing of 10 rounds each of six different ammunition types.

Remington R223R1	(lot# U04H D2016)	55 grain Pointed Soft Point
Remington R223R3	(lot# A 06I D1136)	55 grain Metal Case
Federal No. 223A	(lot# 3A-2322)	55 grain Soft Point
Federal No. 223B	(lot# 3A-2312)	55 grain Metal Case Boat Tail
Winchester X223R	(lot# 52TK31)	55 grain Pointed Soft Point
Winchester X223R1	(lot# 38SM90)	65 grain Full Metal Case

C.S. Stephens and A. Cooper conducted the Field Function phase of the test.

The Field Function Test was conducted at the Ilion Fish and Game Club.

Shooters were alternated every five rounds throughout the field function testing.

xc: W.H. Coleman, II/File
T.C. Douglas
L.B. Bosquet
F.E. Martin
File

RESEARCH TEST AND MEASUREMENT REPORT

REPORT# 890201
W.O.# 481152
FEBRUARY 27, 1989

MODEL 700 CLASSIC 300 SAVAGE CALIBER DESIGN ACCEPTANCE

MODEL 700 CLASSIC 300 SAVAGE CALIBER DESIGN ACCEPTANCE

ABSTRACT:

Research and Development finds the Design Acceptance Evaluation of the Model 700 Classic rifle in 300 Savage caliber to be acceptable. The evaluation consisted of Accuracy, Field Function and High Pressure Strength. A problem, not design related, was found in the six rifle sample, provided by F.E.Martin. When the problem was corrected the sample was found to be within Remington specifications for each phase of the Design Acceptance Evaluation.

Prepared by: D.R. Thomas
Date Prepared: February 27, 1989

proofread and cleared by:

J.R. SNEDEKER
Staff Engineer

J.R. Snedeker 3/15/89

W.H. COLEMAN, II
New Products Research Lab Director

W.H. Coleman II 3/15/89

MODEL 700 CLASSIC 300 SAVAGE CALIBER DESIGN ACCEPTANCE

TO: J.R. Snedeker
FROM: D.R. Thomas

INTRODUCTION:

In February of 1989 a request to conduct a Design Acceptance Evaluation of the Model 700 Classic Rifle in 300 Savage caliber was received by the Test Lab. The evaluation used six rifles and consisted of Accuracy, Field Function and High Pressure Strength.

SCOPE OF THE TEST:

To determine if the 300 Savage caliber sample would meet the Remington Specifications for accuracy, field function and strength.

TEST RESULTS:

ACCURACY:

The average group size was 1.73 inches well within the 3.5 inch specification.

FIELD FUNCTION:
The rifles failed the first Field function test with a 41% malfunction rate. It was discovered that three of the rifles had Bolts with the Ejector Retaining Pin Hole out of position. This caused an extremely high rate of "Ejector drops shell" malfunctions in these three guns. When the bolts were replaced and the Field Function shot again, there were no malfunctions.

STRENGTH:
One rifle with a plugged bore was subjected to a high pressure round. The resulting damage was typical of all caliber Model 700 rifles subjected to this test.

MODEL 700 CLASSIC 300 SAVAGE CALIBER DESIGN ACCEPTANCE

REPORT TEXT:

GENERAL:

The following six rifles were used for the Design Acceptance Evaluation:

B6772505 B6772494 B6772508 B6685216 B6323372 B6772464

ACCURACY:

Five rifles were used in the accuracy test.

Remington 150gn. PSP "CORE-LOKT" Code R30SV2 Lot # J18D-C6805 was used for accuracy.

A Lyman "All American" 20X scope was used.

Accuracy results per individual rifle are located in the appendix of this report.

FIELD FUNCTION:

All six rifles were used in the first Field Function Test. One of the rifles was used for the Strength Test before the second Field Function Test. Five rifles were used for the second Field Function Test.

The rifles were fired 70 rounds each in each of the Field Function Tests conducted at the Ilion Fish and Game Club.

The following ammo types were used in the Field Function Testing:

Remington R30SV3 & R30SV2
Federal 300A & 300B
Winchester X3001, X3003 & X3004

FIRST FIELD FUNCTION

Two of the rifles experienced no malfunctions.
Rifle B6772505 had three doesn't eject malfunctions.
Rifle B6772494 had 65 ejector drops shell malfunctions.
Rifle B6685216 had 24 ejector sticks back malfunctions.
Rifle B6323372 had 55 doesn't eject malfunctions.

FIELD FUNCTION AFTER ALL BOLTS WERE REPLACED

All five remaining rifles were fired 70 rounds each without a malfunction.

REPORT TEXT: (cont.)

STRENGTH:
Rifle B6685216 was used for the high pressure strength test.

TEST PROCEDURE:

ACCURACY:
Three, five shot groups were shot with each of the five rifles. The accuracy was shot by J.E. Selan in the Research and Development 100 yard range located in building 52-1A.

Remington ammunition code R30SV2 lot# J18D-C6805 was used for the accuracy testing.

Standard short action Leupold bases and rings were used in conjunction with a 20X All-American Lyman scope.

The targets were analyzed for group size using the HP 9000 computer and digitizing tablet.

FIELD FUNCTION:
The rifles were subjected to the loading and firing of 70 rounds of Remington and competitive 300 Savage ammunition in a field function test conducted at the Ilion Fish and Game Club. A round robin method of shooting, alternating shooters and ammunition types every ten rounds, was used throughout the field function testing.

STRENGTH:
Four bullets were lodged in the bore of rifle B6685216.
A high pressure round was developed by C. Stephens using the reloading and P&V facilities. The high pressure load consisted of 40gns. of 4227 powder and a 180gn. bullet. The high pressure round was fired in the "Iron Lung" in the measurement lab.
Estimated pressure for the destructive load was 210,000 psi.

MODEL 700 CLASSIC 300 SAVAGE CALIBER DESIGN ACCEPTANCE

APPENDIX

MODEL 700 CLASSIC 300 SAVAGE CALIBER DESIGN ACCEPTANCE

100 YARD ACCURACY RESULTS

SERIAL NUMBER	GROUP 1 (in.)	GROUP 2 (in.)	GROUP 3 (in.)	AVERAGE (in.)
B6772464	2.244	1.709	2.508	2.15
B6772494	1.337	1.799	1.777	1.64
B6772505	1.805	2.530	1.298	1.81
B6772508	1.141	1.426	1.720	1.43
B6323372	1.881	1.397	1.603	1.63
			overall average =	1.73

xc: W.H. Coleman,II/File
T.C. Douglas
L.B. Bosquet
File

RESEARCH TEST AND MEASUREMENT REPORT

REPORT# 890611
W.O.# 481152
MARCH 30, 1989

MODEL 700 RIFLE ARYLON STOCK 22-250 CALIBER
TRIAL AND PILOT EVALUATION

MODEL 700 RIFLE ARYLON STOCK 22-250 CALIBER
TRIAL AND PILOT EVALUATION

ABSTRACT:

Research and Development finds the Trial and Pilot Evaluation of the Model 700 Arylon Stock rifles in 22-250 caliber to be acceptable. The Trial and Pilot Evaluation consisted of Visual Inspection, Field Function and Accuracy. The 10 rifle sample, randomly selected from the Ilion warehouse, was found to be within Remington specifications for each phase of the Trial and Pilot Evaluation.

Prepared by: D.R. Thomas
Date Prepared: March 30, 1989

proofread and cleared by:

J.R. SNEDEKER
Staff Engineer

James R Snedeker 3 April 1989

W.H. COLEMAN, II
New Products Research Lab Director

W H Coleman 4/4/89

MODEL 700 RIFLE ARYLON STOCK 22-250 CALIBER
TRIAL AND PILOT EVALUATION

TO: J.R. Snedeker
FROM: D.R. Thomas

INTRODUCTION:

On March 2, 1989 a request to conduct a Trial and Pilot Evaluation of the Model 700 Arylon Stock, 22-250 caliber, rifles was received by the Test Lab. The evaluation was based on 10 rifles randomly selected from the Ilion warehouse, and consisted of Visual Inspection, Field Function, and Accuracy at ambient, cold and hot temperatures.

SCOPE OF THE TEST:

To determine if the production run sample would meet the Remington Specifications set by the Research Design Section.

TEST RESULTS:

The production sample of the Model 700 Arylon Stock Rifles in 22-250 caliber was found to be acceptable in all phases of the Trial and Pilot Evaluation. The results of each phase of testing are as follows:

VISUAL:

The overall appearance of the rifles was good.

ACCURACY:

Remington specification for accuracy is 2.2 inches.
The average group sizes for the Model 700 Arylon in 22-250 are as follows:

AMBIENT	1.31 inches
+150°F	1.35 inches
-22°F	1.41 inches

FIELD FUNCTION:

Eight of the ten rifles tested functioned with no malfunctions.
Two of the ten rifles each had one feeding malfunction out of forty rounds of field testing for a 2.5% malfunction rate.
The overall malfunction rate for the Field Function test is .5%.

MODEL 700 RIFLE ARYLON STOCK 22-250 CALIBER
TRIAL AND PILOT EVALUATION

REPORT TEXT:

GENERAL:

The following ten rifles were randomly selected from the Ilion warehouse for the Trial and Pilot Evaluation:

C6358617	C6360604	C6360424	C6360603	C6360321
C6360504	C6360496	C6360594	C6360617	C6360464

VISUAL INSPECTION:

The visual inspection committee finds the overall visual appearance of the Trial and Pilot sample to be acceptable.

The visual inspection committee consisted of J.E. Selan, L.B. Bosquet, R.F. Leskovar, and D.R. Thomas.

All ten of the rifles were used in the Visual Inspection.

Comments on each rifle are located in the appendix.

FIELD FUNCTION:

All ten of the rifles were fired 40 rounds each in a field function test conducted at the Ilion Fish and Game Club.

The following ammunition types were used in the field function test:

Remington	R22501
Remington	R22502
Winchester	X222501
Federal	P22250B

The following rifles were shot 40 rounds each with no malfunctions:

C6360594	C6360603	C6360321	C6360496
C6360504	C6360604	C6360424	C6358617

Rifle # C6360617 was shot 40 rounds and had one "bolt override" with R22502 for a 2.5% malfunction rate.

Rifle # C6360464 was shot 40 rounds and had one "stems chamber low" with R22501 for a 2.5% malfunction rate.

The overall malfunction rate for the sample is .5%.

MODEL 700 RIFLE ARYLON STOCK 22-250 CALIBER
TRIAL AND PILOT EVALUATION

REPORT TEXT: (cont.)

ACCURACY:

The results showed that the Model 700 Arylon Rifles, 22-250 caliber, met the Remington specification (2.2 inches) for group size.

The following five rifles were used in the accuracy test:

C6360496 C6360464 C6360504 C6360594 C6360424

Remington ammunition code R22501 (22-250 PSP) lot# T21H D3710 was used for the accuracy testing.

Standard long action Leupold bases and rings were used in conjunction with a 20X Lyman All American scope.

Remington specification for accuracy is 2.2 inches.
The average group sizes for the Model 700 Arylon in 22-250 are as follows:

AMBIENT	1.31 inches
$+150^{\circ}$F	1.35 inches
-22°F	1.41 inches

Accuracy results per individual rifle are located in the appendix of this report.

TEST PROCEDURE:

VISUAL INSPECTION:

All ten rifles were examined.

Each rifle was wiped down with a clean white Coyne towel and examined by each committee member. All comments were recorded.

FIELD FUNCTION:

All ten rifles were subjected to the loading and firing of 40 rounds in a field function test conducted at the Ilion Fish and Game Club. A round robin method of shooting, alternating shooters every ten rounds, was used throughout the field function testing.

Each of the ten guns had ten rounds each of R22501, R22502, X222501, and P22250B ammunition shot through it.

MODEL 700 RIFLE ARYLON STOCK 22-250 CALIBER
TRIAL AND PILOT EVALUATION

ACCURACY:

The accuracy was shot by J.E. Selan in the Research and Development 100 yard range located in building 52-1A.

At room temperature, three, five shot groups were shot with each of the five rifles selected for 100 yard accuracy.

The five rifles were placed in an oven for 24 hours at 150 Degrees Fahrenheit, then removed and allowed to return to room temperature. At this time the 100 yard accuracy test was reshot.

The five rifles were placed in a freezer for 24 hours at -22 Degrees Fahrenheit, then removed and allowed to return to room temperature. At this time the 100 yard accuracy was reshot.

The targets were analyzed for group size using the HP 9000 computer and digitizing tablet.

MODEL 700 RIFLE ARYLON STOCK 22-250 CALIBER
TRIAL AND PILOT EVALUATION

APPENDIX

MODEL 700 RIFLE ARYLON STOCK 22-250 CALIBER
TRIAL AND PILOT EVALUATION

VISUAL INSPECTION:

GENERAL COMMENTS:

The appearance of the 22-250 caliber, Model 700 Rifles, with Arylon stocks was good.

There were no visual defects severe enough to reject the sample however, the following items were noted in the visual inspection:

All stocks have a seam or parting line.

COMMENTS PER INDIVIDUAL RIFLE:

C6358617	Glue on grip cap Space between grip cap and stock Mold line on stock
C6360604	Glue on grip cap Slight mar on barrel Space between butt pad and stock
C6360424	Poor fit butt pad Paint chipped from floor plate
C6360603	1/8 inch margin at tang Poor fit butt pad Paint chipped around take down screws
C6360321	Poor fit butt pad Slight gouge front of bolt handle slot
C6360504	Poor fit butt pad Flashing rear of bolt handle slot Poor color bow of trigger guard
C6360496	Poor fit butt pad Slight mar on bolt plug Slight crush right side of barrel channel
C6360594	Glue on grip cap Barrel off center in groove Upset on bolt handle where it contacts cam surface
C6360464	Flashing rear of bolt handle slot
C6360617	Gouge in bolt handle slot

MODEL 700 RIFLE ARYLON STOCK 22-250 CALIBER
TRIAL AND PILOT EVALUATION

100 YARD ACCURACY RESULTS

(Remington specification 2.2 inches)

AMBIENT

SERIAL NUMBER	GROUP 1 (in.)	GROUP 2 (in.)	GROUP 3 (in.)	AVERAGE (in.)
C6360496	.988	1.566	1.284	1.28
C6360464	1.190	1.722	1.166	1.36
C6360504	1.096	1.771	1.465	1.44
C6360594	.837	1.454	1.343	1.21
C6360424	1.522	1.540	.669	1.24

AVERAGE 1.31

150°F

SERIAL NUMBER	GROUP 1 (in.)	GROUP 2 (in.)	GROUP 3 (in.)	AVERAGE (in.)
C6360496	1.412	1.257	1.672	1.45
C6360464	1.034	1.174	1.501	1.24
C6360504	.997	1.034	1.422	1.15
C6360594	1.417	1.775	1.606	1.60
C6360424	.765	1.949	1.161	1.30

AVERAGE 1.35

-22°F

SERIAL NUMBER	GROUP 1 (in.)	GROUP 2 (in.)	GROUP 3 (in.)	AVERAGE (in.)
C6360496	1.307	1.237	1.697	1.41
C6360464	1.804	1.632	1.177	1.54
C6360504	.643	1.574	1.310	1.18
C6360594	1.835	2.080	1.292	1.74
C6360424	1.052	1.330	1.114	1.17

AVERAGE 1.408

xc: W.H. Coleman, II/File
T.C. Douglas
L.B. Bosquet
File

RESEARCH TEST AND MEASUREMENT REPORT

REPORT# 890721
W.O.# 486209
MARCH 16, 1989

MODEL 700 CLASSIC RIFLE 300 WEATHERBY CALIBER TRIAL AND PILOT EVALUATION

MODEL 700 CLASSIC RIFLE 300 WEATHERBY CALIBER
TRIAL AND PILOT EVALUATION

ABSTRACT:

Research and Development finds the Trial and Pilot Evaluation of the 300 Weatherby caliber, Model 700 Classic Rifles to be acceptable. The Trial and Pilot Evaluation consisted of Visual Inspection, Field Function and Accuracy. The 10 rifle sample, randomly selected from a 20 rifle sample, was found to be within Remington specifications for each phase of the Trial and Pilot Evaluation.

Prepared by: D.R. Thomas
Date Prepared: March 16, 1989

proofread and cleared by:

J.R. SNEDEKER
Staff Engineer

JR Snedeker 16 Mar '89

W.H. COLEMAN, II
New Products Research Lab Director

W H Coleman II 3/17/89

MODEL 700 CLASSIC RIFLE 300 WEATHERBY CALIBER
TRIAL AND PILOT EVALUATION

TO: J.R. Snedeker
FROM: D.R. Thomas

INTRODUCTION:

On March 13, 1989 a request to conduct a Trial and Pilot Evaluation of the 300 Weatherby caliber, Model 700 Classic Rifles was received by the Test Lab. The evaluation used 10 rifles, randomly selected from a production rifle sample and consisted of Visual Inspection, Accuracy and Field Function.

SCOPE OF THE TEST:

To determine if the production run sample would meet the Remington Specifications set by the Research Design Section.

TEST RESULTS:

The production sample of the 300 Weatherby caliber, Model 700 Classic Rifles was found to be acceptable in all phases of the Trial and Pilot Evaluation. The results of each phase of testing were as follows:

VISUAL:

The overall appearance of the rifles was good.

ACCURACY:

The average group size was 1.85 inches.
Remington specification for accuracy is 3.5 inches.

FIELD FUNCTION:

All of the five rifles tested experienced no malfunctions.

MODEL 700 CLASSIC RIFLE 300 WEATHERBY CALIBER
TRIAL AND PILOT EVALUATION

REPORT TEXT:

GENERAL:

The following ten rifles were randomly selected from the production sample for the Trial and Pilot Evaluation:

C6329053	C6347818	C6348495	C6348312	C6348343
C6341560	C6348385	C6348296	C6348311	C6347961

VISUAL INSPECTION:

The visual inspection committee finds the overall visual appearance of the Trial and Pilot sample to be acceptable.

All ten of the rifles were used in the Visual Inspection.

Comments on each rifle are located in the appendix.

FIELD FUNCTION:

Five of the rifles were fired 30 rounds each in a field function test conducted at the Ilion Fish and Game Club and the following results were established:

All five of the rifles experienced no malfunctions.

The following five rifles were used in the field function test:

C6348311 C6348296 C6341560 C6348385 C6347961

ACCURACY:

The results showed that the 300 Weatherby caliber, Model 700 Classic Rifles tested met the Remington specification (3.5 inches) for group size.

The following five rifles were used in the accuracy test:

C6329053 C6347818 C6348495 C6348312 C6348343

The average group size for the five rifles used in the accuracy test was 1.85 inches.

Accuracy results per individual rifle are located in the appendix of this report.

MODEL 700 CLASSIC RIFLE 300 WEATHERBY CALIBER
TRIAL AND PILOT EVALUATION

TEST PROCEDURE:

VISUAL INSPECTION:

The visual inspection committee consisted of J.E. Selan, R. Howe, M. Paestella, and D.R. Thomas.

All ten rifles were examined.

Each rifle was wiped down with a clean white Coyne towel and examined by each committee member. All comments were recorded.

FIELD FUNCTION:

Five of the ten rifles were subjected to the loading and firing of 30 rounds in a field function test conducted at the Ilion Fish and Game Club. A round robin method of shooting, alternating shooters every ten rounds, was used throughout the field function testing.

Each of the five guns had ten rounds each of R300WB2, Weatherby 150gn. and Weatherby 180gn. ammunition shot through it.

ACCURACY:

Three, five shot groups were shot with each of the five rifles selected for 100 yard accuracy. The accuracy was shot by J.E. Selan in the Research and Development 100 yard range located in building 52-1A.

Remington ammunition code R300WB2 (220gn. SPCL) lot# K-16K B0623 was used for the accuracy testing.

Standard long action Leupold bases and rings were used in conjunction with a 20X Lyman All American scope.

The targets were analyzed for group size using the HP 9000 computer and digitizing tablet.

MODEL 700 CLASSIC RIFLE 300 WEATHERBY CALIBER
TRIAL AND PILOT EVALUATION

APPENDIX

MODEL 700 CLASSIC RIFLE 300 WEATHERBY CALIBER
TRIAL AND PILOT EVALUATION

VISUAL INSPECTION:

GENERAL COMMENTS:

The appearance of the 300 Weatherby caliber, Model 700 Classic Rifle sample was good.

There were no visual defects severe enough to reject the sample however, the following items were noted in the visual inspection:

COMMENTS PER INDIVIDUAL RIFLE:

C6329053	Finish run on stock
C6347818	Bright spot on barrel
C6348495	Recoil pad spacer chipped at toe
C6348312	Small dent in right panel of stock mar on the top of the bolt handle
C6348343	Chip-out at front swivel Bright spot on bolt plug
C6341560	Chip-out at rear swivel Small white spot in finish Floor plate mars stock when closed
C6348385	Wood torn in barrel channel Small dent in fore-end
C6348296	Poor wood repair in checkering Poor polish on bolt handle Bolt plug marred
C6348311	Small bright mar on barrel
C6347961	Three small mars on stock Bolt plug marred

MODEL 700 CLASSIC RIFLE 300 WEATHERBY CALIBER
TRIAL AND PILOT EVALUATION

100 YARD ACCURACY RESULTS

(Remington specification 3.5 inches)

SERIAL NUMBER	GROUP 1 (in.)	GROUP 2 (in.)	GROUP 3 (in.)	AVERAGE (in.)
C6329053	2.13	1.85	1.65	1.88
C6347818	.83	2.11	2.88	1.94
C6348495	1.59	1.40	2.22	1.74
C6348312	1.31	2.50	1.92	1.91
C6348343	1.85	2.17	1.39	1.80

AVERAGE GROUP SIZE 1.85 inches

xc: W.H. Coleman, II/File
T.C. Douglas
L.B. Bosquet
F.E. Martin
E.R. Owens
File

RESEARCH TEST AND MEASUREMENT REPORT

REPORT# 890891
W.O.# 481152
JUNE 26, 1989

MODEL 700 EJECTOR PIN STOP WASHER DESIGN ACCEPTANCE

MODEL 700 EJECTOR PIN STOP WASHER DESIGN ACCEPTANCE

ABSTRACT:

Research and Development finds the material change of the Model 700 Ejector Pin Stop Washer, from 8640 to 4130, to be acceptable. The evaluation consisted of dry cycle testing of twenty Model 700 Bolts. Ten Bolts had Ejector Pin Stop Washers of 8640 material and ten Bolts had Ejector Pin Stop Washers of 4130 material.

Prepared by: D.R. Thomas
Date Prepared: June 26, 1989

proofread and cleared by:

J.R. SNEDEKER,
Staff Engineer

W.H. COLEMAN, II
New Products Research Lab Director

J.R. Snedeker
Wm H Coleman III 6/29/89

MODEL 700 EJECTOR PIN STOP WASHER DESIGN ACCEPTANCE

TO: J.R. Snedeker
FROM: D.R. Thomas

INTRODUCTION:

On March 3, 1989 the Research Test Lab received a request from F.E. Martin to conduct a Design Acceptance Evaluation of the 4130 material Ejector Pin Stop Washer.

SCOPE OF THE TEST:

To determine if the Ejector Pin Stop Washer made from the proposed 4130 material would deform or wear excessively during dry cycle.

TEST RESULTS:

The sample of the 4130 Ejector Pin Stop Washers was found to be acceptable with no apparent wear or deformation after dry cycle testing.

MODEL 700 EJECTOR PIN STOP WASHER DESIGN ACCEPTANCE

REPORT TEXT:

GENERAL:

Twenty bolts were used for the dry cycle test:
Ten control (8640 material) and ten of 4130 material.
Testing was done by R.Howe in the dry cycle testing room located in building 52-1-A.

TEST PROCEDURE:

DRY CYCLE:

Each of the twenty test bolts were placed in a Test Lab action, in the bolt action cock and fire dry cycle machine. Nine of each material type were dry cycled to 25,000 cycles each. One of each material type was dry cycled to 50,000 cycles. All twenty Bolts were cut off approximately 1 5/8 inches from the locking lug end, and the Ejector Pin Stop Washers were examined.
All test samples regardless of dry cycle level showed only slight visual difference, with no apparent wear or deformation.

881681 700 Classic 35 Whelen T&P
881721 700 Safari .416 STrength
881723 700 Mountain 7x57 D.A.
882011 700 Mountain 243 Function & Accuracy
882432 700 300wby Mag SPorT Accuracy

882442 700 STrength .458 Win. MAg
883001 700 Laminated STock (300L)

RD-69-B

REMINGTON ARMS COMPANY, INC.

INTER-DEPARTMENTAL CORRESPONDENCE

Remington. DUPONT   PETERS DUPONT

"CONFINE YOUR LETTER TO ONE SUBJECT ONLY"

xc: W.H. Coleman, II/File
T.C. Douglas
B.L. Bosquet
F.L. Supry
File

RESEARCH TEST AND MEASUREMENT REPORT

REPORT# 881681
JUNE 17, 1988

MODEL 700 CLASSIC 35 WHELEN CALIBER TRIAL AND PILOT EVALUATION

MODEL 700 CLASSIC 35 WHELEN CALIBER TRIAL AND PILOT EVALUATION

ABSTRACT:

Research and Development finds the Trial and Pilot Evaluation of the 35 Whelen caliber, Model 700 Classic rifles to be acceptable. The Trial and Pilot Evaluation consisted of Visual Inspection, Field Function and Accuracy. The 10 rifle sample, randomly selected from an 20 rifle sample, was found to be within Remington specifications for each phase of the Trial and Pilot Evaluation.

Prepared by: F.L. Supry
Date Prepared: June 17, 1988

proofread and cleared by:

H.C. MUNSON, Quality Resource — H.C. Munson

W.H. COLEMAN, II
New Products Research Lab Director — Wm H Coleman II 6/20/88

MODEL 700 CLASSIC 35 WHELEN CALIBER TRIAL AND PILOT EVALUATION

TO: H.C. Munson
FROM: F.L. Supry

INTRODUCTION:

In June, 1988, a request to conduct a Trial and Pilot Evaluation of the 35 Whelen caliber, Model 700 Classic rifles was received by the Test Lab. The evaluation used 10 rifles, randomly selected from a production rifle sample and consisted of Visual Inspection, Pattern Evaluation and Field Function.

SCOPE OF THE TEST:

To determine if the production run sample would meet the Remington Specifications set by the Research Design Section.

TEST RESULTS:

The production sample of the 35 Whelen caliber, Model 700 Classic rifles was found to be acceptable in all phases of the Trial and Pilot Evaluation. The results of each phase of testing were as follows:

VISUAL:

The overall appearance of the rifles was good.

ACCURACY:

The average group size was 1.77 inches.

FIELD FUNCTION:

Eight of the rifles experienced no malfunctions.

The two rifles that had malfunctions (one DX and two DE on C6241041, and four stem magazine left on C6216053) during the first function test, experienced no malfunctions in an additional 80 round function test after an extractor change and magazine box adjustment respectively.

REPORT TEXT:

GENERAL:

The following ten rifles were randomly selected from the production sample for the Trial and Pilot Evaluation:

C6240976	C6241033	C6241047	C6240971	C6241041
C6240958	C6241087	C6216558	C6216053	C6240945

VISUAL INSPECTION:

The visual inspection committee finds the overall visual appearance of the Trial and Pilot sample to be acceptable.

All ten of the rifles were used in the Visual Inspection.

Comments on each rifle are located in the appendix.

FIELD FUNCTION:

The ten rifles were fired 20 rounds each in a field function test conducted at the Ilion Fish and Game Club and the following results were established:

Eight of the rifles experienced no malfunctions.

Rifle C6241041 had one don't extract and two don't eject malfunctions during the function test. The extractor was replaced on this rifle by production employees and the rifle was fired an additional 80 rounds with no malfunctions.

Rifle C6216053 had four stem magazine left malfunctions during the function test. The magazine box was adjusted by production employees and the rifle was fired an additional 80 rounds with no malfunctions.

ACCURACY:

The results showed that the 35 Whelen caliber, Model 700 Classic rifles tested met the Remington specification (3.5 inches) for group size.

The following five rifles were used in the accuracy test:

C6240976	C6241033	C6241047	C6240971	C6241041

The average group size for the five rifles used in the accuracy test was 1.77 inches.

Accuracy results per individual rifle are located in the appendix of this report.

TEST PROCEDURE:

VISUAL INSPECTION:

The visual inspection committee consisted of R.F. Leskovar, R.W. Howe, F.L. Supry, and D.R. Thomas.

All ten rifles were examined.

Each rifle was wiped down with a clean white Coyne towel and examined by each committee member. All comments were recorded.

FIELD FUNCTION:

The ten rifles were subjected to the loading and firing of 20 rounds 250 grain Remington 35 Whelen ammunition in a field function test conducted at the Ilion Fish and Game Club. A round robin method of shooting, alternating shooters every five rounds, was used throughout the field function testing.

ACCURACY:

Three, five shot groups were shot with each of the five rifles selected for 100 yard accuracy. The accuracy was shot by D.R. Thomas and J.E. Selan in the Research and Development 100 yard range located in building 52-1A.

Remington ammunition code (J02G-C8905) R35WH2 (250 grain SP) was used for the accuracy testing.

Standard long action Leupold bases and rings were used in conjunction with a 12X Redfield scope.

The targets were analyzed for group size using the HP 9000 computer and digitizing tablet.

MODEL 700 CLASSIC 35 WHELEN CALIBER TRIAL AND PILOT EVALUATION

APPENDIX

MODEL 700 CLASSIC 35 WHELEN CALIBER TRIAL AND PILOT EVALUATION

VISUAL INSPECTION:

GENERAL COMMENTS:

The appearance of the 35 Whelen caliber, Model 700 Classic sample was good.

There were no visual defects severe enough to reject the sample however, the following items were noted in the visual inspection:

COMMENTS PER INDIVIDUAL RIFLE:

C6240945	CHATTER MARKS ON BOLT PLUG
C6216558	CHATTER MARKS ON BOLT PLUG LIGHT FILL IN TWO SMALL KNOTS LEFT SIDE OF STOCK
C6240976	CHATTER MARKS ON BOLT PLUG
C6216053	CHATTER MARKS ON BOLT PLUG
C6241033	CHATTER MARKS ON BOLT PLUG BRIGHT MAR ON TRIGGER GUARD OPEN KNOT ON STOCK
C6241087	BRIGHT MAR ON REAR STRAP SCREW PIN HOLES AND DULL AREA ON STOCK
C6241047	CHATTER MARKS ON BOLT PLUG
C6241041	NICE LOOKING WOOD
C6240971	POOR REPAIR AROUND CROSS PIN
C6240958	POOR FILL JOB ON THE STOCK

MODEL 700 CLASSIC 35 WHELEN CALIBER TRIAL AND PILOT EVALUATION

100 YARD ACCURACY RESULTS

SERIAL NUMBER	GROUP 1 (in.)	GROUP 2 (in.)	GROUP 3 (in.)	AVERAGE (in.)
C6240976	1.73	1.58	2.17	1.83
C6241033	1.41	1.53	2.01	1.65
C6241047	1.35	1.70	2.01	1.69
C6240971	2.85	1.90	1.19	1.98
C6241041	1.78	1.05	2.20	1.68

Report No. 881721

RESEARCH TEST & MEASUREMENT LAB WORK REQUEST

	AREA OF TESTING	
___ Developmental	___ Safety Related	___ Litigation
X Design Acceptance	___ Competitive Evaluation	___ Warehouse Audit
___ Pre-Pilot	___ New Design	___ Cost Reduction
___ Pilot	X Design Change	Stake ___
___ Production Acceptance	___ Plant Assistance	___ Other

[illegible] Custom Shop Offering

FIREARM STAT'S.	**REPORT REQ'D.**	
MODEL: M-700	FORMAL X	DATE REQUESTED: 6-20-88
CAL. or GAGE: .416 Rem		DATE NEEDED BY: A.S.A.P.
BARREL TYPE: SAFARI	TEST RESULTS ONLY ___	REQUESTED BY: F. Martin
PROOFED: YES X NO ___		WORK ORDER NO: 481152

TEST TYPE

X Strength Test	___ Ammunition Test	___ Dry Cycle Test	___ Photo/Video
___ Function Test	___ Environmental Test	___ Measurements	___ Other ___
___ Accuracy Test	___ Customer Complaint	___ Endurance Test	___

EXPLAIN IN DETAIL THE REASON FOR THIS TEST:

On Rifle Supplied Perform Intentional Abuse Test

- 5 Bullet Barrel Obstruction
- Adequate Load To Destroy

(Barrel Plugged 6-22-88 R.W.H.) 4320

Pressure Barrel # Has Been Given To Test Lab

GUNS REQUIRED: Supplied

NOTE: NO firearms or parts will be tested in the Labs unless they are accompanied by a Work Request, and both are delivered to the Labs by the designer or engineer. All Work Requests are to be filled out in detail. No Exceptions.	DATE COMPLETED: ___ TEST COMPLETED BY: ___ REPORT DATE: ___

TEST AND MEASUREMENT LAB TEST RESULTS

REQUESTER: F. Martin   TESTER: C. Stephens   DATE: 07/14/88
REPORT NO.: 881721   WORK ORDER NO.: 481152
WRITTEN BY: C. Stephens
TEST TYPE:

FIREARM STAT'S : MODEL: 700   CAL or GAUGE: .416
BARREL TYPE: PROOFED: YES X NO

REASON FOR TEST : To determine if a M/700 rifle in .416 caliber will withstand the abuse of a high pressure round.

EQUIPMENT REQUIRED : 700 rifle in .416 caliber. Loading room & dies, P&U Range, Ohler system, PCB transducer, amplifier, Measurement Lab and Iron lung.

TEST PROCEDURE : The barrel of the rifle was plugged with 4 410gr. bullets. A high pressure round was developed using various powders and loads until an exceptable pressure could be determined. The load consisted of 90gr. 296 powder a 400gr. bullet and a Remington case. The gun was placed in the iron lung, loaded and fired.

TEST RESULTS : The results show that the M/700 in .416 caliber will withstand the abuse of a high pressure round.

REMINGTON ARMS COMPANY, INC.
Ilion Research Division

SUMMARY OF INTENTIONAL GUN ABUSE TEST

DATA

By C. Stephens

Date 14 July 88

FIREARM:
Make Remington
Model 700
Grade
Gauge .416
Serial Number C6254608
Origin
Test Number Assigned 881721
Comments Barrel Plugged with 4 410gr. bullets

HISTORY:
Condition New
Previous Rounds Fired 0
Headspace at Test –
Test Date 14 July 88

ABUSIVE LOAD USED:
Powder Type 296
Powder Weight 90gr.
Case Make and Type Rem.
Total Bullet Weight 400gr.
Total Shot Weight
Estimated Pressure 750+ K

ADDITIONAL COMMENTS: Cracked Stock. Broke floor plate off. Cracked top of receiver at front mounting holes. Bolt locked up

RO-69-B

REMINGTON ARMS COMPANY, INC.

INTER-DEPARTMENTAL CORRESPONDENCE

Remington. DU PONT   PETERS DU PONT

"CONFINE YOUR LETTER TO ONE SUBJECT ONLY"

xc: W.H. Coleman, II/File
T.C. Douglas
L.B. Bosquet
F.E. Martin
F.L. Supry
File

RESEARCH TEST AND MEASUREMENT REPORT

REPORT# 881723
JUNE 30, 1988

MODEL 700 MOUNTAIN RIFLE 7X57 CALIBER DESIGN ACCEPTANCE

MODEL 700 MOUNTAIN RIFLE 7X57 CALIBER DESIGN ACCEPTANCE

ABSTRACT:

Research and Development finds the Design Acceptance Evaluation of the Model 700 Mountain Rifle, 7X57 caliber rifles to be acceptable. The evaluation consisted of Accuracy and Field Function. The six rifle sample, provided by F.E.Martin, was found to be within Remington specifications for each phase of the Design Acceptance Evaluation.

Prepared by: F.L. Supry
Date Prepared: June 30, 1988

proofread and cleared by:

H.C. MUNSON, Quality Resource — H C Munson

W.H. COLEMAN, II
New Products Research Lab Director — Wm H Coleman II

MODEL 700 MOUNTAIN RIFLE 7X57 CALIBER DESIGN ACCEPTANCE

TO: H.C. Munson
FROM: F.L. Supry

INTRODUCTION:

In June, 1988, a request to conduct a Design Acceptance Evaluation of the Model 700 Mountain Rifle, 7X57 caliber rifles was received by the Test Lab. The evaluation used six rifles and consisted of Accuracy and Field Function.

SCOPE OF THE TEST:

To determine if the 7X57 caliber sample would meet the Remington Specifications for accuracy and field function.

TEST RESULTS:

The sample of the 7X57 caliber, Model 700 Mountain Rifle was found to be acceptable in all phases of the Design Acceptance Evaluation. The results of each phase of testing were as follows:

The overall appearance of the rifles was good.

ACCURACY:

The average group size was 2.250 inches.

FIELD FUNCTION:

Four of the rifles experienced no malfunctions.

The two rifles that had malfunctions (one stem chamber on C6252543 and five stem chambers on C6252965) during the first function test, experienced no malfunctions after magazine box adjustments, in an additional 100 round and 200 round function test respectively.

REPORT TEXT:

GENERAL:

The following six rifles were used for the Design Acceptance Evaluation:

C6252543 C6252625 C6212166 C6252965 C6252609 C6209218

ACCURACY:

The results showed that the Model 700 Mountain Rifle, 7X57 caliber, met the Remington specification (2.7 inches) for group size.

All six rifles were used in the accuracy test.

The average group size for the six rifles used in the accuracy test was 2.250 inches.

The group size for Rifle C6252625 averaged 2.755 inches, which is .055 inches out of specification for a 7X57 caliber rifle. Examination of the rifle showed that the action was not properly bedded in the stock.. The action was re-bedded by J.E. Selan and the rifle reshot. The group size for the rifle, after the re-bedding, averaged 1.729 inches.

Accuracy results per individual rifle are located in the appendix of this report.

FIELD FUNCTION:

The six rifles were fired 70 rounds each in a field function test conducted at the Ilion Fish and Game Club and the following results were established:

Four of the rifles experienced no malfunctions.

Rifle C6252543 had one stem chamber malfunction with R7MSR 175 grain SP Remington ammunition. The magazine box was adjusted and an additional 100 rounds of R7MSR were fired with no malfunctions.

Rifle C6252965 had one stem chamber malfunction with R7MSR 175 grain SP Remington ammunition and four stem chamber malfunctions with 7A 175 grain Federal ammunition. The magazine was adjusted and 100 rounds of each ammunition type were fired with no malfunctions.

TEST PROCEDURE:

ACCURACY:

Three, five shot groups were shot with each of the six rifles. The accuracy was shot by D.R. Thomas and J.E. Selan in the Research and Development 100 yard range located in building 52-1A.

Remington ammunition code (R191-D0000) R7MSR (175 grain SP) was used for the accuracy testing.

Standard long action Leupold bases and rings were used in conjunction with a 20X All-American Lyman scope.

The targets were analyzed for group size using the HP 9000 computer and digitizing tablet.

FIELD FUNCTION:

The six rifles were subjected to the loading and firing of 70 rounds of Remington and competitive 7X57 ammunition in a field function test conducted at the Ilion Fish and Game Club. A round robin method of shooting, alternating shooters and ammunition types every ten rounds, was used throughout the field function testing.

The addition function testing was conducted using a shooting jack in the shooting room located in building 52-2A.

The following ammunition types were used in the field test:

REMINGTON	R7MSR1	140 GRAIN POINTED SOFT POINT
	R7MSR	175 GRAIN SOFT POINT
RWS	7X57	162 GRAIN CONE POINT
IMPERIAL	7MM7X57	160 GRAIN SOFT POINT
WINCHESTER	X7MM	175 GRAIN SOFT POINT
FEDERAL	7B	139 GRAIN SOFT POINT
	7A	175 GRAIN SOFT POINT

MODEL 700 MOUNTAIN RIFLE 7X57 CALIBER DESIGN ACCEPTANCE

APPENDIX

MODEL 700 MOUNTAIN RIFLE 7X57 CALIBER DESIGN ACCEPTANCE

100 YARD ACCURACY RESULTS

SERIAL NUMBER	GROUP 1 (in.)	GROUP 2 (in.)	GROUP 3 (in.)	AVERAGE (in.)
C6209218	2.578	2.419	1.495	2.164
C6252965	3.253	2.267	1.380	2.300
C6212166	3.010	3.133	1.647	2.600
C6252609	3.044	2.472	1.443	2.320
C6252543	3.760	1.520	1.885	2.388
C6252625	1.748	2.303	1.135	1.729
		overall average =		2.250

HD-49-B

REMINGTON ARMS COMPANY, INC.

INTER-DEPARTMENTAL CORRESPONDENCE

Remington. DU PONT　　PETERS DU PONT

"CONFINE YOUR LETTER TO ONE SUBJECT ONLY"

xc: W.H. Coleman, II/File
T.C. Douglas
L.B. Bosquet
F.L. Supry
File

RESEARCH TEST AND MEASUREMENT REPORT

REPORT# 882011
JULY 22, 1988

MODEL 700 MOUNTAIN RIFLE
243 CALIBER FUNCTION AND ACCURACY VERIFICATION

MODEL 700 MOUNTAIN RIFLE
243 CALIBER FUNCTION AND ACCURACY VERIFICATION

ABSTRACT:

The Trial and Pilot Evaluation of the Model 700 Mountain Rifle, in the short caliber action, was completed and accepted using the 7MM-08 caliber rifles as the test vehicle. The introduction of the short caliber action also includes the 308 and 243 calibers. As these calibers become available the function and accuracy will be verified by the Research Test and Measurement Laboratory.

The 243 caliber Model 700 Mountain Rifles tested met Remington specifications (2.2 inches) for group size. The five rifles tested shot an average group size of 1.62 inches. There were no malfunctions during the function test.

Prepared by: F.L. Supry
Date: July 22, 1988

MODEL 700 MOUNTAIN RIFLE
243 CALIBER FUNCTION AND ACCURACY VERIFICATION

TO: H.C. Munson
FROM: F.L. Supry

INTRODUCTION:

In July, 1988, a second request to conduct a Function and Accuracy evaluation of the 243 caliber, Model 700 Mountain Rifles was received by the Test Lab. The first request was received in May, 1988, and that sample was rejected (refer to Report# 881313) because three of the five samples did not meet Remington 100 yard accuracy specifications for 243 caliber rifles.

Each evaluation used five rifles selected from a production rifle sample in the Ilion warehouse.

SCOPE OF THE TEST:

To determine if the production run samples would meet Remington Specifications set by the Research Design Section.

TEST RESULTS:

The production sample of the 243 caliber, Model 700 Mountain Rifles, was found to be acceptable. The results of the testing were as follows:

ACCURACY:

The average group size was 1.62 inches.

FUNCTION:

There were no malfunctions on any of the five rifles tested.

MODEL 700 MOUNTAIN RIFLE
243 CALIBER FUNCTION AND ACCURACY VERIFICATION

REPORT TEXT:

GENERAL:

The following five rifles were used throughout the accuracy and function test.

C6228993 C6237357 C6237437 C6237431 C6237395

ACCURACY:

The results showed that the 243 caliber, Model 700 Mountain Rifles tested met the Remington specification (2.2 inches) for group size.

All five of the rifles were used for the 100 yard accuracy testing and the following results were obtained:

100 YARD ACCURACY RESULTS

SERIAL NUMBER	GROUP 1 (in.)	GROUP 2 (in.)	GROUP 3 (in.)	AVERAGE (in.)
C6228993	1.21	1.73	1.74	1.56
C6237357	1.87	1.75	2.07	1.90
C6237437	1.97	2.53	1.92	2.14
C6237431	1.32	0.95	1.47	1.25
C6237395	1.02	1.13	1.58	1.24

FUNCTION:

All five rifles were fired 20 rounds each in a function test conducted in the R&D 200 yard range.

No malfunctions occurred.

MODEL 700 MOUNTAIN RIFLE
243 CALIBER FUNCTION AND ACCURACY VERIFICATION

TEST PROCEDURE:

ACCURACY:

Three, five shot groups were shot with each of the five rifles selected for 100 yard accuracy. The accuracy was shot by J.E. Selan and D.R. Thomas in the Research and Development 100 yard range located in building 52-1A.

Remington ammunition code (A18C D3405) R243W3 (100 grain PSP) was used for the accuracy testing.

Standard short action Leupold bases and rings were used in conjunction with a 20X Lyman scope.

The targets were analyzed for group size using the HP 9000 computer and digitizing tablet.

FUNCTION:

All five of the rifles were subjected to the loading and firing of 20 rounds 100 grain pointed soft point Remington 243 caliber ammunition in a function test conducted at the R&D 200 yard range.

Report No. 882432 ~~881271~~ (A)

RESEARCH TEST & MEASUREMENT LAB WORK REQUEST

X Developmental	**AREA OF TESTING**
___ Design Acceptance	___ Safety Related ___ Litigation
___ Pre-Pilot	___ Competitive Evaluation ___ Warehouse Audit
___ Pilot	___ New Design ___ Cost Reduction
___ Production Acceptance	X Design Change Stake ___
	___ Plant Assistance ___ Other

FIREARM STAT'S.	REPORT REQ'D.	
MODEL: M. 700	FORMAL ___	DATE REQUESTED: 8-30-88
CAL. or GAGE: 300 Wby	TEST RESULTS ONLY ✓	DATE NEEDED BY: ASAP
BARREL TYPE: Mag Sport		REQUESTED BY: F. MARTIN
PROOFED: YES X NO ___		WORK ORDER NO: 481153

TEST TYPE

___ Strength Test	X Ammunition Test	___ Dry Cycle Test	___ Photo/Video
___ Function Test	___ Environmental Test	___ Measurements	___ Other ___
X Accuracy Test	___ Customer Complaint	___ Endurance Test	___

EXPLAIN IN DETAIL THE REASON FOR THIS TEST:

Subsequent To Job # 881271
With Ammo Supplied From Conoke Shoot
Sample Guns For Accuracy 3x5 Per

GUNS REQUIRED:

NOTE: NO firearms or parts will be tested in the Labs unless they are accompanied by a Work Request, and both are delivered to the Labs by the designer or engineer. All Work Requests are to be filled out in detail. No Exceptions.

DATE COMPLETED: 10-21-88
TEST COMPLETED BY: J. SELAN
REPORT DATE: 10-24-88

F.E. MARTIN
FILE

TEST AND MEASUREMENT LAB TEST RESULTS

REQUESTER: F.E. MARTIN   TESTER: J. SELAN - A. Cooper   DATE: 10/21/88
REPORT NO.: 882432   WORK ORDER NO.: 481153
WRITTEN BY: J. SELAN
TEST TYPE: DEVELOPMENTAL

FIREARM STAT'S : MODEL: ~~700 CLASSIC~~ WEATHERBY - MARK-V   CAL or ~~GAUGE~~: 300 WEATHERBY MAG.
BARREL TYPE: MAG. SPORT   PROOFED: YES ✓ NO ___

REASON FOR TEST :

TO DETERMINE ACCURACY OF AMMO SUPPLIED BY LONOKE IN .300 WEATHERBY MAG.

EQUIPMENT REQUIRED :

6 - M-700's CLASSICS. #C6202843 - #B6896103 - #B6896067 - #C6209215 - #C6209210 - #B6896118
1 MARK-V - WEATHERBY - #23792
AMMO: 300 WEATHERBY MAG - 190 GR. PSP.
20X LYMAN ALL AMERICAN SCOPE - 1 SCOPE BASE (LEUPOLD - LA.RH) - 1 SET - LEUPOLD 1 IN. (MED.) RINGS.
100 YD. RANGE -
CLEANING RODS - HOPPE'S #9 SOLVENT. BUSHNELL - BORE SIGHTER. - ASSORTED PATCHES.
DIGITIZING BOARD - CALCOMP #9100 AND - H.P. #9000

TEST PROCEDURE : 3 X 5 SHOT GROUPS PER RIFLE.
IN STALL SCOPE. BORE SIGHT.
WIRE BRUSH WITH HOPPE'S #9 SOLVENT - PATCH DRY.
ZERO FOR P.O.I. - RECLEAN
FIRE ONE FOULING SHOT.
SHOOT 5 SHOT GROUP UNTIL 3 GROUPS COMPLETED.
COOL BETWEEN EACH GROUP
REPEAT - CLEANING AND FIRING PROCEDURE.

TEST RESULTS :

GROUPS		1	2	3	AVG.	MEAN RADIUS 1	2	3	AVG
C6202843	(J.S.)	1.701	2.356	1.577	1.878	.537	.922	612	.690
B6896103	(A.C.)	2.71	2.232	2.136	2.36	.830	.741	.749	.773
B6896067	(J.S.)	2.077	2.38	1.889	2.115	.831	1.050	.754	.875
C6209215	(J.S.)	.664	1.172	1.633	1.156	.301	.467	526	.431
C6209210	(J.S.)	1.158	1.584	1.621	1.454	.374	.608	.548	.51
B6896118	(J.S.)	1.302	1.956	1.732	1.663	.484	.759	.529	.591
23792 WHBY - MAG - CONTROL	(J.S.)	3.807	2.653	1.856	2.772	1.137	1.032	.716	962

AGGRIGATE OF 700 CLASSICS - 2.125

AGGRIGATE OF 700 CLASSICS - .774

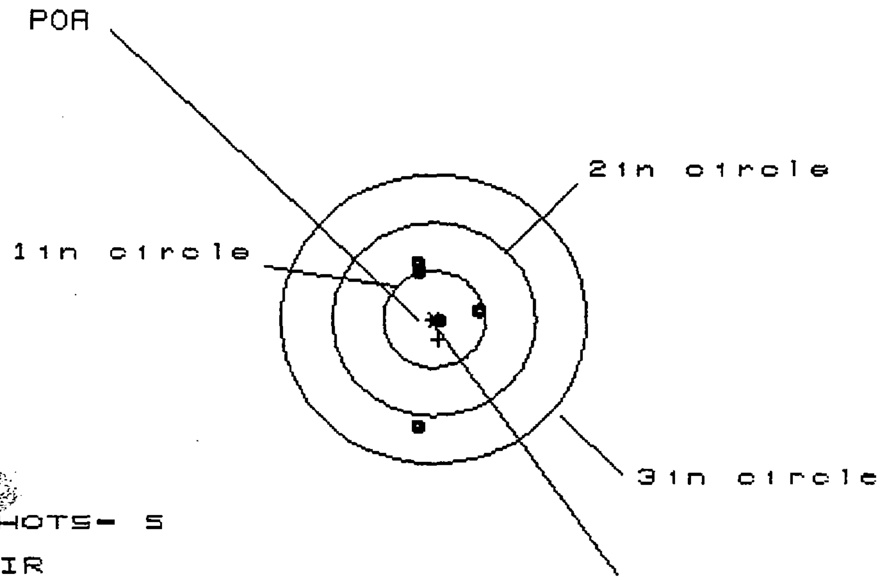
CONFIDENTIAL-SUBJECT TO PROTECTIVE ORDER
KINZER V. REMINGTON

R2538371

C -

21 Oct 1988 FILE:/PATTERNING/CENTERFIRE_PATT/882432

CENTERFIRE PATTERNS # 1



\# OF SHOTS= 5
\# IN CIR
1in = 2
2in = 4
3in = 5

HS= .568
VS= 1.700
GS= 1.701

AVG-G.S = 1.878
A.M.R= .690

\# C6202843 (J.E.S.)

M/700 "CLASSIC."
.300 WHBY. MAG.
REM. 190 GR. PSP.

PATTERN #	:	1		
SHOTS (BEST OF)	:	5	4	3
MAXIMUM X	:	.401	.373	.314
MINIMUM X	:	-.167	-.194	-.254
MAXIMUM Y	:	.550	.263	.292
MINIMUM Y	:	-1.150	-.284	-.197
CENTROID X	:	-.048	-.021	.039
CENTROID Y	:	-.208	.495	.408
POA TO CENTROID in.	:	.213	.496	.410
MIN RADIUS	:	.027	.282	.206
MEAN RADIUS	:	.537	.325	.307
MAX RADIUS	:	1.155	.416	.387
HORIZONTAL SPREAD	:	.568	.568	.568
VERTICAL SPREAD	:	1.700	.547	.489
EXTREME SPREAD	:	1.701	.710	.688

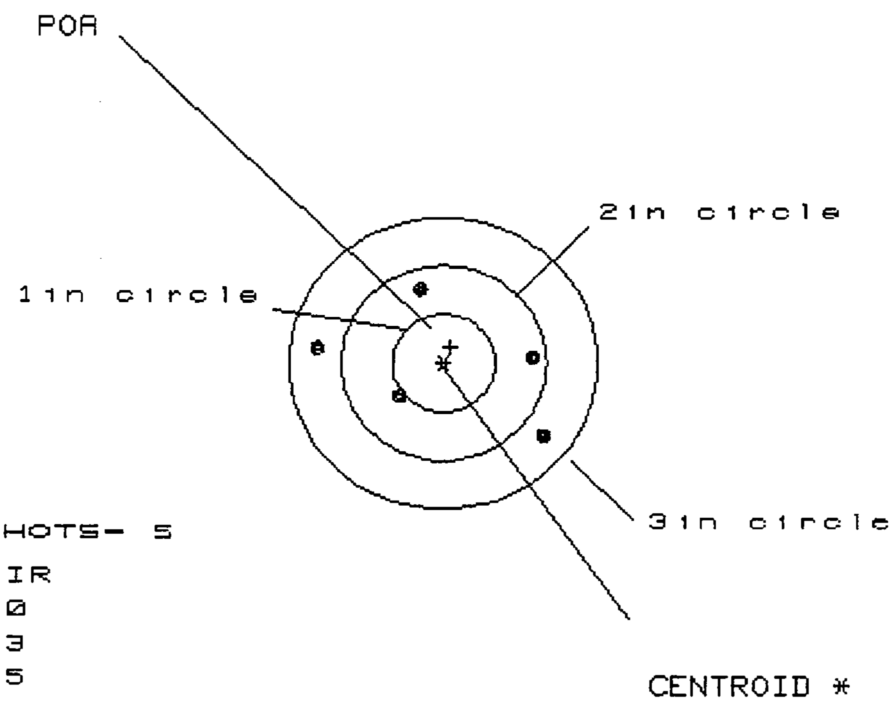
LYMAN 20X SCOPE - ALL-AMERICAN

100 YDS. SAND BAG REST.

NUMBER IN ONE INCH CIRCLE = 2
NUMBER IN TWO INCH CIRCLE = 4
NUMBER IN THREE INCH CIRCLE = 5

21 Oct 1988 FILE:/PATTERNING/CENTERFIRE_PATT/882432

CENTERFIRE PATTERNS # 2



OF SHOTS- 5

IN CIR

1in - 0

2in - 3

3in = 5

HS- 2.179

VS= 1.518

GS= 2.356

PATTERN # : 2

SHOTS (BEST OF)	:	5	4	3
MAXIMUM X	:	.990	1.088	.774
MINIMUM X	:	-1.189	-.941	-.476
MAXIMUM Y	:	.794	.613	.609
MINIMUM Y	:	-.724	-.489	-.493
CENTROID X	:	-.069	-.317	-.003
CENTROID Y	:	-.161	.021	.024
POA TO CENTROID in.	:	.175	.318	.024
MIN RADIUS	:	.513	.516	.678
MEAN RADIUS	:	.922	.791	.715
MAX RADIUS	:	1.227	1.094	.783
HORIZONTAL SPREAD	:	2.179	2.029	1.250
VERTICAL SPREAD	:	1.518	1.102	1.102
EXTREME SPREAD	:	2.356	2.032	1.306

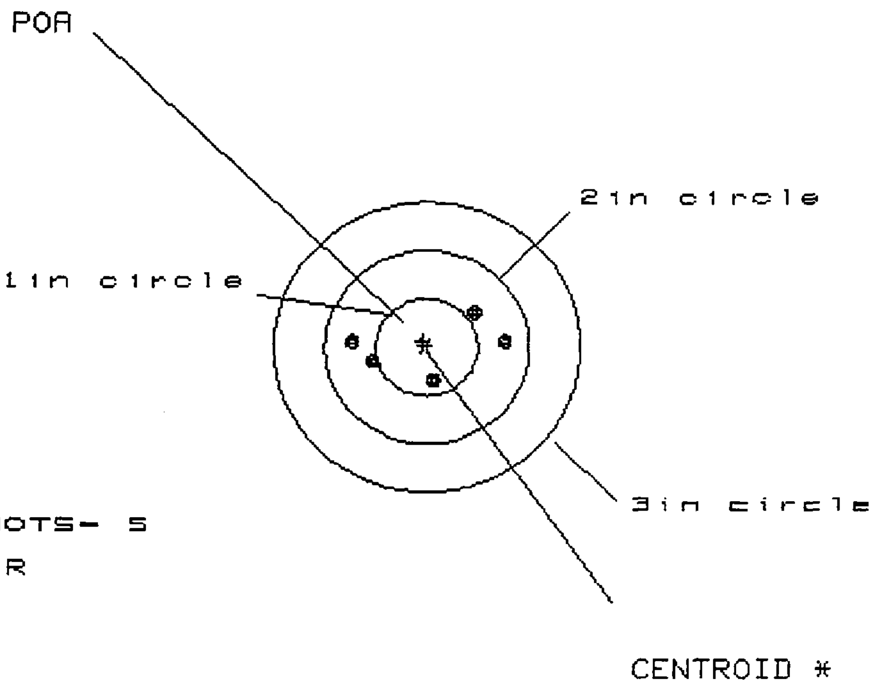
NUMBER IN ONE INCH CIRCLE = 0

NUMBER IN TWO INCH CIRCLE = 3

NUMBER IN THREE INCH CIRCLE = 5

21 Oct 1988 FILE:/PATTERNING/CENTERFIRE_PATT/882432

CENTERFIRE PATTERNS # 3



\# OF SHOTS= 5

\# IN CIR
1in = 1
2in = 5
3in = 5

HS= 1.577
VS= .769
GS= 1.577

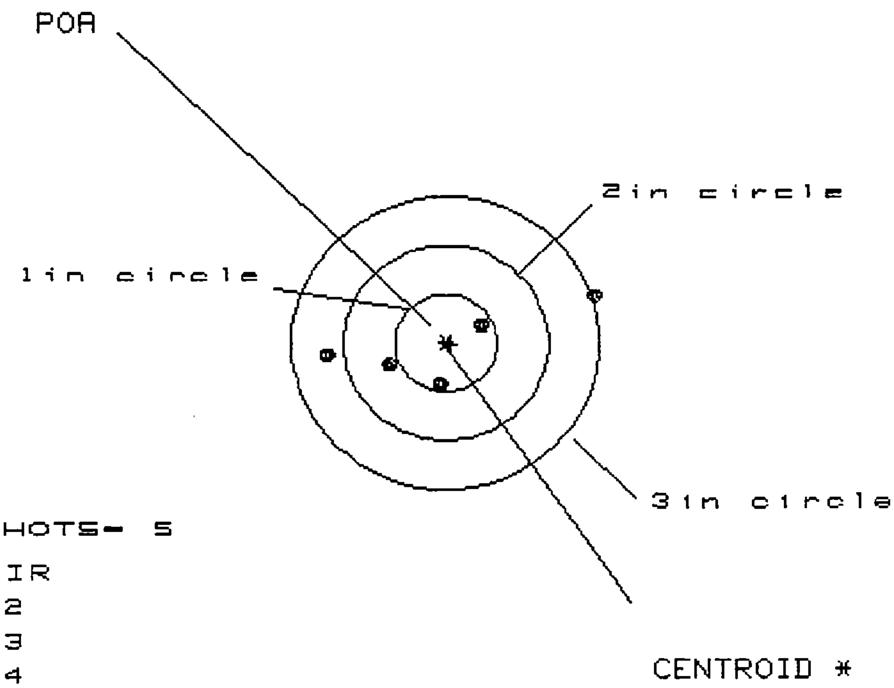
PATTERN # : 3

SHOTS (BEST OF)	:	5	4	3
MAXIMUM X	:	.804	.621	.430
MINIMUM X	:	-.773	-.572	-.493
MAXIMUM Y	:	.395	.412	.435
MINIMUM Y	:	-.374	-.357	-.334
CENTROID X	:	.033	-.168	.022
CENTROID Y	:	-.061	-.078	-.101
POA TO CENTROID in.	:	.070	.186	.103
MIN RADIUS	:	.377	.327	.340
MEAN RADIUS	:	.612	.521	.485
MAX RADIUS	:	.807	.745	.612
HORIZONTAL SPREAD	:	1.577	1.192	.923
VERTICAL SPREAD	:	.769	.769	.769
EXTREME SPREAD	:	1.577	1.240	1.067

NUMBER IN ONE INCH CIRCLE = 1
NUMBER IN TWO INCH CIRCLE = 5
NUMBER IN THREE INCH CIRCLE = 5

21 Oct 1988 FILE:/PATTERNING/CENTERFIRE_PATT/B6896103.1.1

CENTERFIRE PATTERNS # 1



\# OF SHOTS= 5

\# IN CIR
1in = 2
2in = 3
3in = 4

HS= 2.636
VS= .899
GS= 2.710

AVG. G.S. = 2.36
A.M.R = .773

B6896103 - (A.C)

M-700 "CLASSIC"
.300 WHBY. MAG,
REM- 190 GR. PSP

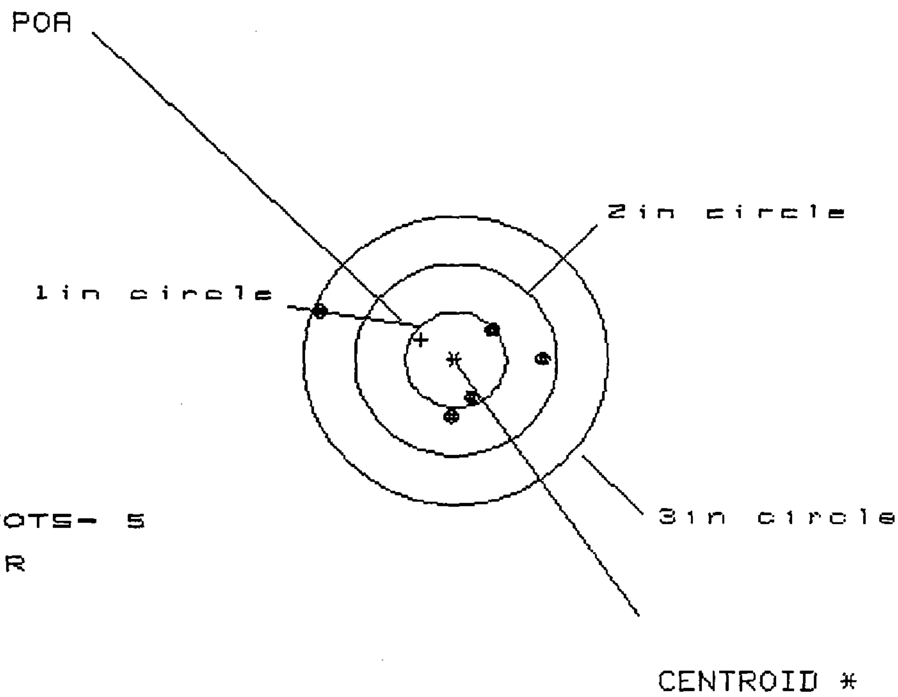
LYMAN ALL-AMERICAN
20X SCOPE.

100 YDS. SAND BAG REST.

PATTERN #	:	1		
SHOTS (BEST OF)	:	5	4	3
MAXIMUM X	:	1.466	.713	.445
MINIMUM X	:	-1.170	-.804	-.475
MAXIMUM Y	:	.507	.347	.349
MINIMUM Y	:	-.392	-.266	-.264
CENTROID X	:	-.046	-.412	-.144
CENTROID Y	:	.015	-.111	-.113
POA TO CENTROID in.	:	.048	.427	.183
MIN RADIUS	:	.398	.224	.266
MEAN RADIUS	:	.830	.555	.438
MAX RADIUS	:	1.551	.804	.566
HORIZONTAL SPREAD	:	2.636	1.517	.920
VERTICAL SPREAD	:	.899	.613	.613
EXTREME SPREAD	:	2.710	1.555	1.017
NUMBER IN ONE INCH CIRCLE	=		2	
NUMBER IN TWO INCH CIRCLE	=		3	
NUMBER IN THREE INCH CIRCLE	=		4	

21 Oct 1988 FILE:/PATTERNING/CENTERFIRE_PATT/86B96103.1.1

CENTERFIRE PATTERNS # 2

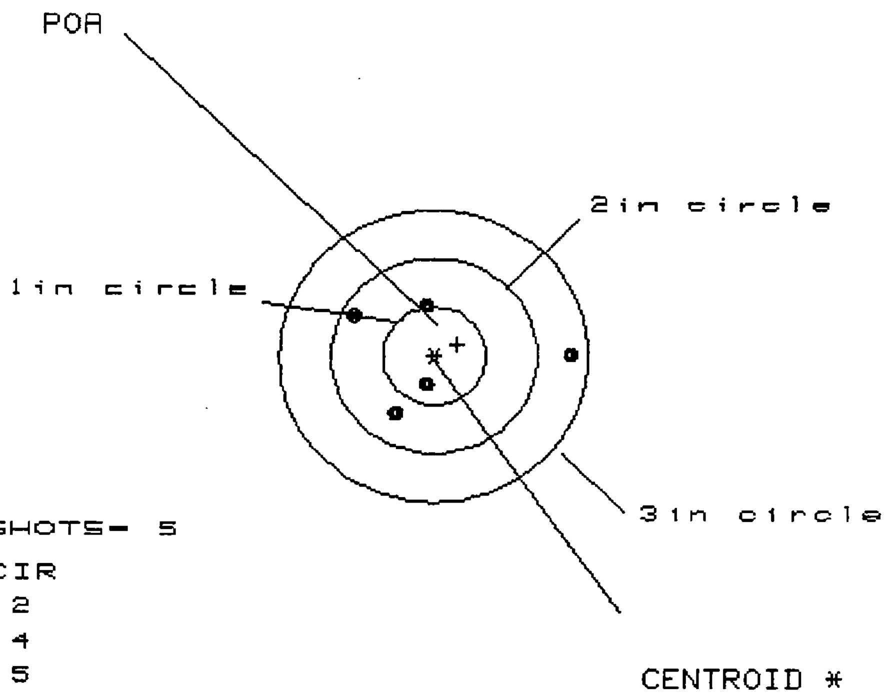


# OF SHOTS= 5
# IN CIR
1in = 2
2in = 4
3in = 5
HS= 2.168
VS= 1.110
GS= 2.232

PATTERN #	:	2		
SHOTS (BEST OF)	:	5	4	3
MAXIMUM X	:	.827	.492	.189
MINIMUM X	:	-1.341	-.351	-.187
MAXIMUM Y	:	.555	.463	.517
MINIMUM Y	:	-.555	-.416	-.362
CENTROID X	:	.342	.677	.513
CENTROID Y	:	-.214	-.353	-.407
POA TO CENTROID in.	:	.403	.764	.655
MIN RADIUS	:	.386	.266	.154
MEAN RADIUS	:	.741	.448	.371
MAX RADIUS	:	1.451	.545	.550
HORIZONTAL SPREAD	:	2.168	.843	.376
VERTICAL SPREAD	:	1.110	.879	.879
EXTREME SPREAD	:	2.232	1.022	.956
NUMBER IN ONE INCH CIRCLE	=		2	
NUMBER IN TWO INCH CIRCLE	=		4	
NUMBER IN THREE INCH CIRCLE	=		5	

21 Oct 1988 FILE:/PATTERNING/CENTERFIRE_PATT/86B96103.1.1

CENTERFIRE PATTERNS # 3



OF SHOTS= 5

# IN CIR
1in = 2
2in = 4
3in = 5

HS= 2.100
VS= 1.092
GS= 2.136

A

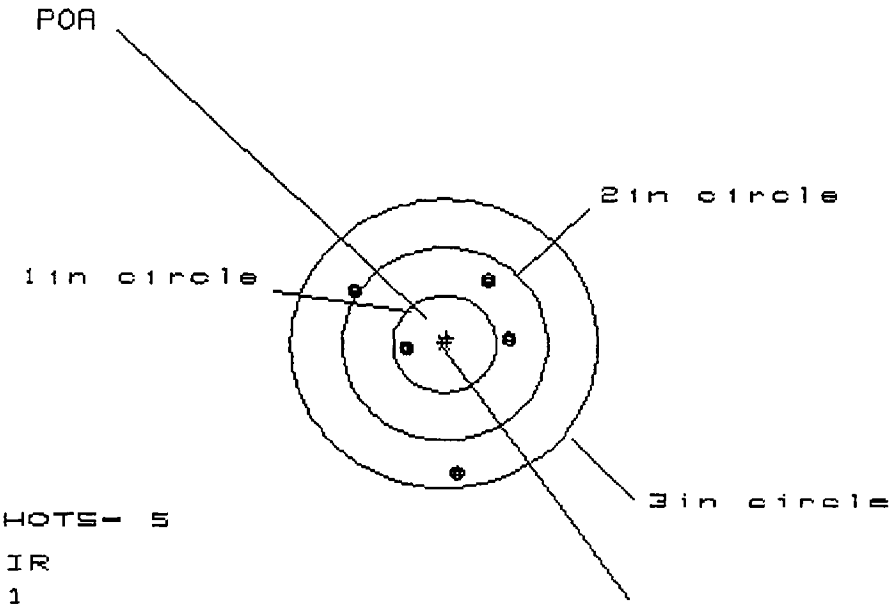
PATTERN # : 3

SHOTS (BEST OF)	:	5	4	3
MAXIMUM X	:	1.322	.271	.122
MINIMUM X	:	-.778	-.448	-.197
MAXIMUM Y	:	.479	.487	.630
MINIMUM Y	:	-.613	-.605	-.462
CENTROID X	:	-.221	-.551	-.402
CENTROID Y	:	-.118	-.126	-.269
POA TO CENTROID in.	:	.251	.566	.484
MIN RADIUS	:	.336	.382	.183
MEAN RADIUS	:	.749	.542	.442
MAX RADIUS	:	1.322	.620	.641
HORIZONTAL SPREAD	:	2.100	.719	.319
VERTICAL SPREAD	:	1.092	1.092	1.092
EXTREME SPREAD	:	2.136	1.138	1.138

NUMBER IN ONE INCH CIRCLE = 2
NUMBER IN TWO INCH CIRCLE = 4
NUMBER IN THREE INCH CIRCLE = 5

21 Oct 1988 FILE:/PATTERNING/CENTERFIRE_PATT/B82432.1

CENTERFIRE PATTERNS # 1



CENTROID *

OF SHOTS= 5

# IN CIR
1in = 1
2in = 4
3in = 5

HS= 1.487
VS= 2.000
GS= 2.077

AVG.G.S. = 2.115
A.V. M.R. = .875

B6896067 (J.E.S)

M-700- CLASSIC.
.300 WRBY MAG.

PATTERN #	:	1		
SHOTS (BEST OF)	:	5	4	3
MAXIMUM X	:	.644	.681	.412
MINIMUM X	:	-.843	-.806	-.614
MAXIMUM Y	:	.710	.388	.459
MINIMUM Y	:	-1.290	-.320	-.249
CENTROID X	:	-.022	-.059	.210
CENTROID Y	:	-.064	.258	.187
POA TO CENTROID in.	:	.068	.265	.281
MIN RADIUS	:	.382	.471	.462
MEAN RADIUS	:	.831	.663	.542
MAX RADIUS	:	1.298	.834	.663
HORIZONTAL SPREAD	:	1.487	1.487	1.026
VERTICAL SPREAD	:	2.000	.708	.708
EXTREME SPREAD	:	2.077	1.567	1.080

NUMBER IN ONE INCH CIRCLE = 1
NUMBER IN TWO INCH CIRCLE = 4
NUMBER IN THREE INCH CIRCLE = 5

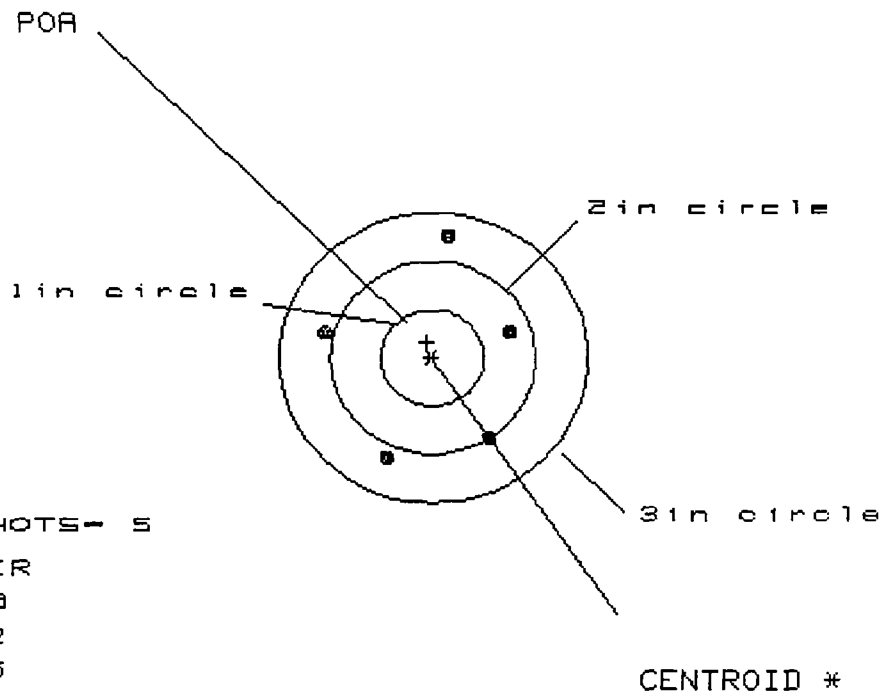
REM- 190 GR. PSP.

LYMAN. ALL AMERICAN
20X SCOPE

100 YDS. SAND BAG. REST.

21 Oct 1988 FILE:/PATTERNING/CENTERFIRE_PATT/B82432.1

CENTERFIRE PATTERNS # 2



OF SHOTS= 5

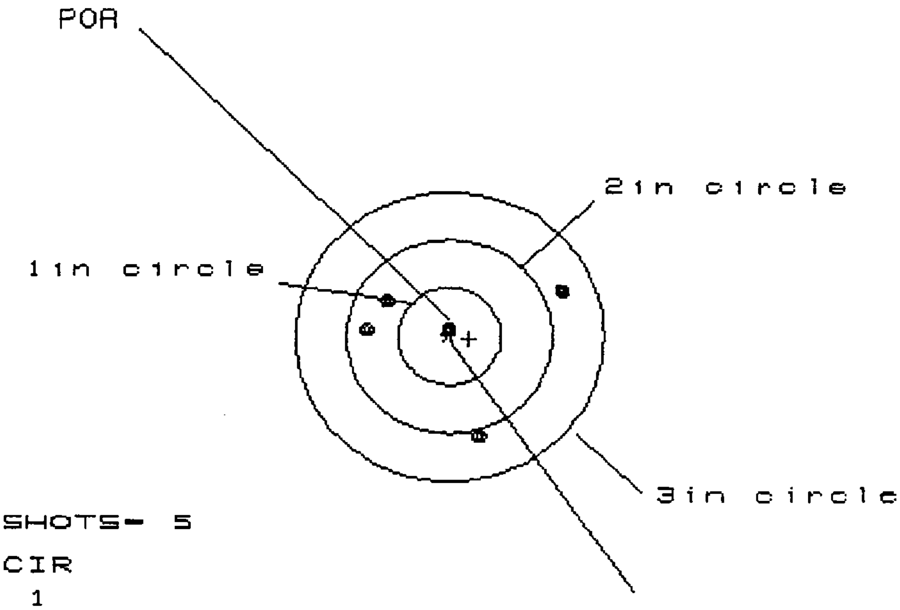
# IN CIR
1in = 0
2in = 2
3in = 5

HS= 1.816
VS= 2.308
GS= 2.380

PATTERN #	:	2		
SHOTS (BEST OF)	:	5	4	3
MAXIMUM X	:	.770	.813	.691
MINIMUM X	:	-1.046	-1.003	-1.125
MAXIMUM Y	:	1.269	.613	.372
MINIMUM Y	:	-1.039	-.722	-.723
CENTROID X	:	-.052	.009	.131
CENTROID Y	:	-.167	-.484	-.244
POA TO CENTROID in.	:	.175	.485	.277
MIN RADIUS	:	.817	.736	.775
MEAN RADIUS	:	1.050	.931	.934
MAX RADIUS	:	1.281	1.175	1.185
HORIZONTAL SPREAD	:	1.816	1.816	1.816
VERTICAL SPREAD	:	2.308	1.334	1.095
EXTREME SPREAD	:	2.380	1.905	1.905
NUMBER IN ONE INCH CIRCLE	=		0	
NUMBER IN TWO INCH CIRCLE	=		2	
NUMBER IN THREE INCH CIRCLE	=		5	

21 Oct 1988 FILE:/PATTERNING/CENTERFIRE_PATT/B82432.1

CENTERFIRE PATTERNS # 3

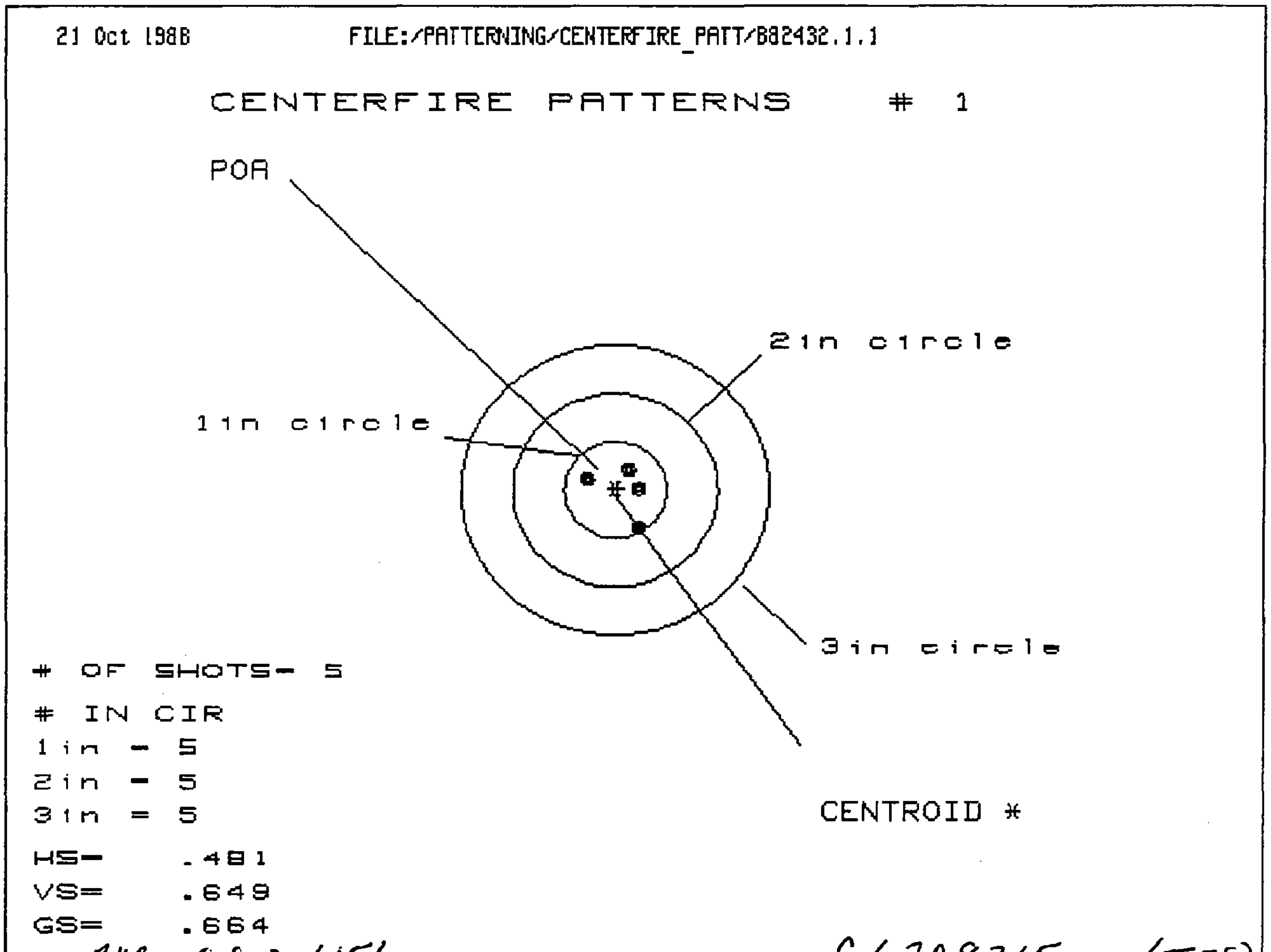


OF SHOTS= 5

# IN CIR
1in = 1
2in = 3
3in = 5

HS= 1.829
VS= 1.502
GS= 1.889

PATTERN #	:	3		
SHOTS (BEST OF)	:	5	4	3
MAXIMUM X	:	1.064	.604	.417
MINIMUM X	:	-.765	-.499	-.298
MAXIMUM Y	:	.512	.511	.223
MINIMUM Y	:	-.990	-.862	-.121
CENTROID X	:	-.193	-.459	-.660
CENTROID Y	:	.026	-.102	.186
POA TO CENTROID in.	:	.195	.470	.686
MIN RADIUS	:	.076	.284	.253
MEAN RADIUS	:	.754	.616	.335
MAX RADIUS	:	1.181	1.053	.429
HORIZONTAL SPREAD	:	1.829	1.103	.715
VERTICAL SPREAD	:	1.502	1.373	.344
EXTREME SPREAD	:	1.889	1.655	.715
NUMBER IN ONE INCH CIRCLE	=		1	
NUMBER IN TWO INCH CIRCLE	=		3	
NUMBER IN THREE INCH CIRCLE	=		5	



AVG. G.S. = 1.156
A.M.R. = .431

C62092I5 (J.E.S.)

M-700 - "CLASSIC"
300. WHBY. MAG.

PATTERN #	:	1		
SHOTS (BEST OF)	:	5	4	3
MAXIMUM X	:	.208	.255	.318
MINIMUM X	:	-.273	-.226	-.163
MAXIMUM Y	:	.259	.161	.045
MINIMUM Y	:	-.390	-.130	-.076
CENTROID X	:	-.027	-.074	-.137
CENTROID Y	:	-.012	.086	.032
POA TO CENTROID in.	:	.029	.113	.141
MIN RADIUS	:	.210	.220	.159
MEAN RADIUS	:	.301	.246	.218
MAX RADIUS	:	.433	.286	.327
HORIZONTAL SPREAD	:	.481	.481	.481
VERTICAL SPREAD	:	.649	.291	.121
EXTREME SPREAD	:	.664	.496	.496

REM.- 190 GR. PSP.

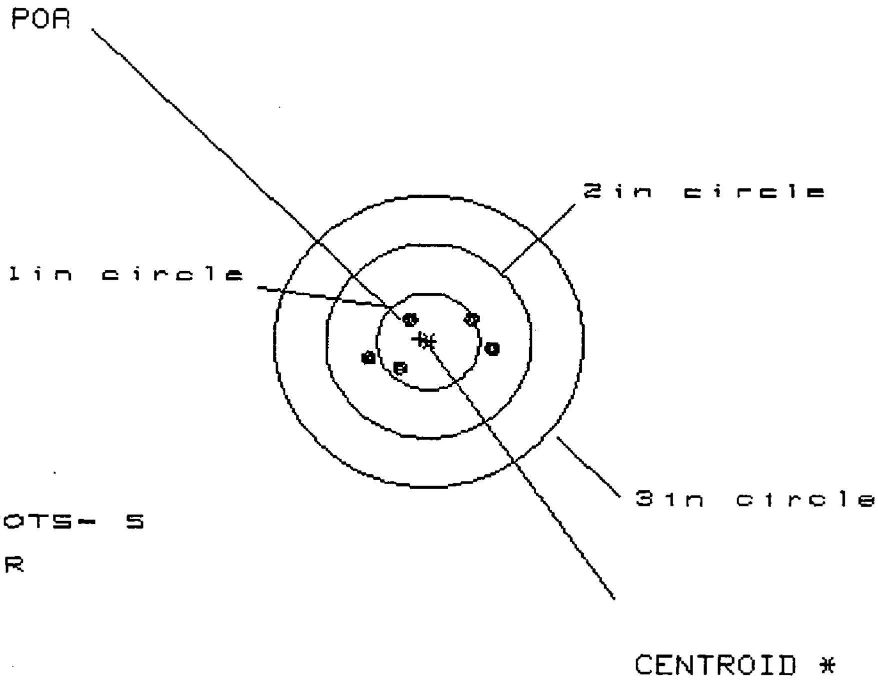
LYMAN- ALL AMERICAN 20X SCOPE.

100 YDS. SAND BAG. REST.

NUMBER IN ONE INCH CIRCLE = 5
NUMBER IN TWO INCH CIRCLE = 5
NUMBER IN THREE INCH CIRCLE = 5

21 Oct 1988 FILE:/PATTERNING/CENTERFIRE_PATT/882432.1.1

CENTERFIRE PATTERNS # 2



OF SHOTS= 5

IN CIR

1in = 3

2in = 5

3in = 5

HS= 1.169

VS= .489

GS= 1.172

PATTERN #	:	2		
SHOTS (BEST OF)	:	5	4	3
MAXIMUM X	:	.591	.588	.444
MINIMUM X	:	-.578	-.430	-.284
MAXIMUM Y	:	.228	.219	.175
MINIMUM Y	:	-.261	-.270	-.314
CENTROID X	:	-.080	-.068	.076
CENTROID Y	:	-.030	-.021	.023
POA TO CENTROID in.	:	.086	.071	.079
MIN RADIUS	:	.282	.219	.238
MEAN RADIUS	:	.467	.397	.375
MAX RADIUS	:	.592	.615	.465
HORIZONTAL SPREAD	:	1.169	1.018	.728
VERTICAL SPREAD	:	.489	.489	.489
EXTREME SPREAD	:	1.172	1.065	.857

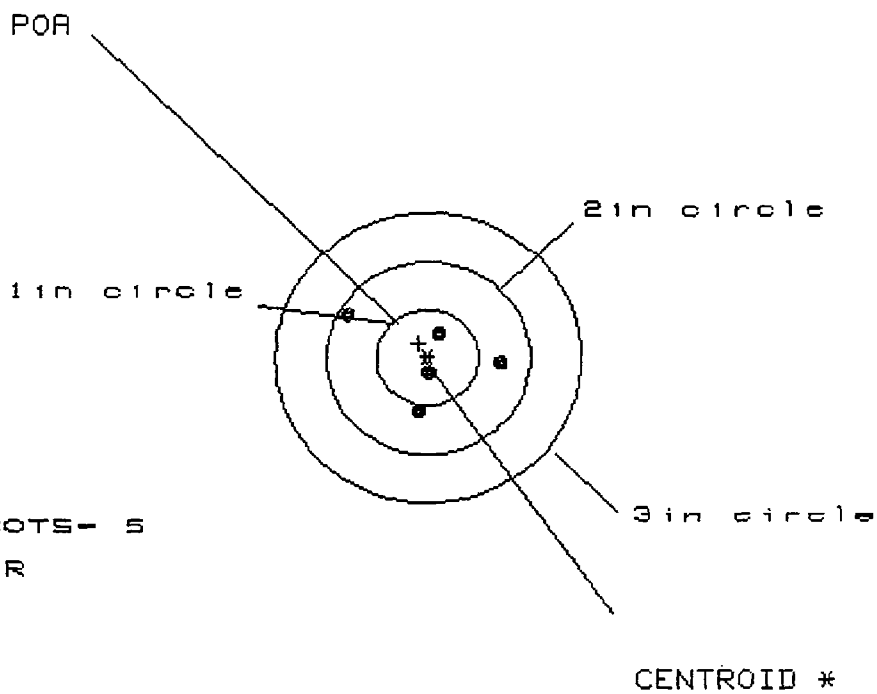
NUMBER IN ONE INCH CIRCLE = 3

NUMBER IN TWO INCH CIRCLE = 5

NUMBER IN THREE INCH CIRCLE = 5

21 Oct 1988 FILE:/PATTERNING/CENTERFIRE_PATT/882432.1.1

CENTERFIRE PATTERNS # 3



OF SHOTS= 5

# IN CIR
1in = 2
2in = 5
3in = 5

HS= 1.573
VS= .916
GS= 1.633

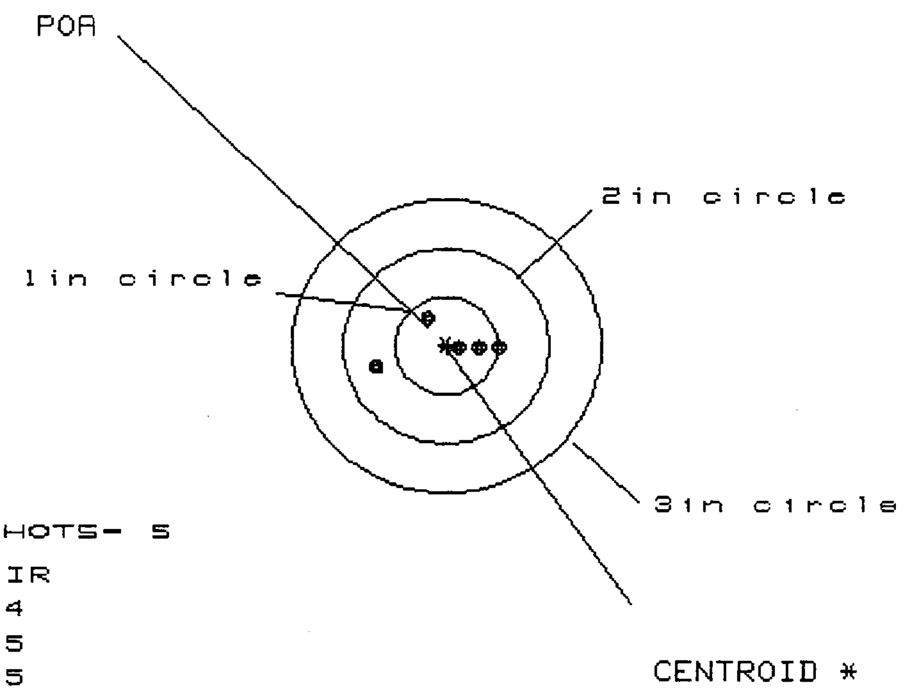
PATTERN # : 3

SHOTS (BEST OF)	:	5	4	3
MAXIMUM X	:	.750	.544	.112
MINIMUM X	:	-.823	-.294	-.112
MAXIMUM Y	:	.404	.378	.400
MINIMUM Y	:	-.512	-.411	-.389
CENTROID X	:	-.088	.294	.112
CENTROID Y	:	-.150	-.251	-.273
POA TO CENTROID in.	:	.174	.386	.295
MIN RADIUS	:	.135	.184	.010
MEAN RADIUS	:	.526	.406	.277
MAX RADIUS	:	.917	.548	.415
HORIZONTAL SPREAD	:	1.573	.838	.224
VERTICAL SPREAD	:	.916	.789	.789
EXTREME SPREAD	:	1.633	.964	.820

NUMBER IN ONE INCH CIRCLE = 2
NUMBER IN TWO INCH CIRCLE = 5
NUMBER IN THREE INCH CIRCLE = 5

21 Oct 1988 FILE:/PATTERNING/CENTERFIRE_PATT/B82432.1.1.1

CENTERFIRE PATTERNS # 1



OF SHOTS= 5

# IN CIR
1in = 4
2in = 5
3in = 5

HS= 1.147
VS= .441
GS= 1.158

AVG. G.S. = 1.454 C 6209210 (J.ES)

A.M.R.= .51

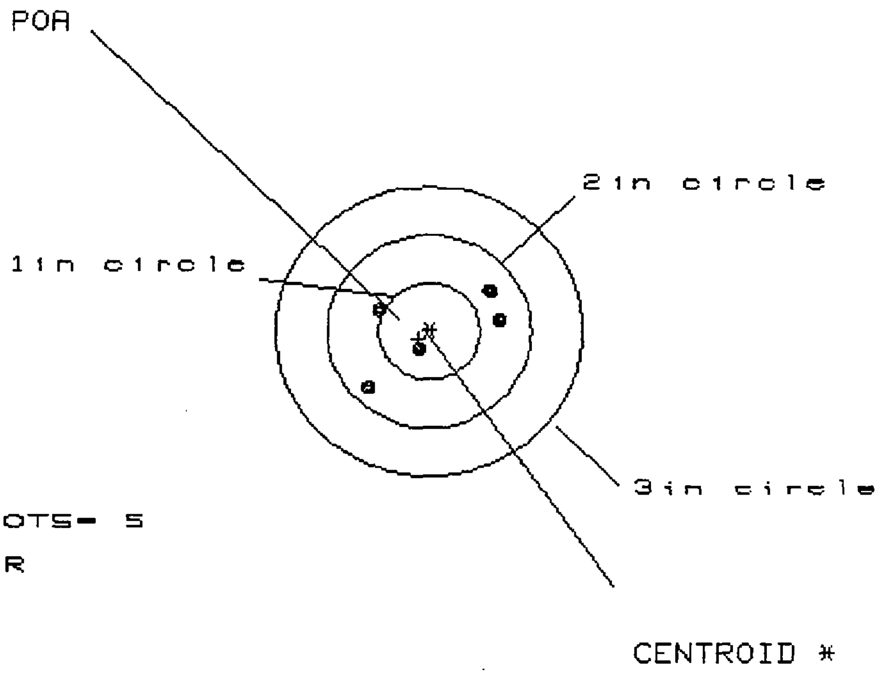
M-700 - CLASSIC
.300 WHBY. MAG.
REM. 180 GR. P.S.P.
LYMAN - ALL AMERICAN 20X SCOPE.
100 YDS. SAND BAG REST.

PATTERN #	:	1		
SHOTS (BEST OF)	:	5	4	3
MAXIMUM X	:	.493	.329	.222
MINIMUM X	:	-.654	-.358	-.248
MAXIMUM Y	:	.257	.211	.187
MINIMUM Y	:	-.184	-.105	-.129
CENTROID X	:	-.016	.148	.038
CENTROID Y	:	.013	.059	.083
POA TO CENTROID in.	:	.020	.159	.091
MIN RADIUS	:	.098	.117	.132
MEAN RADIUS	:	.374	.251	.224
MAX RADIUS	:	.679	.415	.310
HORIZONTAL SPREAD	:	1.147	.687	.470
VERTICAL SPREAD	:	.441	.316	.316
EXTREME SPREAD	:	1.158	.744	.530

NUMBER IN ONE INCH CIRCLE = 4
NUMBER IN TWO INCH CIRCLE = 5
NUMBER IN THREE INCH CIRCLE = 5

21 Oct 1988 FILE:/PATTERNING/CENTERFIRE_PATT/B82432.1.1.1

CENTERFIRE PATTERNS # 2



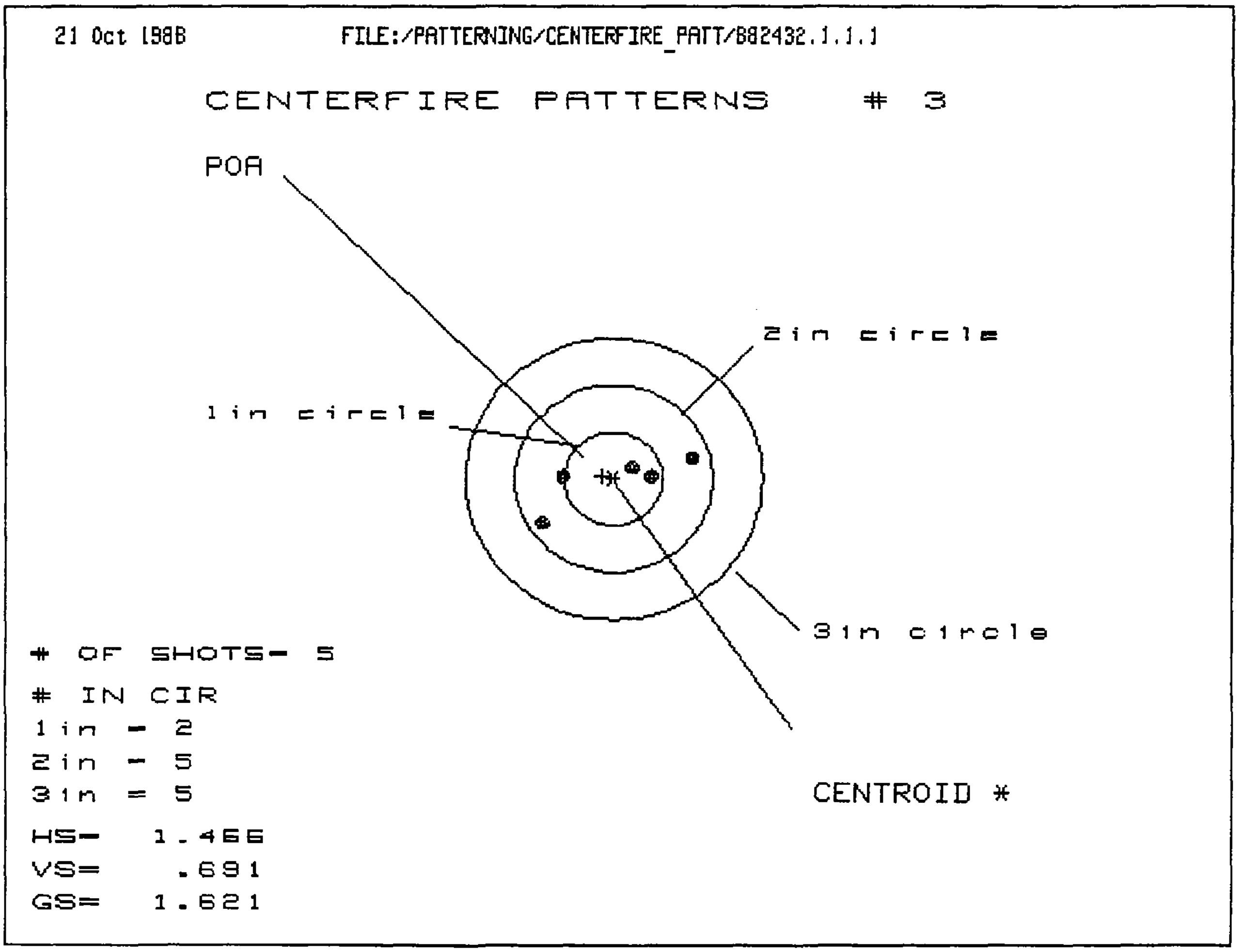
OF SHOTS= 5

IN CIR
1in - 1
2in - 5
3in = 5

HS= 1.254
VS= 1.086
GS= 1.584

PATTERN #	:	2		
SHOTS (BEST OF)	:	5	4	3
MAXIMUM X	:	.664	.517	.655
MINIMUM X	:	-.590	-.673	-.535
MAXIMUM Y	:	.464	.309	.160
MINIMUM Y	:	-.622	-.336	-.233
CENTROID X	:	.104	.251	.113
CENTROID Y	:	.079	.234	.132
POA TO CENTROID in.	:	.130	.344	.173
MIN RADIUS	:	.212	.424	.262
MEAN RADIUS	:	.608	.534	.493
MAX RADIUS	:	.857	.676	.659
HORIZONTAL SPREAD	:	1.254	1.190	1.190
VERTICAL SPREAD	:	1.086	.644	.393
EXTREME SPREAD	:	1.584	1.193	1.193

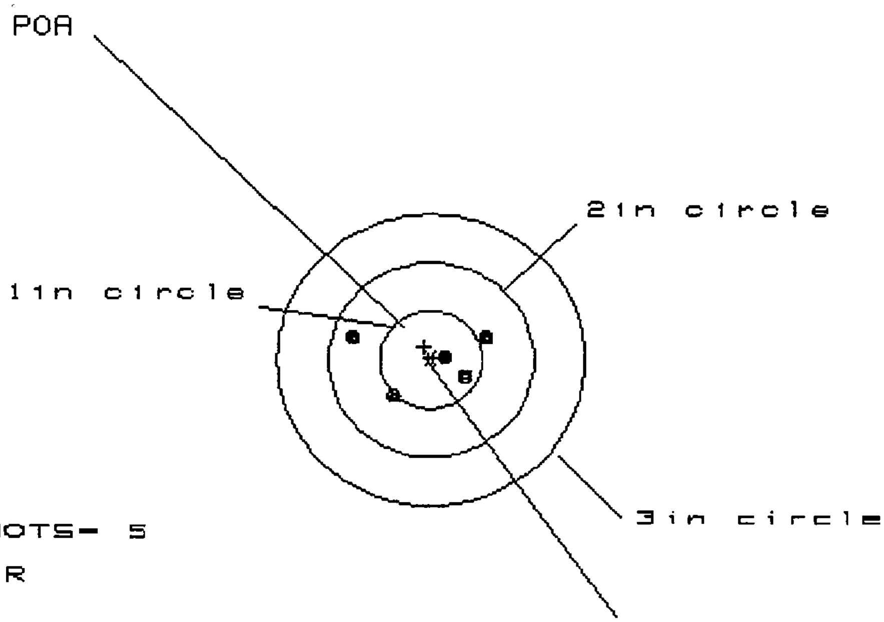
NUMBER IN ONE INCH CIRCLE = 1
NUMBER IN TWO INCH CIRCLE = 5
NUMBER IN THREE INCH CIRCLE = 5



PATTERN #	:	3		
SHOTS (BEST OF)	:	5	4	3
MAXIMUM X	:	.758	.581	.357
MINIMUM X	:	-.708	-.716	-.522
MAXIMUM Y	:	.239	.127	.096
MINIMUM Y	:	-.452	-.114	-.072
CENTROID X	:	.116	.293	.099
CENTROID Y	:	-.029	.083	.041
POA TO CENTROID in.	:	.119	.304	.107
MIN RADIUS	:	.223	.061	.191
MEAN RADIUS	:	.548	.389	.358
MAX RADIUS	:	.840	.725	.527
HORIZONTAL SPREAD	:	1.466	1.297	.879
VERTICAL SPREAD	:	.691	.241	.168
EXTREME SPREAD	:	1.621	1.319	.880
NUMBER IN ONE INCH CIRCLE	=		2	
NUMBER IN TWO INCH CIRCLE	=		5	
NUMBER IN THREE INCH CIRCLE	=		5	

21 Oct 1988 FILE:/PATTERNING/CENTERFIRE_PATT/882432.1.1.1.1

CENTERFIRE PATTERNS # 1



\# OF SHOTS= 5

\# IN CIR

1 in = 3

2 in = 5

3 in = 5

HS= 1.302

VS= .548

GS= 1.302

AVG. G.S = 1.663

A.MR = .591

\# B6896118 (JES)

M-700 - "CLASSIC"

.300 WHBY. MAG.

REM. 190 GR. P.S.P.

LYMAN. ALL AMERICAN

20X SCOPE.

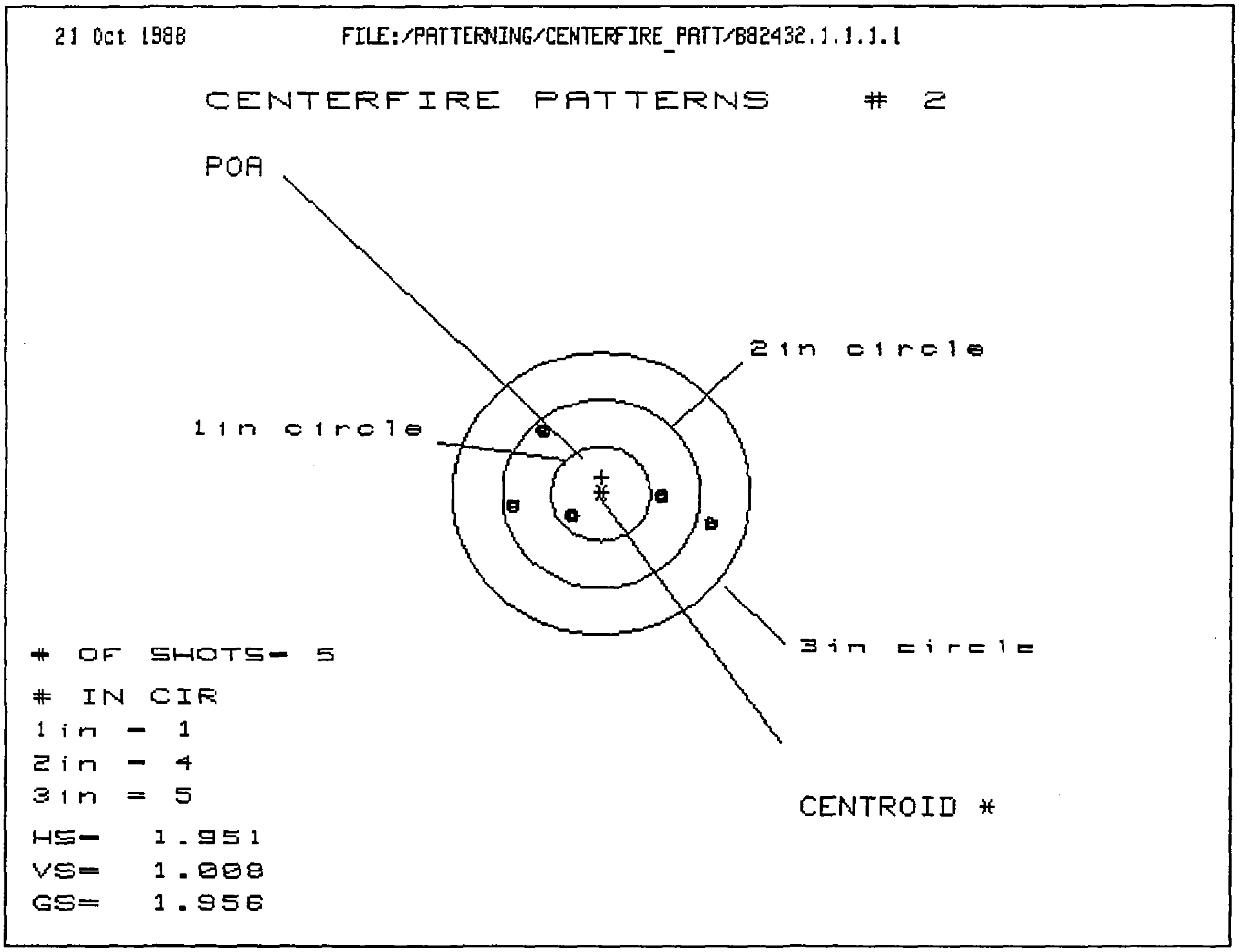
100 YDS. SAND BAG REST

PATTERN #	:	1		
SHOTS (BEST OF)	:	5	4	3
MAXIMUM X	:	.562	.377	.311
MINIMUM X	:	-.740	-.546	-.421
MAXIMUM Y	:	.221	.256	.174
MINIMUM Y	:	-.327	-.272	-.186
CENTROID X	:	-.065	.251	.125
CENTROID Y	:	-.131	-.186	-.272
POA TO CENTROID in.	:	.146	.312	.299
MIN RADIUS	:	.173	.090	.206
MEAN RADIUS	:	.484	.339	.326
MAX RADIUS	:	.773	.610	.460
HORIZONTAL SPREAD	:	1.302	.923	.732
VERTICAL SPREAD	:	.548	.528	.360
EXTREME SPREAD	:	1.302	1.063	.759

NUMBER IN ONE INCH CIRCLE = 3

NUMBER IN TWO INCH CIRCLE = 5

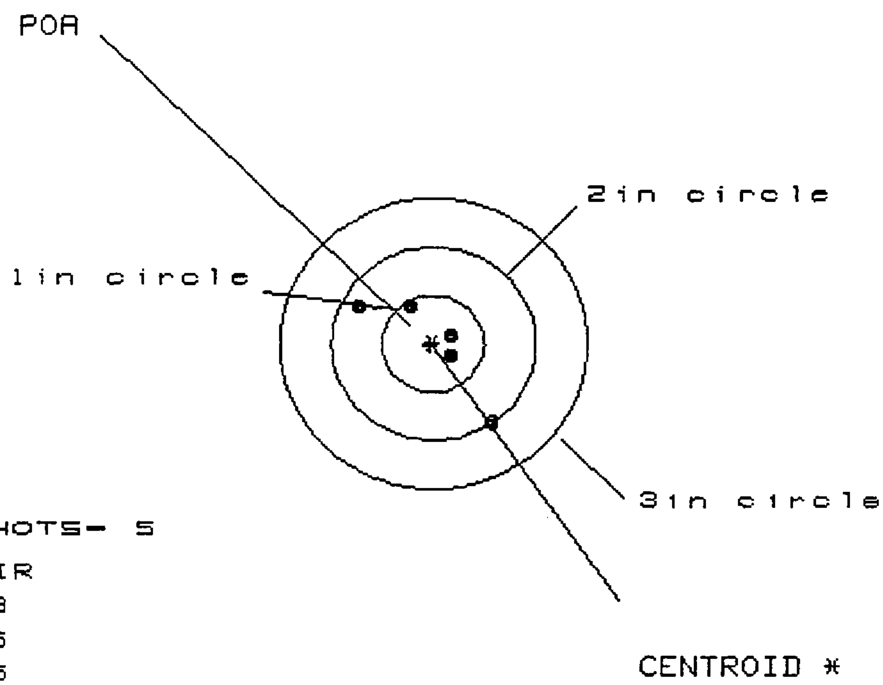
NUMBER IN THREE INCH CIRCLE = 5



PATTERN #	:	2		
SHOTS (BEST OF)	:	5	4	3
MAXIMUM X	:	1.095	.841	.750
MINIMUM X	:	-.856	-.583	-.673
MAXIMUM Y	:	.702	.625	.105
MINIMUM Y	:	-.306	-.283	-.074
CENTROID X	:	-.008	-.281	-.191
CENTROID Y	:	-.176	-.099	-.308
POA TO CENTROID in.	:	.176	.298	.362
MIN RADIUS	:	.332	.283	.107
MEAN RADIUS	:	.759	.610	.513
MAX RADIUS	:	1.137	.847	.757
HORIZONTAL SPREAD	:	1.951	1.423	1.423
VERTICAL SPREAD	:	1.008	.908	.179
EXTREME SPREAD	:	1.956	1.429	1.429
NUMBER IN ONE INCH CIRCLE	=		1	
NUMBER IN TWO INCH CIRCLE	=		4	
NUMBER IN THREE INCH CIRCLE	=		5	

21 Oct 1988 FILE:/PATTERNING/CENTERFIRE_PATT/B82432.1.1.1.1

CENTERFIRE PATTERNS # 3



\# OF SHOTS- 5

\# IN CIR
1in - 3
2in - 5
3in = 5

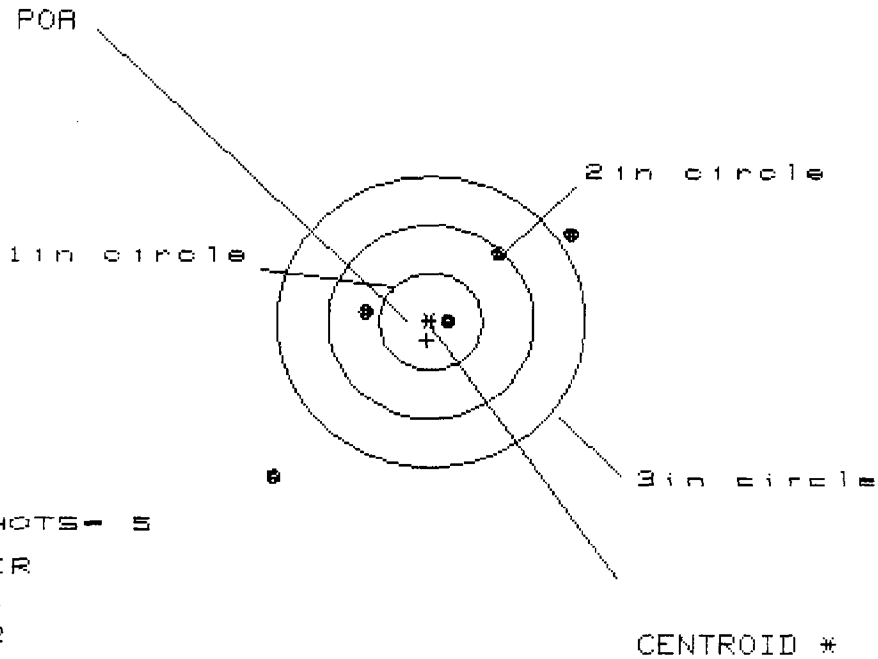
HS- 1.282
VS= 1.204
GS= 1.732

PATTERN #	:	3		
SHOTS (BEST OF)	:	5	4	3
MAXIMUM X	:	.556	.349	.154
MINIMUM X	:	-.726	-.587	-.253
MAXIMUM Y	:	.430	.236	.302
MINIMUM Y	:	-.774	-.283	-.217
CENTROID X	:	-.032	-.107	.088
CENTROID Y	:	.013	.207	.141
POA TO CENTROID in.	:	.034	.233	.166
MIN RADIUS	:	.180	.243	.176
MEAN RADIUS	:	.529	.413	.270
MAX RADIUS	:	.953	.619	.394
HORIZONTAL SPREAD	:	1.282	.936	.407
VERTICAL SPREAD	:	1.204	.519	.519
EXTREME SPREAD	:	1.732	1.004	.628

NUMBER IN ONE INCH CIRCLE = 3
NUMBER IN TWO INCH CIRCLE = 5
NUMBER IN THREE INCH CIRCLE = 5

21 Oct 1988 FILE:/PATTERNING/CENTERFIRE_PATT/B82432.1.1.1.1.1

CENTERFIRE PATTERNS # 1



\# OF SHOTS= 5

\# IN CIR

1 in = 1

2 in = 2

3 in = 3

HS= 2.901

VS= 2.466

GS= 3.807

AVG. G.S. = 2.772

A.M.R. = .962

#23792 (JES)

WEATHERBY - MARK V
300 WHBY. MAG.
REM. 190 GR. PSP

LYMAN 20x SCOPE
ALL-AMERICAN

100 YDS. SAND BAG REST.

PATTERN #	:	1		
SHOTS (BEST OF)	:	5	4	3
MAXIMUM X	:	1.320	.925	.621
MINIMUM X	:	-1.581	-1.039	-.731
MAXIMUM Y	:	.859	.457	.468
MINIMUM Y	:	-1.607	-.436	-.284
CENTROID X	:	.034	.429	.121
CENTROID Y	:	.192	.594	.442
POA TO CENTROID in.	:	.195	.733	.458
MIN RADIUS	:	.200	.445	304
MEAN RADIUS	:	1.137	.762	612
MAX RADIUS	:	2.254	1.093	.778
HORIZONTAL SPREAD	:	2.901	1.964	1.352
VERTICAL SPREAD	:	2.466	.893	.752
EXTREME SPREAD	:	3.807	2.118	1.50[illegible]

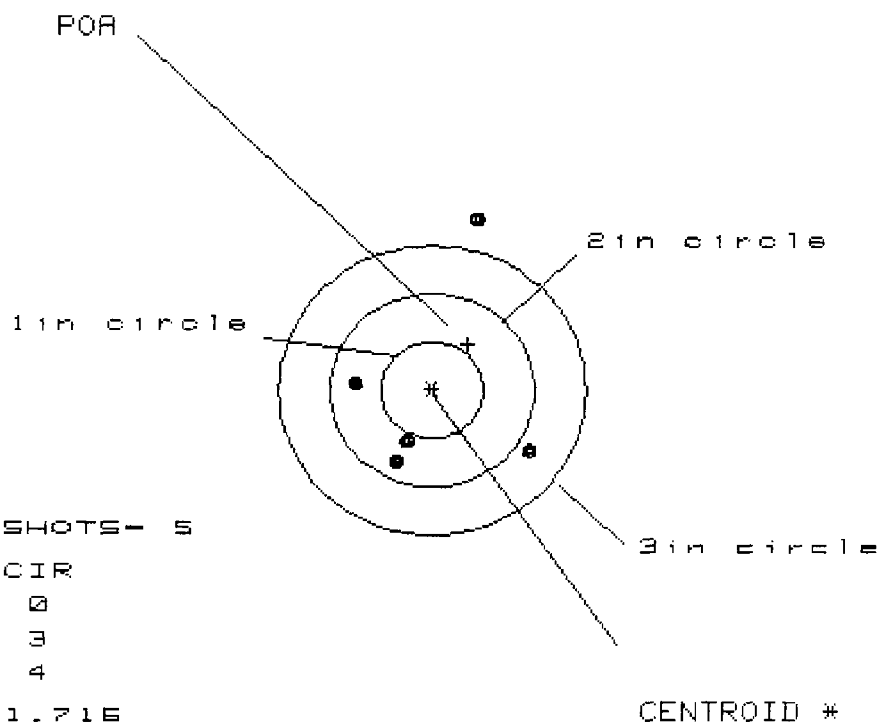
NUMBER IN ONE INCH CIRCLE = 1

NUMBER IN TWO INCH CIRCLE = 2

NUMBER IN THREE INCH CIRCLE = 3

21 Oct 1988 FILE:/PATTERNING/CENTERFIRE_PATT/882432.1.1.1.1.1

CENTERFIRE PATTERNS # 2

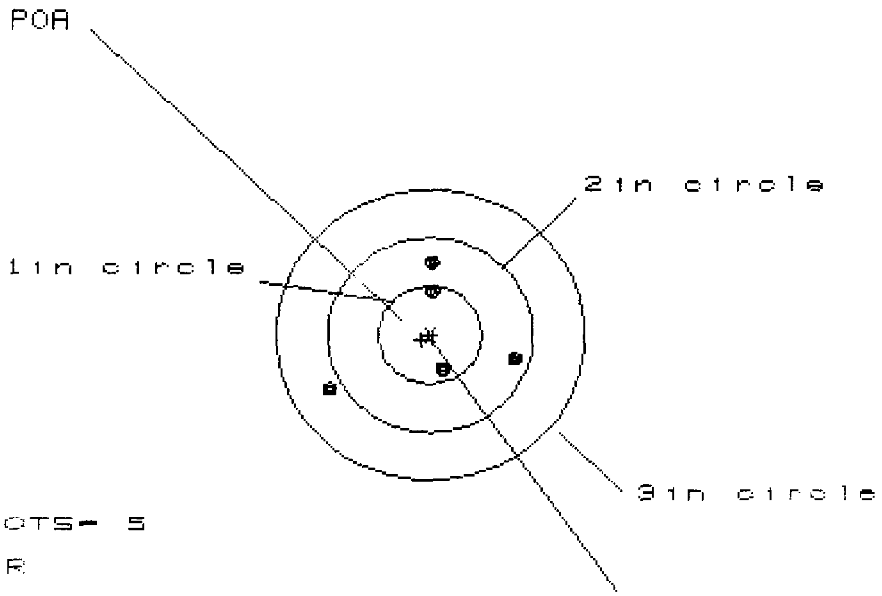


OF SHOTS= 5
IN CIR
1in - 0
2in - 3
3in = 4
HS= 1.716
VS= 2.527
GS= 2.653

PATTERN #	:	2		
SHOTS (BEST OF)	:	5	4	3
MAXIMUM X	:	.961	1.067	.220
MINIMUM X	:	-.755	-.650	-.294
MAXIMUM Y	:	1.815	.492	.449
MINIMUM Y	:	-.712	-.258	-.301
CENTROID X	:	-.349	-.455	-.010
CENTROID Y	:	-.473	-.927	-.884
POA TO CENTROID in.	:	.588	1.032	1.199
MIN RADIUS	:	.608	.171	.265
MEAN RADIUS	:	1.032	.610	.370
MAX RADIUS	:	1.863	1.074	.536
HORIZONTAL SPREAD	:	1.716	1.716	.514
VERTICAL SPREAD	:	2.527	.750	.750
EXTREME SPREAD	:	2.653	1.825	.835
NUMBER IN ONE INCH CIRCLE	=		0	
NUMBER IN TWO INCH CIRCLE	=		3	
NUMBER IN THREE INCH CIRCLE	=		4	

21 Oct 1988 FILE:/PA ..NTERFIRE_PATT/B82432.1.1.1.1.1

CENTERFIRE PATTERNS # 3



OF SHOTS= 5

IN CIR
1 in = 2
2 in = 4
3 in = 5

HS= 1.831
VS= 1.305
GS= 1.856

PATTERN # : 3

SHOTS (BEST OF)	:	5	4	3
MAXIMUM X	:	.825	.574	.109
MINIMUM X	:	-1.006	-.258	-.067
MAXIMUM Y	:	.746	.606	.473
MINIMUM Y	:	-.559	-.494	-.627
CENTROID X	:	.080	.331	.140
CENTROID Y	:	.047	.187	.320
POA TO CENTROID in.	:	.093	.380	.349
MIN RADIUS	:	.393	.385	.167
MEAN RADIUS	:	.716	.559	.426
MAX RADIUS	:	1.151	.698	.636
HORIZONTAL SPREAD	:	1.831	.832	.176
VERTICAL SPREAD	:	1.305	1.100	1.100
EXTREME SPREAD	:	1.856	1.289	1.110

NUMBER IN ONE INCH CIRCLE = 2
NUMBER IN TWO INCH CIRCLE = 4
NUMBER IN THREE INCH CIRCLE 5

Report No. 882442

RESEARCH TEST & MEASUREMENT LAB WORK REQUEST

✓ Developmental
___ Design Acceptance
___ Pre-Pilot
___ Pilot
___ Production Acceptance

AREA OF TESTING

___ Safety Related
___ Competitive Evaluation
___ New Design
___ Design Change
✓ Plant Assistance
___ Litigation
___ Warehouse Audit
___ Cost Reduction
Stake ___
___ Other

FIREARM STAT'S.

MODEL: 700
CAL or GAGE: 458 WIN MAG
BARREL TYPE: ___
PROOFED: YES ___ NO ___

REPORT REQ'D.

FORMAL ___
TEST RESULTS ONLY X

DATE REQUESTED: 8-31-88
DATE NEEDED BY: 9-6-88
REQUESTED BY: Tim McCormack EXT. 288
WORK ORDER NO: 018488

TEST TYPE

✓ Strength Test
___ Function Test
___ Accuracy Test
___ Ammunition Test
___ Environmental Test
___ Customer Complaint
___ Dry Cycle Test
___ Measurements
___ Endurance Test
___ Photo/Video
___ Other ___

EXPLAIN IN DETAIL THE REASON FOR THIS TEST:

Plug BBL and preform a high pressure strength test. BBL has a different contour and has been slotted for a 1/4 rib.

GUNS REQUIRED:

Supplied by custom shop 1 action...

NOTE: NO firearms or parts will be tested in the Labs unless they are accompanied by a Work Request, and both are delivered to the Labs by the designer or engineer. All Work Requests are to be filled out in detail. No Exceptions.

DATE COMPLETED: 9/9/88
TEST COMPLETED BY: DT / RH
REPORT DATE: 9/12/88

TEST AND MEASUREMENT LAB TEST RESULTS

REQUESTER: T. McCormack TESTER: D.T. & R.H. DATE: 9/12/88
REPORT NO.: 882442 WORK ORDER NO.: 018488
WRITTEN BY: D. Thomas
TEST TYPE: Developmental

FIREARM STAT'S : MODEL: 700 with experimental Barrel CAL or GAUGE: .458
BARREL TYPE: ________ PROOFED: YES ___ NO ___

REASON FOR TEST :

To determine if the experimental barrel with a 1/4 inch rib brazed into a slot over the chamber can survive a high pressure strength test.

EQUIPMENT REQUIRED :

1 experimental barrelled action
reloading equipment
Iron Lung
Strain gage equipment

TEST PROCEDURE :

The barrel was plugged with 4 - 510gn, .458 in dia. bullets. A strain gage was applied in the chamber area to determine peak pressure. The gun was then installed in the iron lung and a high pressure round was fired in it. The destructive round consisted of 80gn of Win 296 powder and a 510gn soft point bullet loaded in a win case & primer.

TEST RESULTS :

The barrel burst in the chamber area. The brass color in the cross sectional area of the slot shows that the failure started there.

D. Parker
File

TEST AND MEASUREMENT LAB TEST RESULTS

REQUESTER: D. Parker TESTER: D.T. / J.S. DATE: 10/26/88
REPORT NO.: 883001 WORK ORDER NO.:
WRITTEN BY: D. Thomas
TEST TYPE:

FIREARM STAT'S : MODEL: 700 CAL or GAUGE: 30-06
BARREL TYPE: PROOFED: YES NO ✓

REASON FOR TEST : To determine if the apparent split at the front take down hole in the laminated stock will spread with use.

EQUIPMENT REQUIRED : stereomicroscope
4 - M/700's with laminated stocks (serial #'s C6311744, C6311097, C6311500, C63114
400 rounds of 30-06 ammo (Various types)

TEST PROCEDURE : Two of the stocks were sanded with 600 grit paper in the area of the split. The split disappeared before the finish was sanded through.
The stocks were examined under a microscope and the ends of the splits were marked. The guns were then proofed and reexamined. After proof 100 rounds were shot through each gun and they were again examined to see if the split opened or spread.

TEST RESULTS : In all four stocks the split did not open or spread after proof and 100 rounds.

880051	700	Synthetic Stock Evaluation (3006)
880181	700	Synthetic Stock Evaluation (3006)
880281	700	Rynite Stock with Barrel Pad (270)
880281A	700	same
880611	700	Rynite Stock insert Design Verification
880761	700	Strength .338 cal.
880782	700	Strength Kevlar Stock
881031	700	Accuracy D.C. Brennan vs GFM (3006)
881032	700	Dry cycle Zinc Phos. on Fire Controls
881281	700	No 'V' Rynite Stock Design Verif.
881311	700	Mountain 7M08 T&P
881312	700	Mountain 308 Function & Accuracy
881313	700	Mountain 243 Function & Accuracy

F. H. Smith
File (2)

TEST AND MEASUREMENT LAB TEST RESULTS

REQUESTER: F. H. Smith TESTER: D.T. DATE: 1/7/88
REPORT NO.: 880051 WORK ORDER NO.: 481151
WRITTEN BY: D. Thomas
TEST TYPE: Evaluation

FIREARM STAT'S : MODEL: 700 CAL or GAUGE: 30-06
BARREL TYPE: ______ PROOFED: YES ✓ NO ___

REASON FOR TEST :

Synthetic Stock evaluation
Check recoil Lug for damage or set back

EQUIPMENT REQUIRED :

1 - M/700 with Synthetic Stock
102 rds 30-06 Proof Ammo
Freezer

TEST PROCEDURE :

The stock was examined before & after 100 Proof rounds were fired. Thru the gun.

The gun was Then placed in The freezer aT -40°C overnight. 2 Proof rounds were shoT while The gun was Cold.

TEST RESULTS :

There was no damage to the stock Throughout The test.

Report No. 880051

RESEARCH TEST & MEASUREMENT LAB WORK REQUEST

	AREA OF TESTING	
___ Developmental	___ Safety Related	___ Litigation
✓ Design Acceptance	✓ Competitive Evaluation	___ Warehouse Audit
___ Pre-Pilot	___ New Design	___ Cost Reduction
___ Pilot	___ Design Change	Stake ___
___ Production Acceptance	___ Plant Assistance	___ Other

FIREARM STAT'S.	REPORT REQ'D.	
MODEL: 700	FORMAL ___	DATE REQUESTED: 1-5-88
CAL. or GAGE: 30-06	TEST RESULTS ONLY ✓	DATE NEEDED BY: 1-15-88
BARREL TYPE: BDL		REQUESTED BY: F. H. SMITH
PROOFED: YES ✓ NO ___		WORK ORDER NO: 481151

TEST TYPE

✓ Strength Test	___ Ammunition Test	___ Dry Cycle Test	___ Photo/Video
___ Function Test	___ Environmental Test	___ Measurements	___ Other ___
___ Accuracy Test	___ Customer Complaint	___ Endurance Test	___

EXPLAIN IN DETAIL THE REASON FOR THIS TEST:

SHOOT 100 PROOF RDS.
- CHECK RECOIL LUG FOR DAMAGE OR SET BACK
- SYNTHETIC STOCK EVALUATION

—**GUNS REQUIRED:** M/700 W/SYN. STOCK

NOTE: NO firearms or parts will be tested in the Labs unless they are accompanied by a Work Request, and both are delivered to the Labs by the designer or engineer. All Work Requests are to be filled out in detail. No Exceptions.

DATE COMPLETED: 1/7/88
TEST COMPLETED BY: DJ
REPORT DATE: 1/7/88

RD-69-B

REMINGTON ARMS COMPANY, INC.

INTER-DEPARTMENTAL CORRESPONDENCE

Remington. DUPONT   PETERS DUPONT

"CONFINE YOUR LETTER TO ONE SUBJECT ONLY"

xc: W.H. Coleman, II/File
T.C. Douglas
J.R. Snedeker
H.C. Munson
F.H. Smith
F.L. Supry

RESEARCH TEST AND MEASUREMENT REPORT
REPORT# 880181
MARCH 21, 1988

MODEL 700 SYNTHETIC LONG STOCK EVALUATION

RP# 880181 WO# 481157

MODEL 700 SYNTHETIC LONG STOCK EVALUATION

ABSTRACT:

The Test and Measurement Laboratory evaluated Model 700 long stocks made of Arylon, Rynite, and Fiberglas. The testing consisted of 100 yard accuracy, proof strength and drop testing. The accuracy consisted of three, five shot groups; at ambient, after 24 hours of -40 degrees and after 12 hours of +250 degrees Fahrenheit with each rifle. The proof strength consisted of firing 25 standard factory rounds and 75 high pressure proof rounds with each rifle. The drop test was conducted per SAAMI specifications and then each rifle used was dropped at heights above the SAAMI specifications.

The Arylon and Rynite stocks were as good as or better than the Fiberglas stocks in every phase of the test. The Fiberglas stocks swelled and cracked during the +250 degree Fahrenheit phase of the accuracy test. However, the accuracy results were not adversely affected.

Prepared by: F.L. Supry

Date Prepared: March 21, 1987

RP# 880181 WO# 481157

MODEL 700 SYNTHETIC LONG STOCK EVALUATION

To: F.H. Smith
From: F.L. Supry

INTRODUCTION:

A request was received from F.H. Smith on January 18, 1988 to evaluate Arylon, Rynite and Fiberglas synthetic long stocks assembled on the Model 700 30-06 caliber rifles. The testing consisted of 100 yard accuracy, proof strength and drop testing. The accuracy consisted of three, five shot groups; at ambient, after 24 hours of -40 degrees and after 12 hours of +250 degrees Fahrenheit with each rifle. The proof strength consisted of assembling Model 700 338 Win. Mag. caliber actions into two stocks of each material and firing 25 standard factory rounds and 75 high pressure proof rounds. The drop test was conducted, per SAAMI specifications, on three Arylon, two Rynite and two Fiberglas stocks, assembled with the 30-06 caliber actions and then each was dropped at heights above the SAAMI specifications for additional information.

SCOPE OF TEST:

To determine if the Model 700 rifles assembled in the experimental stocks would meet the Remington specifications for 100 yard accuracy and SAAMI drop testing. Also, to compare the affects of extreme heat and cold on 100 yard accuracy and to compare the strength of the internal bearing surfaces of each stock material.

TEST RESULTS:

There was no deformation of the internal bearing surfaces on any of the stocks tested.

All the rifles tested passed the SAAMI and extended drop test.

The Fiberglas stocks swelled and cracked during the +250 degree Fahrenheit phase of the accuracy test. However, all the rifles tested were within Remington specifications of 3.5 inches for the 100 yard accuracy in each phase of the accuracy test. The following average group sizes were established:

	--------- ACCURACY RESULTS ---------			
STOCK TYPE	AMBIENT (in.)	+250 degrees F.	-40 degrees F. (in.)	(in.)
RYNITE	1.77	2.23	2.00	
Arylon	2.38	2.03	1.98	
FIBERGLAS	1.98	1.83	2.22	

REPORT TEXT:

ACCURACY:

Eleven rifles were shot (two with Rynite stocks, six with Arylon stocks and 3 with Fiberglas stocks) with three, five shot groups fired for each rifle.

Remington 180 grain bronze point ammunition (R30066 code H20 MC2825) was used throughout the test.

The three Fiberglas stocks swelled and cracked during the +250 degree Fahrenheit phase of the accuracy test. The cracks were covered with Duct-tape and the accuracy test continued.

Individual accuracy results are listed in the appendix of this report.

PROOF STRENGTH:

Two stocks of each material were used to test the deformation of internal bearing surfaces, when the rifle was subjected to the loading and firing of 338 Win. Mag. (25 standard and 75 proof rounds) ammunition. There was no deformation on the bearing surfaces of any of the stocks tested.

DROP TEST:

The drop test was conducted, per SAAMI specifications, on three Arylon, two Rynite and two Fiberglas stocks, assembled with the 30-06 caliber actions. Then each was rifle was dropped at heights above the SAAMI specifications for additional information. All the rifles tested passed the SAAMI and extended drop test.

TEST PROCEDURE:

ACCURACY:

The accuracy was shot by D.R. Thomas and J.E. Selan in the R&D 100 yard range located in building 52-1.

Standard long action Leupold bases and Leupold rings were used, in conjunction with a 20X All-American scope.

A total of three, five shot groups, were shot for each rifle. The rifles were cooled and cleaned between each group, and one fouling shot fired before the next group was shot. The procedure was repeated after the rifles were placed in an industrial oven at +250 degrees Fahrenheit

TEST PROCEDURE: (continued)

ACCURACY: (continued)

for 12 hours and then allowed to return to ambient, and again after the rifles were placed in an industrial freezer at -40 degrees Fahrenheit for 24 hours and then allowed to return to ambient.

The targets were analyzed for group size, using the HP 9000 computer and digitizing tablet.

PROOF STRENGTH:

The proof strength test was conducted by C.J. Stephens in the R&D shooting room located in building 52-1A.

Two stocks of each material were randomly selected, the 30-06 actions removed and the internal bearing surfaces examined. Then the 338 Win Mag. actions were assembled to the stocks. Each of the rifles was placed in a shooting jack and 25 standard factory rounds were fired; then, using a lanyard and the portable shield, 75 proof rounds were fired. Next the actions were removed and the internal bearing surfaces re-examined.

DROP TEST:

The drop test was conducted by R.W. Howe and J.E. Selan in the R&D drop test area located in building 52-1A.

The following SAAMI specifications were used:

All drops were on an one inch 85 Durometer Shore A rubber mat backed by concrete.

POSITIONS OF DROP:

1. Vertical - muzzle up
2. Vertical - muzzle down
3. Horizontal - bottom up
4. Horizontal - bottom down
5. Horizontal - left side up
6. Horizontal - right side up

JAR OFF:

SAAMI specification - 12 inch drop in all six positions with the safety in the off position.

HEIGHTS USED: 12, 18, and 24 inches.

TEST PROCEDURE: (continued)

DROP TEST: (continued)

DROP:

SAAMI specification - 48 inch drop in all six positions with safety in the on position.

HEIGHTS USED: 48 and 54 inches.

Three Arylon, two Rynite and two Fiberglas stocks, assembled with the 30-06 caliber actions were used in the drop test. Then, for additional information, each was rifle was dropped at heights above the SAAMI specifications. All the rifles tested passed the SAAMI and extended drop test.

APPENDIX

MODEL 700 SYNTHETIC LONG STOCK EVALUATION
INDIVIDUAL RIFLE ACCURACY RESULTS

SERIAL NUMBER	TYPE OF STOCK	TEMP. (^{O}F)	GROUP 1 (in.)	GROUP 2 (in.)	GROUP 3 (in.)	AVERAGE (in.)
B6893419	F	A	2.477	2.248	1.983	2.236
		+250	1.689	2.037	2.387	2.038
		-40	2.093	1.892	2.147	2.044
B6892908	F	A	1.324	1.814	1.784	1.640
		+250	1.964	1.589	1.981	1.845
		-40	2.541	2.429	2.850	2.607
B6893598	F	A	1.891	1.898	2.438	2.075
		+250	1.805	1.446	1.604	1.618
		-40	1.374	2.391	2.274	2.012
C6203696	R	A	1.092	1.615	1.662	1.456
		+250	2.307	2.624	2.229	2.387
		-40	2.352	1.410	1.184	1.649
B6862427	R	A	1.651	2.358	2.258	2.089
		+250	2.124	2.120	1.968	2.071
		-40	1.557	2.788	2.689	2.345
C6213564	A	A	2.114	1.970	2.659	2.248
		+250	2.294	1.353	2.175	1.941
		-40	0.668	2.766	1.760	1.731
B6887194	A	A	3.079	2.773	3.200	3.017
		+250	1.008	2.342	1.921	1.757
		-40	1.417	2.283	2.147	1.949
C6200125	A	A	2.107	3.778	1.550	2.478
		+250	1.674	1.994	2.003	1.890
		-40	2.165	1.904	2.067	2.045
B6829937	A	A	2.522	3.026	1.115	2.221
		+250	2.672	1.162	1.443	1.259
		-40	2.639	2.472	1.748	2.286
B6835137	A	A	1.995	1.182	1.980	1.719
		+250	3.204	2.704	1.097	2.335
		-40	1.511	1.988	1.982	1.827
B6829419	A	A	2.624	2.350	2.777	2.584
		+250	3.015	1.897	2.561	2.491
		-40	1.345	3.046	1.641	2.011

TEST AND MEASUREMENT LAB - TEST REPORT

REQUESTER: B. BOSQUET TESTER: J. SELAN DATE: 28 JANUARY 1988
REPORT NO.: 880281 WORK ORDER NO.:
WRITTEN BY: F.L. SUPRY

TEST TYPE: **100 YARD ACCURACY**

FIREARM STAT'S: MODEL: 700 CAL OR GAGE: 270 WIN
BARREL TYPE: STD PROOFED: YES

REASON FOR TEST:

To test the accuracy of a Model 700, 270 Win caliber action, in a vendor supplied Rynite stock with barrel pads vs. the same action in a standard Rynite stock.

EQUIPMENT REQUIRED:

100 yard range, 270 Win caliber (130 grain PSP and 150 grain SP) ammunition, standard Rynite stock, Model 700 270 Win caliber action in the vendor stock/pads, digitizing tablet, HP 9000 computer, and personnel.

TEST PROCEDURE:

Three five shot groups were fired with each of the ammo weights, using the Rynite stock with pads. Then, the action was removed and assembled to the standard Rynite stock, and the accuracy tests were repeated. The targets were analyzed using the HP 9000 computer and digitizing tablet, and the results were recorded.

TEST RESULTS:

The 100 yard accuracy results with the action in the Rynite stock with pads, was as good as or better than the accuracy results with the action in the standard Rynite stock. The attached sheet shows the individual group results.

680281

.270 WIN. RYNITE STOCK.. W/ PAD. # B6865734.

130 GR. PSP. E-24LB7325	150 GR. S.P. E-23FB1807.
1 - 1.528	1. 1.456
2 - 1.250	2. 1.112
3 - 1.604	3. 1.555
AVG = 1.460.	AVG = 1.374.

270-WIN. STD. RINITE STOCK. # B 6865734.

130 GR. PSP. E-24LB7325	150 GR. S.P. E-23FB1807.
1. 1.336	1 1.696
2. 1.685	2 1.693
3. 2.270	3 1.991
AVG. = 1.764	AVG = 1.793.

TEST AND MEASUREMENT LAB — TEST REPORT

REQUESTER: B. BOSQUET   TESTER: J. SELAN   DATE: 09 FEBRUARY 1988
REPORT NO.: 880281A   SUPPLEMENT TO 880281   WORK ORDER NO.:
WRITTEN BY: F.L. SUPRY

TEST TYPE: **100 YARD ACCURACY**

FIREARM STAT'S: MODEL: 700   CAL OR GAGE: 270 WIN
BARREL TYPE: STD   PROOFED: YES

REASON FOR TEST:

To test the accuracy of a Model 700, 270 Win caliber action, in a Desert-Camo Rynite stock with barrel pads vs. the test results of same action from test number 880281.

EQUIPMENT REQUIRED:

100 yard range, 270 Win caliber (130 grain PSP and 150 grain SP) ammunition, Desert-Camo Rynite stock/pads, Model 700 270 Win caliber action (#B6865734), digitizing tablet, HP 9000 computer, and personnel.

TEST PROCEDURE:

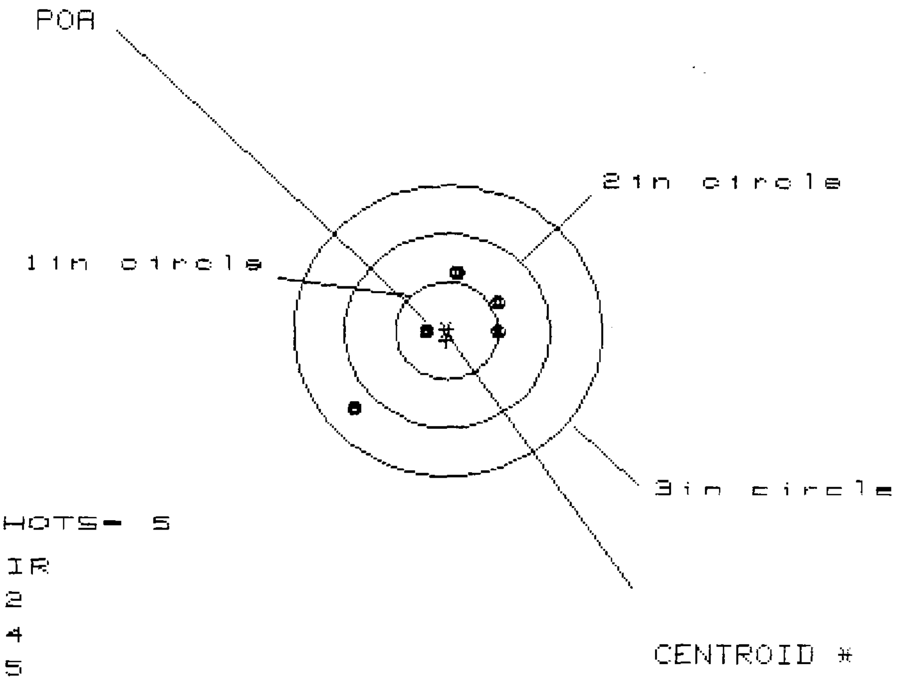
Three five shot groups were fired with each of the ammo weights, using the Desert-Camo Rynite stock with pads. The targets were analyzed using the HP 9000 computer and digitizing tablet, and the results were recorded.

TEST RESULTS:

The 100 yard accuracy results with the action in the Desert-Camo Rynite stock with pads, was comparable to the accuracy results from previous testing. The attached sheet shows the individual group results.

8 Feb 1988 FILE:/PATTERNING/CENTERFIRE_PATT/B802B1

CENTERFIRE PATTERNS # 1



OF SHOTS= 5

# IN CIR
1in = 2
2in = 4
3in = 5

HS= 1.349
VS= 1.393
GS= 1.786
AVG = 1.494

"DESERT CAMO."

B-6865734.

PATTERN #	:	1		
SHOTS (BEST OF)	:	5	4	3
MAXIMUM X	:	.485	.269	.347
MINIMUM X	:	-.864	-.443	-.353
MAXIMUM Y	:	.552	.342	.382
MINIMUM Y	:	-.841	-.258	-.218
CENTROID X	:	.007	.223	.133
CENTROID Y	:	.100	.310	.270
POA TO CENTROID in.	:	.100	.382	.301
ANGLE POA CENTROID	:	85.988	54.270	63.747
MIN RADIUS	:	.232	.294	.382
MEAN RADIUS	:	.613	.372	.393
MAX RADIUS	:	1.206	.513	.415
HORIZONTAL SPREAD	:	1.349	.712	.700
VERTICAL SPREAD	:	1.393	.600	.600
EXTREME SPREAD	:	1.786	.806	.702

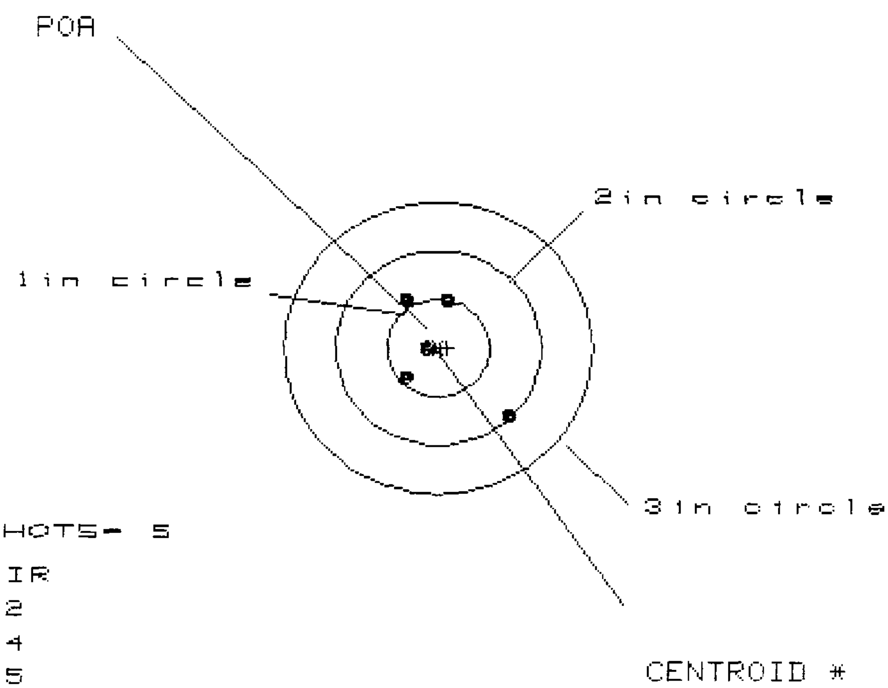
NUMBER IN ONE INCH CIRCLE = 2
NUMBER IN TWO INCH CIRCLE = 4
NUMBER IN THREE INCH CIRCLE = 5

REM. 130 GR.
P.S.P. 270 WIN.
E-24-LB7325

LYMAN - 20X SCOPE
100 YDS. SAND BAG REST.

8 Feb 1988 FILE:/PATTERNING/CENTERFIRE_PATT/B802B1

CENTERFIRE PATTERNS # 2



\# OF SHOTS= 5

\# IN CIR
1in = 2
2in = 4
3in = 5

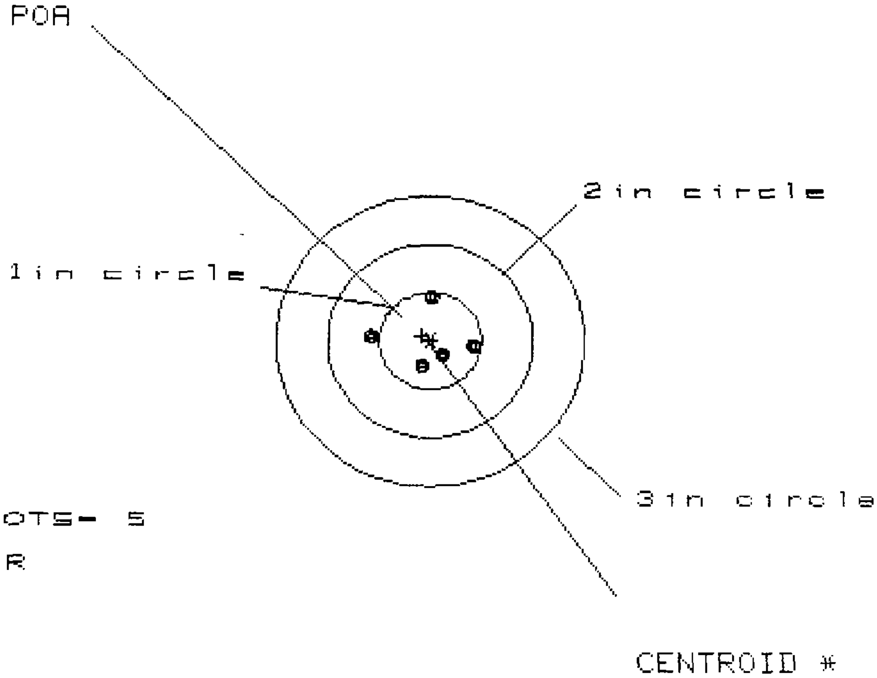
HS= 1.079
VS= 1.240
GS= 1.644

PATTERN #	:	2		
SHOTS (BEST OF)	:	5	4	3
MAXIMUM X	:	.736	.279	.226
MINIMUM X	:	-.343	-.159	-.197
MAXIMUM Y	:	.515	.334	.437
MINIMUM Y	:	-.725	-.525	-.414
CENTROID X	:	-.087	-.271	-.218
CENTROID Y	:	-.003	.179	.067
POA TO CENTROID in.	:	.087	.325	.228
ANGLE POA CENTROID	:	181.839	123.347	107.140
MIN RADIUS	:	.168	.136	.037
MEAN RADIUS	:	.562	.370	.329
MAX RADIUS	:	1.033	.545	.492
HORIZONTAL SPREAD	:	1.079	.438	.423
VERTICAL SPREAD	:	1.240	.859	.851
EXTREME SPREAD	:	1.644	.950	.950

NUMBER IN ONE INCH CIRCLE = 2
NUMBER IN TWO INCH CIRCLE = 4
NUMBER IN THREE INCH CIRCLE = 5

8 Feb 1988 FILE:/PATTERNING/CENTERFIRE_PATT/B802B1

CENTERFIRE PATTERNS # 3



OF SHOTS= 5

IN CIR
1 in = 4
2 in = 5
3 in = 5

HS= 1.051
VS= .617
GS= 1.052

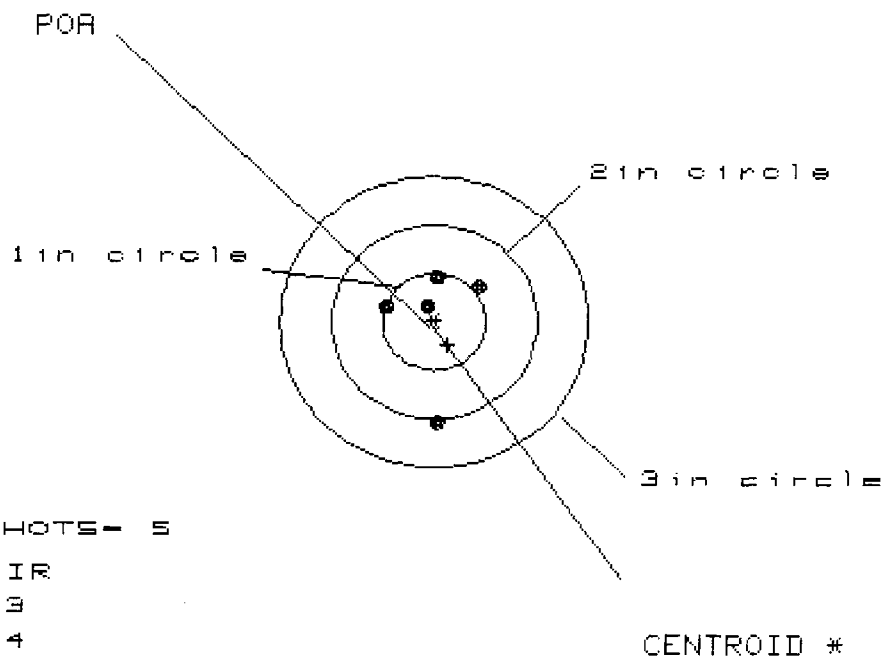
PATTERN # : 3

SHOTS (BEST OF)	:	5	4	3
MAXIMUM X	:	.454	.304	.096
MINIMUM X	:	-.597	-.185	-.083
MAXIMUM Y	:	.400	.407	.402
MINIMUM Y	:	-.217	-.210	-.215
CENTROID X	:	.081	.231	.129
CENTROID Y	:	-.050	-.057	-.052
POA TO CENTROID in.	:	.096	.238	.139
ANGLE POA CENTROID	:	301.560	283.934	291.903
MIN RADIUS	:	.220	.182	.210
MEAN RADIUS	:	.382	.297	.281
MAX RADIUS	:	.598	.423	.402
HORIZONTAL SPREAD	:	1.051	.489	.179
VERTICAL SPREAD	:	.617	.617	.617
EXTREME SPREAD	:	1.052	.621	.621

NUMBER IN ONE INCH CIRCLE = 4
NUMBER IN TWO INCH CIRCLE = 5
NUMBER IN THREE INCH CIRCLE = 5

8 Feb 1988 FILE:/PATTERNING/CENTERFIRE_PATT/880281.1

CENTERFIRE PATTERNS # 1



\# OF SHOTS= 5

\# IN CIR
1in = 3
2in = 4
3in = 5

HS= .904
VS= 1.530
GS= 1.531
AVG = 2.089

"DESERT CAMO"
150GR. S.P. REM.
270 WIN.

\# E23F B1807.

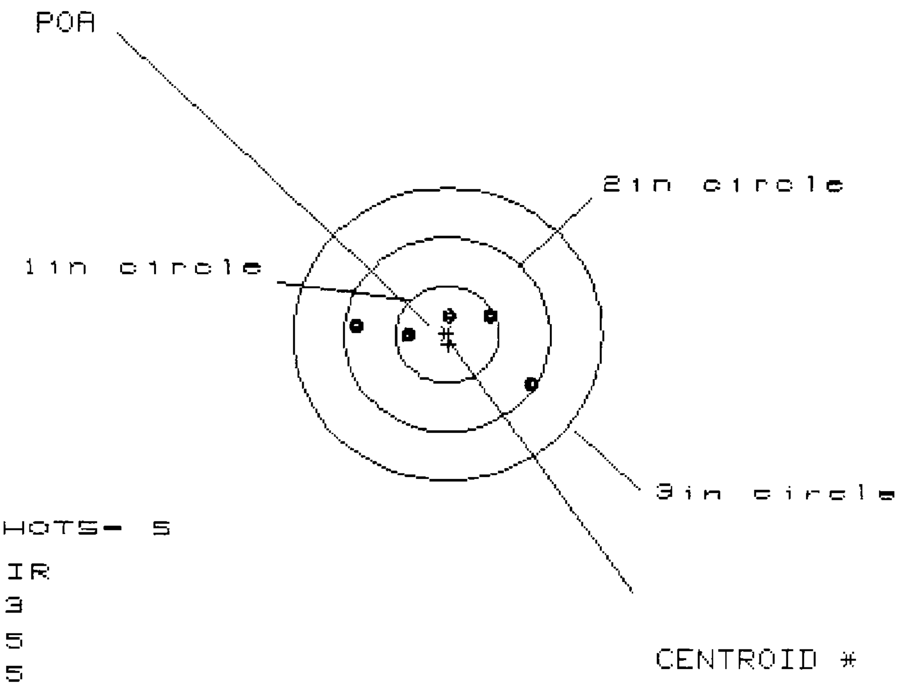
LYMAN. 20X SCOPE
SAND BAG REST.
100 YDS.

PATTERN #	:	1		
SHOTS (BEST OF)	:	5	4	3
MAXIMUM X	:	.455	.471	.182
MINIMUM X	:	-.449	-.433	-.276
MAXIMUM Y	:	.445	.174	.197
MINIMUM Y	:	-1.085	-.146	-.123
CENTROID X	:	-.132	-.148	-.305
CENTROID Y	:	.238	.509	.486
POA TO CENTROID in.	:	.272	.530	.574
ANGLE POA CENTROID	:	150.872	163.780	147.889
MIN RADIUS	:	.191	.115	.120
MEAN RADIUS	:	.551	.306	.230
MAX RADIUS	:	1.086	.476	.302
HORIZONTAL SPREAD	:	.904	.904	.458
VERTICAL SPREAD	:	1.530	.320	.320
EXTREME SPREAD	:	1.531	.929	.559

NUMBER IN ONE INCH CIRCLE = 3
NUMBER IN TWO INCH CIRCLE = 4.
NUMBER IN THREE INCH CIRCLE = 5

8 Feb 1988 FILE:/PATTERNING/CENTERFIRE_PATT/880281.1

CENTERFIRE PATTERNS # 2



\# OF SHOTS= 5

\# IN CIR
1in = 3
2in = 5
3in = 5

HS= 1.708
VS= .645
GS= 1.807

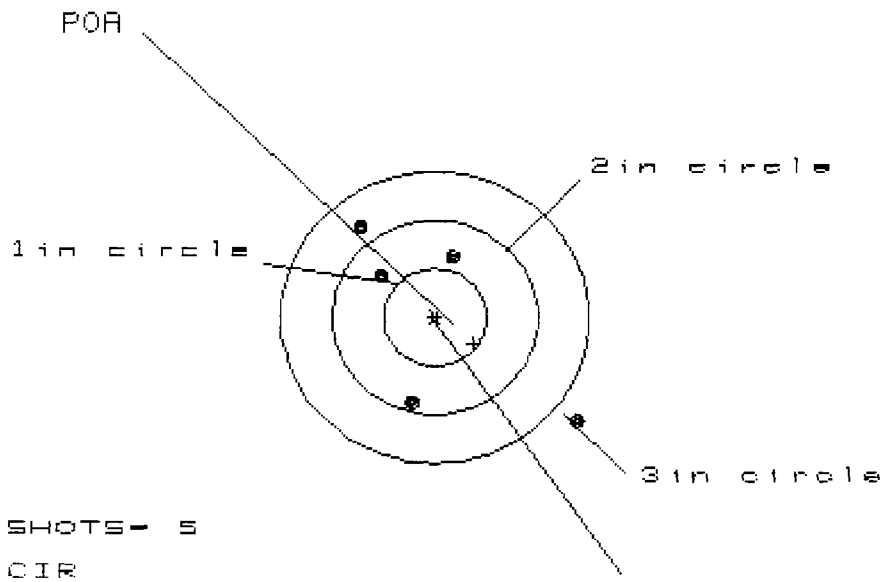
PATTERN # : 2

SHOTS (BEST OF)	:	5	4	3
MAXIMUM X	:	.837	.590	.369
MINIMUM X	:	-.871	-.661	-.405
MAXIMUM Y	:	.169	.050	.049
MINIMUM Y	:	-.476	-.094	-.095
CENTROID X	:	-.017	-.227	-.006
CENTROID Y	:	.102	.221	.222
POA TO CENTROID in.	:	.103	.317	.222
ANGLE POA CENTROID	:	170.319	134.264	178.368
MIN RADIUS	:	.175	.207	.060
MEAN RADIUS	:	.565	.430	.283
MAX RADIUS	:	.963	.661	.416
HORIZONTAL SPREAD	:	1.708	1.251	.774
VERTICAL SPREAD	:	.645	.144	.144
EXTREME SPREAD	:	1.807	1.252	.787

NUMBER IN ONE INCH CIRCLE = 3
NUMBER IN TWO INCH CIRCLE = 5
NUMBER IN THREE INCH CIRCLE = 5

8 Feb 1988 FILE:/PATTERNING/CENTERFIRE_PATT/880281.1

CENTERFIRE PATTERNS # 3



OF SHOTS= 5

IN CIR
1in - 0
2in - 3
3in = 4

HS= 2.113
VS= 2.030
GS= 2.930

CENTROID *

PATTERN #	:	3		
SHOTS (BEST OF)	:	5	4	3
MAXIMUM X	:	1.379	.503	.373
MINIMUM X	:	-.734	-.389	-.353
MAXIMUM Y	:	.917	.639	.577
MINIMUM Y	:	-1.113	-1.120	-.907
CENTROID X	:	-.377	-.722	-.592
CENTROID Y	:	.272	.550	.337
POA TO CENTROID in.	:	.465	.908	.682
ANGLE POA CENTROID	:	125.795	127.312	119.661
MIN RADIUS	:	.661	.252	.483
MEAN RADIUS	:	1.035	.687	.693
MAX RADIUS	:	1.772	1.126	.908
HORIZONTAL SPREAD	:	2.113	.892	.726
VERTICAL SPREAD	:	2.030	1.759	1.484
EXTREME SPREAD	:	2.930	1.828	1.535

NUMBER IN ONE INCH CIRCLE = 0
NUMBER IN TWO INCH CIRCLE = 3
NUMBER IN THREE INCH CIRCLE = 4

RD 89-B

REMINGTON ARMS COMPANY, INC.

INTER-DEPARTMENTAL CORRESPONDENCE

Remington. DU PONT

PETERS DU PONT

"CONFINE YOUR LETTER TO ONE SUBJECT ONLY"

xc: W.H. Coleman, II/File
T.C. Douglas
J.R. Snedeker
H.C. Munson
B.L. Bosquet
F.L. Supry

RESEARCH TEST AND MEASUREMENT REPORT
REPORT# 880611
MARCH 15, 1988

MODEL 700 (RYNITE STOCK INSERT) DESIGN VERIFICATION

RP# 880611 WO# 480257-001800

MODEL 700 (RYNITE STOCK INSERT) DESIGN VERIFICATION

ABSTRACT:

The Test and Measurement Laboratory finds the Design Verification of the Model 700, Rynite stock insert, to be acceptable. The testing consisted of 100 yard accuracy, comparing the results of the actions shot in the experimental Rynite stocks to the results of the same actions shot in a standard wood stock.

Ten rifles were used for the Design Verification test. The accuracy was shot by D.R. Thomas and J.E. Selan. All the rifles tested were within Remington 100 yard accuracy specifications.

Prepared by: F.L. Supry
Date Prepared: March 15, 1987

proofread and cleared by:

H.C. MUNSON, Quality Resource

W.H. COLEMAN, II
New Products Research Lab Director 3/22/88

RP# 880611 WO# 480257-001800

To: H.C. Munson
From: F.L. Supry

INTRODUCTION:

A request was received from B.L. Bosquet on March 01, 1988 to conduct a design verification test on the Model 700 30-06 caliber Rifles assembled in Rynite stocks with experimental barrel alignment inserts. The experimental barrel alignment inserts were attached to the stocks by Remington personnel. If the barrel alignment inserts are successful, Choate will incorporate them in the mold for the Rynite stocks.

SCOPE OF TEST:

To determine if the Model 700 rifles assembled in the experimental stocks would meet the Remington 100 yard accuracy specifications. And, to make a direct comparison of those accuracy results to the results of shooting the same actions assembled in a standard wood stock.

TEST RESULTS:

All the rifles tested were within Remington specifications for 100 yard accuracy. The following average group sizes were established:

STOCK TYPE	REMINGTON SPECIFICATIONS	ACCURACY RESULTS
RYNITE W/INSERTS	3.5 inches	1.941 inches
WOOD	3.5 inches	1.949 inches

REPORT TEXT:

Ten rifles were shot, with three groups shot for each rifle consisting of five shots per group.

Remington 180 grain bronze point ammunition (R30066 code H20 MC2825) was used throughout the test.

Individual accuracy results are listed in the appendix of this report.

TEST PROCEDURE:

The accuracy was shot by D.R. Thomas and J.E. Selan in the R&D 100 yard range, located in building 52-1.

Standard long action Leupold bases and Leupold rings were used, in conjunction with a 20X All-American scope.

A total of three, five shot groups, were shot for each rifle. The rifles were cooled and cleaned between each group, and one fouling shot fired before the next group was shot. After three groups were shot with the rifle in the Rynite stock, the action was removed and reassembled in the wood stock and the accuracy procedure repeated.

The targets were analyzed for group size, using the HP 9000 computer and digitizing tablet.

RP# 880611 WO# 480257-001800

APPENDIX

MODEL 700 (RYNITE STOCK INSERT) DESIGN VERIFICATION

SERIAL NUMBER	TYPE OF STOCK	GROUP 1 (in.)	GROUP 2 (in.)	GROUP 3 (in.)	AVERAGE (in.)
B6889568	R	2.597	1.664	2.003	2.088
	W	2.485	1.346	1.172	1.668
B6889854	R	2.434	1.580	1.458	1.824
	W	2.135	2.902	2.280	2.439
B6889601	R	1.939	2.223	3.141	2.438
	W	2.356	0.898	1.625	1.626
B6887819	R	0.916	1.290	2.536	1.581
	W	1.951	1.606	4.528	2.695
B6889548	R	2.265	2.121	2.108	2.165
	W	1.625	1.473	1.215	1.438
B6889880	R	2.150	1.516	1.924	1.763
	W	2.962	2.004	2.194	2.387
B6889562	R	2.193	2.371	1.929	2.164
	W	1.619	2.212	2.104	1.978
B6889478	R	1.686	3.156	1.839	2.227
	W	2.068	1.590	2.369	2.009
B6889538	R	1.848	1.992	1.567	1.802
	W	1.268	1.850	1.242	1.453
C6204413	R	1.639	1.556	0.885	1.360
	W	1.712	1.939	1.727	1.793
OVERAGE AVERAGE	R	-----	-----	-----	1.941
	W	-----	-----	-----	1.949

Report No. 880761

RESEARCH TEST & MEASUREMENT LAB WORK REQUEST

AREA OF TESTING

____ Developmental	____ Safety Related	____ Litigation
____ Design Acceptance	____ Competitive Evaluation	____ Warehouse Audit
____ Pre-Pilot	____ New Design	____ Cost Reduction
____ Pilot	____ Design Change	Stake ____
✓ Production Acceptance	✓ Plant Assistance	____ Other

FIREARM STAT'S.	REPORT REQ'D.	
MODEL: ____	FORMAL ____	DATE REQUESTED: 3-16-88
CAL. or GAGE: ____	TEST RESULTS ONLY ____	DATE NEEDED BY: 3-19-88
BARREL TYPE: ____		REQUESTED BY: G Barnes/234
PROOFED: YES ____ NO ____		WORK ORDER NO: 019281

TEST TYPE

✓ Strength Test	____ Ammunition Test	____ Dry Cycle Test	____ Photo/Video
____ Function Test	____ Environmental Test	____ Measurements	____ Other ____
____ Accuracy Test	____ Customer Complaint	____ Endurance Test	____

EXPLAIN IN DETAIL THE REASON FOR THIS TEST:

High Pressure Blow up on two 338 Model 700 Rifles.

- Plug barrels ahead of chamber record pressure -

NO ROLLMARKS ON THESE GUNS

—**GUNS REQUIRED:**

NOTE: NO firearms or parts will be tested in the Labs unless they are accompanied by a Work Request, and both are delivered to the Labs by the designer or engineer. All Work Requests are to be filled out in detail. No Exceptions.

DATE COMPLETED: 17 March 88
TEST COMPLETED BY: CS
REPORT DATE: 17 March 88

TEST AND MEASUREMENT LAB TEST RESULTS

REQUESTER: G. Barnes TESTER: C. Stephens DATE: 3/17/88
REPORT NO.: 880761 WORK ORDER NO.: 019281
WRITTEN BY: C. Stephens
TEST TYPE:

FIREARM STAT'S : MODEL: 700 CAL or GAUGE: .338 Win Mag
BARREL TYPE: PROOFED: YES X NO

REASON FOR TEST : Check strength of current production 700 rifles in .338 caliber.

EQUIPMENT REQUIRED : 2 .338 Win Mag rifles. Handloading equipment. Iron lung ,,

TEST PROCEDURE : The high pressure load was determined by using data from previous testing and two high pressure rounds loaded. The two rifles were plugged with 4 200 gr. bullets so that the high pressure round would touch the last bullet. The rifles were placed in the iron lung and shot.

TEST RESULTS :

Results showed that the current production rifles were as good as previous production runs.

REMINGTON ARMS COMPANY, INC.
Ilion Research Division

SUMMARY OF INTENTIONAL GUN ABUSE TEST

DATA

By C. Stephens

Date 17 March 88

FIREARM:

Make Remington Model 700

Grade ______ Gauge .338 Win Mag Serial Number C6243200

Origin ______

Test Number Assigned ______

Comments Barrel plugged with 4 200gr bullets so that live round touches

HISTORY:

Condition New

Previous Rounds Fired –

Headspace at Test –

Test Date 17 March 88

ABUSIVE LOAD USED:

Powder Type 4198

Powder Weight 70

Case Make and Type Win

Total Bullet Weight 200 gr.

Total Shot Weight ______

Estimated Pressure In Excess of 750K

ADDITIONAL COMMENTS: Cracked Stock. Locked up Bolt.

REMINGTON ARMS COMPANY, INC.
Ilion Research Division

SUMMARY OF INTENTIONAL GUN ABUSE TEST

DATA

By C. Stephens

Date 17 March 88

FIREARM:

Make Remington Model 700

Grade ____ Gauge .338 Win Mag Serial Number C6245441

Origin ____

Test Number Assigned ____

Comments Barrel plugged with 4 200gr. bullets so that live round touches.

HISTORY:

Condition New

Previous Rounds Fired –

Headspace at Test –

Test Date 17 March 88

ABUSIVE LOAD USED:

Powder Type 4198

Powder Weight 70gr.

Case Make and Type Win

Total Bullet Weight 200gr.

Total Shot Weight ____

Estimated Pressure In Excess of 750K

ADDITIONAL COMMENTS: Cracked Stock. Locked up Bolt

TEST AND MEASUREMENT LAB TEST RESULTS

4/28/88

REQUESTER: D.C. BRENNAN - MARY SCHRAM TESTER: MAJ BRUCE WINCENTSEN DATE: 4/12/88
REPORT NO.: 88103I WORK ORDER NO.: 48I153
WRITTEN BY: J.SELAN
TEST TYPE: EXPERIMENTAL ACCURACY

FIREARM STAT'S : MODEL: 700 CAL or [redacted]: 30-06
BARREL TYPE: STD. CONTOUR PROOFED: YES ✓ NO ___

REASON FOR TEST : TO DETERMINE ACCURACY OF D.C. BRENNAN PROCESS VS. REMINGTON GFM. BARRELS. (ALL RIFLES SHOT BY D.C. BRENNAN'S SHOOTER, (RET) MAJOR BRUCE WINCENTSEN)

EQUIPMENT REQUIRED : 100 YD. RANGE AND SHOOTING BENCH.

THREE (3) AMMO TYPES: REM. 150 GR. PSP - LOT - C10G D0339
REM. 180 GR. BRZ. PT. LOT - H20MC2B25
FEDERAL - 165 GR. S.P. B.T. LOT IA-7709

2 SCOPES - ONE (1) SUPPLIED BY B. WINCENTSEN 18X LEUPOLD
ONE 1 SUPPLIED BY D.C. BRENNAN - 3.5 X 12 VARIABLE LEUPOLD

10 RIFLES - M-700. 5 CONTROL . 5 ALTERED BY D.C. BRENNAN (SERIAL NO's ON ATTACHED SHEETS)

TEST PROCEDURE :

1.) DISGUISE RIFLES BY PAINTING AND TAPING BBLS. AT JOINT; TAPING FRONT SIGHT HOLES AND SERIAL NUMBERS. AND CODE RIFLES AS TO MASK IDENTITY OF MFG. FROM SHOOTER

2) CLEAN RIFLES BEFORE START OF TEST WITH HOPPE'S SOLVENT, WIRE BRUSH AND PATCH DRY

3) INSTALL SCOPES AND BORE SIGHT.

4) SHOOTER (B. WINCENTSEN) WOULD ZERO RIFLE . SHOOT 3 X 5 SHOT GROUPS. PER AMMO TYPE

5.) COOL AND CLEAN BETWEEN GROUPS.

TEST RESULTS :

150 GR. PSP (REM.) AVG. 5 GROUPS	180 GR. BZ. PT. (REM) AVG. 5 GROUPS	165 GR S.P. B.T. (FEDERAL) AVG. 5 GROUPS
REM. - 1.925	REM. 2.221	REM. - 2.43
DCB. - 2.164	DCB - 1.948	D.C.B. 2.195
AVG. MEAN RADIUS	AVG. MEAN RADIUS	AVG. MEAN RADIUS
REM. - .6712	REM. .7947	REM. - .9289
DCB - .7761	DCB - .699	DCB. - .7675

TARGETS ON FILE WITH WRITER.

TEST AND MEASUREMENT LAB TEST RESULTS

REQUESTER: ________________ TESTER: __________ DATE: __/__/__
REPORT NO.: ______________________ WORK ORDER NO.: __________________
WRITTEN BY: ________________
TEST TYPE: ____

FIREARM STAT'S : MODEL: ____________________ CAL or GAUGE: _____
BARREL TYPE: __________ PROOFED: YES ___ NO ___

REASON FOR TEST :

EQUIPMENT REQUIRED :

ONE (1) H.P. 9000 COMPUTER AND DIGITIZING TABLET.
MISC. CLEANING EQUIPMENT. (CLEANING RODS. HOPPE'S SOLVENT. PATCHES. WIRE BRUSH.)
ONE BORE-SIGHTER (BUSHNELL)

TEST PROCEDURE :

TEST RESULTS :

D.C. BRENNAN VS. REMINGTON - ACCU

SHOOTER: MAJ. (RETIRED) BRUCE WIN

FIRING ORDER	MFG.	RIFLE SERIAL NUMBER			150 GRAIN REMINGTON P.SP. EXTREME SPREAD	MEAN RADIUS
A	R	8481			1.74	.316
F	DCB	7884			2.477	.8336
H	R	8073			2.294	.9323
J	DCB	8873			2.052	.7053
M.	R	8094			1.874	.6943
O	R	8096			2.618	.79
Q	DCB	8860			1.954	.8556
S	DCB	8037			2.335	.834
C	DCB	8547			2.044	.652
D	R.	8889			1.698	.6234
					AVG 5 GROUPS	AVG-M.R.
					R- 1.925	R .6712
					DCB- 2.164	DCB- .776
				DIFFERENCE	.239	.1049

REM. RIFLES

ACCURACY TEST — D.C. BRENNAN

WINCENTSEN.

← 180 GRAIN REMINGTON BR. PT. → EXTREME SPREAD	MEAN RADIUS	← 165 GR. FEDERAL SP. B.T. → EXTREME SPREAD	MEAN RADIUS
2.50	.971	2.381	.94
2.099	.756	2.407	.8546
1.778	.671	2.116	.793
1.429	.4836	2.741	.8913
2.949	.8853	2.242	.7713
2.178	.7636	2.342	.8213
1.913	.6553	1.525	.5923
1.652	.6123	2.22	.7513
2.649	.988	2.086	.748
1.701	.6826	3.072	1.319
AVG. 5 GROUPS	AVG. M.R.	AVG. 5 GROUPS	AVG. M.R.
R- 2.221	R- .7947	R- 2.43	R .9289
DCB- 1.948	DCB- .699	DCB- 2.195	DCB- .7675
.273	.0957	.235	.1614

REM. RIFLES
D.C. BRENNAN

D.C. BRENNAN VS. REMINGTON - ACCURACY TEST

SHOOTER: MAJ. (RETIRED) BRUCE WINCENTSEN.

FIRING ORDER	MFG.	RIFLE SERIAL NUMBER	← 150 GRAIN REMINGTON → P.SP. EXTREME SPREAD	MEAN RADIUS	← 180 GRAIN REMINGTON → BR. PT. EXTREME SPREAD	MEAN RADIUS	← 165 GR. FEDERAL → SP. B.T. EXTREME SPREAD	MEAN RADIUS
A	R	8481	1.74	.316	2.50	.971	2.381	.94
F.	DCB	7884	2.477	.8336	2.099	.756	2.407	.8546
H	R	8073	2.294	.9323	1.778	.671	2.116	.793
J	DCB	8873	2.052	.7053	1.429	.4836	2.741	.8913
M.	R	8094	1.874	.6943	2.949	.8853	2.242	.7713
O	R	8096	2.618	.79	2.178	.7636	2.342	.8213
Q	DCB	8860	1.954	.8556	1.913	.6553	1.525	.5923
S	DCB	8037	2.335	.834	1.652	.6123	2.22	.7513
C	DCB	8547	2.044	.652	2.649	.988	2.086	.748
D	R.	8889	1.698	.6234	1.701	.6826	3.072	1.319
			AVG. 5 GROUPS	AVG. M.R.	AVG. 5 GROUPS	AVG. M.R.	AVG. 5 GROUPS	AVG. M.R.
			R- 1.925	R. .6712	R- 2.221	R. .7947	R- 2.43	R. .9289
			DCB- 2.164	DCB- .7761	DCB- 1.948	DCB- .699	DCB- 2.195	DCB- .7675
		DIFFERENCE	.239	.1049	.273	.0957	.235	.1614

Report No. 881032

RESEARCH TEST & MEASUREMENT LAB WORK REQUEST

	AREA OF TESTING	
X Developmental	___ Safety Related	___ Litigation
___ Design Acceptance	___ Competitive Evaluation	___ Warehouse Audit
___ Pre-Pilot	___ New Design	___ Cost Reduction
___ Pilot	___ Design Change	Stake ___
___ Production Acceptance	___ Plant Assistance	X Other MATERIAL COATING CHANGE

FIREARM STAT'S.	REPORT REQ'D.	
MODEL: 700	FORMAL ___	DATE REQUESTED: 4/12/88
CAL. or GAGE: All		DATE NEEDED BY: 4/20/88
BARREL TYPE: ___	TEST RESULTS ONLY X	REQUESTED BY: JS/283
PROOFED: YES ___ NO ___		WORK ORDER NO: 481011

TEST TYPE

___ Strength Test	___ Ammunition Test	___ Dry Cycle Test	___ Photo/Video
___ Function Test	___ Environmental Test	___ Measurements	X Other DRY CYCLE VISUAL
___ Accuracy Test	___ Customer Complaint	___ Endurance Test	

EXPLAIN IN DETAIL THE REASON FOR THIS TEST:

Dry cycle - 6 Fire controls with zinc phosphate coating to 10,000 cycles
visually inspect -
continue to 20,000 level
and repeat visual inspection

GUNS REQUIRED:

SIX SAMPLES RETURNED TO J. SNEDEKER FOR FURTHER TESTING.

NOTE: NO firearms or parts will be tested in the Labs unless they are accompanied by a Work Request, and both are delivered to the Labs by the designer or engineer. All Work Requests are to be filled out in detail. No Exceptions.

DATE COMPLETED: 4-28-88
TEST COMPLETED BY: R.W. HOWE
REPORT DATE: ___

TEST + MEASUREMENTS LAB
TEST RESULTS
TESTER R. W. HOWE

REQUESTER - J. SNEDEKER

DATE 4-28-88

REPORT # 881032

WORK ORDER NO. 481011

TEST TYPE - DRY CYCLE "DEVELOPMENTAL"

FIRE ARMS STATS. M/700

REASON FOR TEST.

TO CHECK THE FEASABILITY OF USING ZINK PHOSPHATE COATING ON M/700 FIRE CONTROL HOUSINGS.

EQUIPMENT REQUIRED.

SIX M/700 FIRE CONTROLS WITH ZINK PHOSPHATE COATING. TEST LAB M/700 COCK-FIRE AND SAFE LEVER CYCLING DRY CYCLE MACHINE AND TEST LAB M/700 TEST RIFLE.

TEST PROCEDURE.

INDIVIDUAL M/700 FIRE CONTROL ASSEMBLIES NOS. 1 THRO 6 WERE PLACED IN TEST RIFLE IN DRY CYCLE MACHINE AND CYCLED TO A TOTAL OF 20,000 CYCLES EACH OF COCK + FIRE WITH SAFETY LEVER BEING CYCLED "OFF-ON-OFF" ONCE EVERY FIFTEEN CYCLES.

ALL FIRE CONTROLS WERE VISUALY CHECKED AT 10 AND 20,000 CYCLE LEVELS.

TOTAL SAFE "OFF ON OFF" CYCLES = 1,333 FOR 20,000.

TEST RESULTS

SEE ATTACHED SHEET.

TEST RESULTS: REPORT # 88/032

SLIGHT DETERIORATION (WEAR) OF THE ZINK PHOSPHATE COATING OCCURED AT RIGHT SIDE REAR OF FIRE CONTROL SIDE PLATE (AT SAFE ARM CONTACT AREA). NO FIRE CONTROL RELATED MALFUNCTIONS OCCURED IN ANY TEST SAMPLES DURING THE ENTIRE TEST.

TEST SAMPLE	VISUAL OBSERVATION 10,000 CYC.	VISUAL OBSERVATION 20,000 CYC.
# 1	OK	SLIGHT COATING WEAR AT REAR RIGHT PLATE, AT SAFE ARM CONTACT POINT (BRIGHT)
# 2	OK	" " "
# 3	OK	" " "
# 4	BRIGHT SPOT AT REAR RIGHT PLATE AT SAFE ARM CONTACT POINT	MORE BRIGHTNESS (COATING WEAR) ALSO AT LOWER DETENT BALL COUNTER BORE EDGE
# 5	OK	SLIGHT COATING WEAR AT REAR OF RIGHT PLATE. AT SAFE ARM CONTACT AREA (BRIGHT) ALSO AT LOWER DETENT BALL COUNTER BORE EDGE
# 6	OK	" " "

NOTE: BEFORE BEGINNING OF TEST SOME RUST WAS NOTICED AT THE CONTACT AREA BETWEEN THE FRONT SPACER AND TWO SIDE PLATES OF THE HOUSING SUB ASSM.

RD-69-B

REMINGTON ARMS COMPANY, INC.

INTER-DEPARTMENTAL CORRESPONDENCE

Remington. DU PONT   PETERS DU PONT

"CONFINE YOUR LETTER TO ONE SUBJECT ONLY"

xc: W.H. Coleman, II/File
T.C. Douglas
B.L. Bosquet
F.L. Supry
File

RESEARCH TEST AND MEASUREMENT REPORT
REPORT# 881281
MAY 24, 1988

MODEL 700 (NO V-BLOCK RYNITE STOCK INSERT) DESIGN VERIFICATION

RP# 881281 WO# 480257-001800

MODEL 700 (NO V-BLOCK RYNITE STOCK INSERT) DESIGN VERIFICATION

ABSTRACT:

The Test and Measurement Laboratory finds the Design Verification of the Model 700, Rynite stock insert without the V-block, to be acceptable. The testing consisted of 100 yard accuracy, comparing the results of the actions shot in the "No V-block" experimental Rynite stocks to the results of the same actions shot previously in test 880611.

Five rifles were used for the Design Verification test. The accuracy was shot by J.E. Selan in the Research and Development 100 yard range. All the rifles tested were within the Remington 100 yard accuracy specifications.

Prepared by: F.L. Supry
Date Prepared: May 24, 1987

proofread and cleared by:

H.C. MUNSON, Quality Resource — H.C. Munson

W.H. COLEMAN, II
New Products Research Lab Director — W.H. Coleman II

RP# 881281 WO# 480257-001800

To: H.C. Munson
From: F.L. Supry

INTRODUCTION:

A request was received from L.B. Bosquet on May 07, 1988 to conduct a design verification test on the Model 700 30-06 caliber Rifles assembled in Rynite stocks with experimental "No V-block" barrel alignment inserts. The experimental barrel alignment inserts were attached to the stocks by Remington personnel. If the barrel alignment inserts are successful, Choate will incorporate them in the mold for the Rynite stocks instead of the inserts from test 880611.

SCOPE OF TEST:

To determine if the Model 700 rifles assembled in the experimental stocks would meet the Remington 100 yard accuracy specifications. And, to make a direct comparison of those accuracy results to the results of previously shooting the same actions in test 880611.

TEST RESULTS:

All the rifles tested were within Remington specifications for 100 yard accuracy. The following average group sizes were established:

STOCK TYPE	REMINGTON SPECIFICATIONS	ACCURACY RESULTS
RYNITE NO V-BLOCK INSERT	3.5 inches	1.662 inches
RYNITE W/INSERTS (880611)	3.5 inches	1.941 inches
WOOD (880611)	3.5 inches	1.949 inches

RP# 881281 WO# 480257-001800

REPORT TEXT:

Five rifles were shot, with three groups shot for each rifle consisting of five shots per group.

Remington 180 grain bronze point ammunition (R30066 code H20 MC2825) was used throughout the test.

Individual accuracy results are listed in the appendix of this report.

TEST PROCEDURE:

The accuracy was shot by J.E. Selan in the R&D 100 yard range, located in building 52-1.

Standard long action Leupold bases and Leupold rings were used, in conjunction with a 20X All-American scope.

A total of three, five shot groups, were shot for each rifle. The rifles were cooled and cleaned between each group, and one fouling shot fired before the next group was shot.

The targets were analyzed for group size, using the HP 9000 computer and digitizing tablet.

APPENDIX

MODEL 700 (NO V-BLOCK RYNITE STOCK INSERT) DESIGN VERIFICATION

SERIAL NUMBER	TYPE OF STOCK	GROUP 1 (in.)	GROUP 2 (in.)	GROUP 3 (in.)	AVERAGE (in.)
B6889601	NO V	1.198	1.636	1.478	1.437
	R	1.939	2.223	3.141	2.438
	W	2.356	0.898	1.625	1.626
B6887819	NO V	2.253	2.563	2.270	2.362
	R	0.916	1.290	2.536	1.581
	W	1.951	1.606	4.528	2.695
B6889880	NO V	1.114	0.985	0.955	1.018
	R	2.150	1.516	1.924	1.763
	W	2.962	2.004	2.194	2.387
B6889538	NO V	0.986	2.144	1.551	1.563
	R	1.848	1.992	1.567	1.802
	W	1.268	1.850	1.242	1.453
C6204413	NO V	2.645	1.542	1.613	1.933
	R	1.639	1.556	0.885	1.360
	W	1.712	1.939	1.727	1.793
OVERALL AVERAGE:					
	NO V	-----	-----	-----	1.663
	R	-----	-----	-----	1.941
	W	-----	-----	-----	1.949

REMINGTON ARMS COMPANY, INC.

INTER-DEPARTMENTAL CORRESPONDENCE

Remington DUPONT   PETERS DUPONT

"CONFINE YOUR LETTER TO ONE SUBJECT ONLY"

xc: W.H. Coleman, II/File
T.C. Douglas
L.B. Bosquet
F.L. Supry
File

RESEARCH TEST AND MEASUREMENT REPORT

REPORT# 881311
JULY 19, 1988

MODEL 700 MOUNTAIN RIFLE 7MM-08 CALIBER TRIAL AND PILOT EVALUATION

MODEL 700 MOUNTAIN RIFLE 7MM-08 CALIBER TRIAL AND PILOT EVALUATION

ABSTRACT:

Research and Development finds the Trial and Pilot Evaluation of the 7MM-08 caliber, Model 700 Mountain Rifles to be acceptable. The Trial and Pilot Evaluation consisted of Visual Inspection, Field Function and Accuracy. The 10 rifle sample, randomly selected from a 40 rifle sample, was found to be within Remington specifications for each phase of the Trial and Pilot Evaluation.

Prepared by: F.L. Supry
Date Prepared: July 19, 1988

proofread and cleared by:

H.C. MUNSON, Quality Resource — HC Munson

W.H. COLEMAN, II
New Products Research Lab Director — Wm H Coleman III

MODEL 700 MOUNTAIN RIFLE 7MM-08 CALIBER TRIAL AND PILOT EVALUATION

TO: H.C. Munson
FROM: F.L. Supry

INTRODUCTION:

In May, 1988, a request to conduct a Trial and Pilot Evaluation of the 7MM-08 caliber, Model 700 Mountain Rifles was received by the Test Lab. The evaluation used 10 rifles, randomly selected from a production rifle sample and consisted of Visual Inspection, Accuracy and Field Function. The short caliber introduction will also include 243 and 308 caliber rifles. These additional calibers will tested for function and accuracy as they become available.

SCOPE OF THE TEST:

To determine if the production run sample would meet the Remington Specifications set by the Research Design Section.

TEST RESULTS:

The production sample of the 7MM-08 caliber, Model 700 Mountain Rifles was found to be acceptable in all phases of the Trial and Pilot Evaluation. The results of each phase of testing were as follows:

VISUAL:

The overall appearance of the rifles was good.

ACCURACY:

The average group size was 2.18 inches.

FIELD FUNCTION:

Four of the five rifles tested experienced no malfunctions.

One rifle had one Don't Extract malfunction.

REPORT TEXT:

GENERAL:

The following ten rifles were randomly selected from the production sample for the Trial and Pilot Evaluation:

B6897015	B6897053	B6898043	B6897048	B6898064
B6897128	B6898055	B6897064	B6897073	B6897107

VISUAL INSPECTION:

The visual inspection committee finds the overall visual appearance of the Trial and Pilot sample to be acceptable.

All ten of the rifles were used in the Visual Inspection.

Comments on each rifle are located in the appendix.

FIELD FUNCTION:

Five of the rifles were fired 20 rounds each in a field function test conducted at the Ilion Fish and Game Club and the following results were established:

Four of the rifles experienced no malfunctions.

Rifle B6897053 had one don't extract malfunction.

The following five rifles were used in the field function test:

B6897015 B6897053 B6898043 B6897048 B6898064

ACCURACY:

The results showed that the 7MM-08 caliber, Model 700 Mountain Rifles tested met the Remington specification (2.7 inches) for group size.

The following five rifles were used in the accuracy test:

B6897015 B6897053 B6898043 B6897048 B6898064

The average group size for the five rifles used in the accuracy test was 2.18 inches.

Accuracy results per individual rifle are located in the appendix of this report.

TEST PROCEDURE:

VISUAL INSPECTION:

The visual inspection committee consisted of L.B. Bosquet, C.J. Stephens, F.L. Supry, and D.R. Thomas.

All ten rifles were examined.

Each rifle was wiped down with a clean white Coyne towel and examined by each committee member. All comments were recorded.

FIELD FUNCTION:

Five of the ten rifles were subjected to the loading and firing of 20 rounds 140 grain pointed soft point Remington 7MM-08 caliber ammunition in a field function test conducted at the Ilion Fish and Game Club. A round robin method of shooting, alternating shooters every five rounds, was used throughout the field function testing.

ACCURACY:

Three, five shot groups were shot with each of the five rifles selected for 100 yard accuracy. The accuracy was shot by C.J. Stephens in the Research and Development 100 yard range located in building 52-1A.

Remington ammunition code (R02 0D0963) R7M081 (140 grain PSP) was used for the accuracy testing.

Standard short action Leupold bases and rings were used in conjunction with a 12X Redfield scope.

The targets were analyzed for group size using the HP 9000 computer and digitizing tablet.

MODEL 700 MOUNTAIN RIFLE 7MM-08 CALIBER TRIAL AND PILOT EVALUATION

APPENDIX

MODEL 700 MOUNTAIN RIFLE 7MM-08 CALIBER TRIAL AND PILOT EVALUATION

VISUAL INSPECTION:

GENERAL COMMENTS:

The appearance of the 7MM-08 caliber, Model 700 Mountain Rifle sample was good.

There were no visual defects severe enough to reject the sample however, the following items were noted in the visual inspection:

COMMENTS PER INDIVIDUAL RIFLE:

B6898064	POOR BBL POLISH IN THE CHAMBER AREA
B6897107	LOOSE FORE-END CAP
B6897015	GOOD LOOKING RIFLE
B6897073	BRIGHT MAR ON THE FLOOR PLATE RELEASE PIN
B6898043	POOR BBL POLISH IN THE CHAMBER AREA
B6897064	POOR BBL POLISH IN THE CHAMBER AREA
B6898055	DIRTY (MOLYKOTE ON THE FINISH)
B6897048	GOOD LOOKING RIFLE
B6897053	GOOD LOOKING RIFLE
B6897128	FINISH BUBBLES IN THE RIGHT SIDE OF THE STOCK NEAR THE RAIL

MODEL 700 MOUNTAIN RIFLE 7MM-08 CALIBER TRIAL AND PILOT EVALUATION

100 YARD ACCURACY RESULTS

SERIAL NUMBER	GROUP 1 (in.)	GROUP 2 (in.)	GROUP 3 (in.)	AVERAGE (in.)
B6897015	2.30	3.29	1.91	2.50
B6897053	1.59	2.25	3.50	2.45
B6898043	1.93	1.31	1.42	1.55
B6897048	1.80	2.61	2.53	2.31
B6898064	2.16	1.30	2.82	2.09

RD-69-B

REMINGTON ARMS COMPANY, INC.

INTER-DEPARTMENTAL CORRESPONDENCE

Remington. PETERS

"CONFINE YOUR LETTER TO ONE SUBJECT ONLY"

xc: W.H. Coleman, II/File
T.C. Douglas
L.B. Bosquet
F.L. Supry
File

RESEARCH TEST AND MEASUREMENT REPORT

REPORT# 881312
JULY 21, 1988

MODEL 700 MOUNTAIN RIFLE
308 CALIBER FUNCTION AND ACCURACY VERIFICATION

MODEL 700 MOUNTAIN RIFLE
308 CALIBER FUNCTION AND ACCURACY VERIFICATION

ABSTRACT:

The Trial and Pilot Evaluation of the Model 700 Mountain Rifle, in the short caliber action, was completed and accepted using the 7MM-08 caliber rifles as the test vehicle. The introduction of the short caliber action also includes the 308 and 243 calibers. As these calibers become available the function and accuracy will be verified by the Research Test and Measurement Laboratory.

The 308 caliber Model 700 Mountain Rifles tested met Remington specifications (3.5 inches) for group size. The five rifles tested shot an average group size of 2.5 inches. There were no malfunctions during the function test.

Prepared by: F.L. Supry
Date: July 21, 1988

MODEL 700 MOUNTAIN RIFLE
308 CALIBER FUNCTION AND ACCURACY VERIFICATION

TO: H.C. Munson
FROM: F.L. Supry

INTRODUCTION:

In May, 1988, a request to conduct a Function and Accuracy evaluation of the 308 caliber, Model 700 Mountain Rifles was received by the Test Lab. The evaluation used five rifles selected from a production rifle sample in the Ilion warehouse.

SCOPE OF THE TEST:

To determine if the production run samples would meet Remington Specifications set by the Research Design Section.

TEST RESULTS:

The production sample of the 308 caliber, Model 700 Mountain Rifles, was found to be acceptable. The results of the testing were as follows:

ACCURACY:

The average group size was 2.5 inches.

FUNCTION:

There were no malfunctions on any of the five rifles tested.

MODEL 700 MOUNTAIN RIFLE
308 CALIBER FUNCTION AND ACCURACY VERIFICATION

REPORT TEXT:

GENERAL:

The following five rifles were used throughout the accuracy and function test.

C6227982 C6228937 C6237401 C6226948 C6237381

ACCURACY:

The results showed that the 308 caliber, Model 700 Mountain Rifles tested met the Remington specification (3.5 inches) for group size.

All five of the rifles were used for the 100 yard accuracy testing and the following results were obtained:

100 YARD ACCURACY RESULTS

SERIAL NUMBER	GROUP 1 (in.)	GROUP 2 (in.)	GROUP 3 (in.)	AVERAGE (in.)
C6227982	1.90	1.97	2.30	2.06
C6228937	2.25	3.87	3.04	3.05
C6237381	3.21	2.58	2.74	2.84
C6237401	1.40	2.58	3.19	2.39
C6226948	1.75	1.96	2.34	2.02

FUNCTION:

All five rifles were fired 20 rounds each in a function test conducted in the R&D 200 yard range.

No malfunctions occurred.

MODEL 700 MOUNTAIN RIFLE
308 CALIBER FUNCTION AND ACCURACY VERIFICATION

TEST PROCEDURE:

ACCURACY:

Three, five shot groups were shot with each of the five rifles selected for 100 yard accuracy. The accuracy was shot by C.J. Stephens and D.R. Thomas in the Research and Development 100 yard range located in building 52-1A.

Remington ammunition code (C13 TC6305) R308W3 (180 grain PSP) was used for the accuracy testing.

Standard short action Leupold bases and rings were used in conjunction with a 12X Redfield scope.

The targets were analyzed for group size using the HP 9000 computer and digitizing tablet.

FUNCTION:

All five of the rifles were subjected to the loading and firing of 20 rounds 180 grain pointed soft point Remington 308 caliber ammunition in a function test conducted at the R&D 200 yard range.

RD-69-B

REMINGTON ARMS COMPANY, INC.

INTER-DEPARTMENTAL CORRESPONDENCE

Remington. DU PONT PETERS DU PONT

"CONFINE YOUR LETTER TO ONE SUBJECT ONLY"

xc: W.H. Coleman, II/File
T.C. Douglas
L.B. Bosquet
F.L. Supry
File

RESEARCH TEST AND MEASUREMENT REPORT

REPORT# 881313
JULY 22, 1988

MODEL 700 MOUNTAIN RIFLE
243 CALIBER FUNCTION AND ACCURACY VERIFICATION

REJECTED SAMPLE

MODEL 700 MOUNTAIN RIFLE
243 CALIBER FUNCTION AND ACCURACY VERIFICATION

ABSTRACT:

The testing on the production sample of the 243 caliber Model 700 Mountain Rifle was stopped and the five rifles returned to production.

The 243 caliber Model 700 Mountain Rifles tested did not meet Remington specifications (2.2 inches) for group size. The five rifles tested shot an average group size of 2.36 inches, with three of the five rifles shooting erratic groups.

Another function and accuracy test will be conducted with a production sample when the sample becomes available.

Prepared by: F.L. Supry
Date: July 22, 1988

MODEL 700 MOUNTAIN RIFLE
243 CALIBER FUNCTION AND ACCURACY VERIFICATION

TO: H.C. Munson
FROM: F.L. Supry

INTRODUCTION:

In May, 1988, a request to conduct a Function and Accuracy evaluation of the 243 caliber, Model 700 Mountain Rifles was received by the Test Lab. The first request was received in May, 1988, and that sample was rejected because three of the five samples did not meet Remington 100 yard accuracy specifications for 243 caliber rifles.

Each evaluation used five rifles selected from a production rifle sample in the Ilion warehouse.

SCOPE OF THE TEST:

To determine if the production run samples would meet Remington Specifications set by the Research Design Section.

TEST RESULTS:

The production sample of the 243 caliber, Model 700 Mountain Rifles, was found to be unacceptable. The results of the testing were as follows:

ACCURACY:

The average group size was 2.36 inches.

FUNCTION:

There were no malfunctions on any of the five rifles tested.

MODEL 700 MOUNTAIN RIFLE
243 CALIBER FUNCTION AND ACCURACY VERIFICATION

REPORT TEXT:

GENERAL:

The following five rifles were used throughout the accuracy and function test.

C6237399 C6237389 C6237386 C6237435 C6233183

ACCURACY:

The results showed that this sample of the 243 caliber, Model 700 Mountain Rifles tested did not meet the Remington specification (2.2 inches) for group size.

All five of the rifles were used for the 100 yard accuracy testing and the following results were obtained:

100 YARD ACCURACY RESULTS

SERIAL NUMBER	GROUP 1 (in.)	GROUP 2 (in.)	GROUP 3 (in.)	AVERAGE (in.)
C6237435	1.67	1.86	2.31	1.95
C6237399	2.58	2.03	3.03	2.55
C6237389	2.54	2.48	3.62	2.88
C6233183	1.66	1.85	1.95	1.82
C6237386	2.40	2.90	2.44	2.58

FUNCTION:

All five rifles were fired 20 rounds each in a function test conducted in the R&D 200 yard range.

No malfunctions occurred.

MODEL 700 MOUNTAIN RIFLE
243 CALIBER FUNCTION AND ACCURACY VERIFICATION

TEST PROCEDURE:

ACCURACY:

Three, five shot groups were shot with each of the five rifles selected for 100 yard accuracy. The accuracy was shot by C.J. Stephens in the Research and Development 100 yard range located in building 52-1A.

Remington ammunition code (A18C D3405) R243W3 (100 grain PSP) was used for the accuracy testing.

Standard short action Leupold bases and rings were used in conjunction with a 20X Lyman scope.

The targets were analyzed for group size using the HP 9000 computer and digitizing tablet.

FUNCTION:

All five of the rifles were subjected to the loading and firing of 20 rounds 100 grain pointed soft point Remington 243 caliber ammunition in a function test conducted at the R&D 200 yard range.

RYNITE INSERTS
MODEL 700 880611

REMINGTON ARMS COMPANY, INC.

INTER-DEPARTMENTAL CORRESPONDENCE

Remington. DU PONT   PETERS DU PONT

"CONFINE YOUR LETTER TO ONE SUBJECT ONLY"

xc: W.H. Coleman, II/File
T.C. Douglas
J.R. Snedeker
H.C. Munson
B.L. Bosquet
F.L. Supry

RESEARCH TEST AND MEASUREMENT REPORT
REPORT# 880611
MARCH 15, 1988

MODEL 700 (RYNITE STOCK INSERT) DESIGN VERIFICATION

RP# 880611 WO# 480257-001800

MODEL 700 (RYNITE STOCK INSERT) DESIGN VERIFICATION

ABSTRACT:

The Test and Measurement Laboratory finds the Design Verification of the Model 700, Rynite stock insert, to be acceptable. The testing consisted of 100 yard accuracy, comparing the results of the actions shot in the experimental Rynite stocks to the results of the same actions shot in a standard wood stock.

Ten rifles were used for the Design Verification test. The accuracy was shot by D.R. Thomas and J.E. Selan. All the rifles tested were within Remington 100 yard accuracy specifications.

Prepared by: F.L. Supry
Date Prepared: March 15, 1987

proofread and cleared by:

H.C. MUNSON, Quality Resource

W.H. COLEMAN, II
New Products Research Lab Director

3/22/88

RP# 880611 WO# 480257-001800

To: H.C. Munson
From: F.L. Supry

INTRODUCTION:

A request was received from B.L. Bosquet on March 01, 1988 to conduct a design verification test on the Model 700 30-06 caliber Rifles assembled in Rynite stocks with experimental barrel alignment inserts. The experimental barrel alignment inserts were attached to the stocks by Remington personnel. If the barrel alignment inserts are successful, Choate will incorporate them in the mold for the Rynite stocks.

SCOPE OF TEST:

To determine if the Model 700 rifles assembled in the experimental stocks would meet the Remington 100 yard accuracy specifications. And, to make a direct comparison of those accuracy results to the results of shooting the same actions assembled in a standard wood stock.

TEST RESULTS:

All the rifles tested were within Remington specifications for 100 yard accuracy. The following average group sizes were established:

STOCK TYPE	REMINGTON SPECIFICATIONS	ACCURACY RESULTS
RYNITE W/INSERTS	3.5 inches	1.941 inches
WOOD	3.5 inches	1.949 inches

REPORT TEXT:

Ten rifles were shot, with three groups shot for each rifle consisting of five shots per group.

Remington 180 grain bronze point ammunition (R30066 code H20 MC2825) was used throughout the test.

Individual accuracy results are listed in the appendix of this report.

TEST PROCEDURE:

The accuracy was shot by D.R. Thomas and J.E. Selan in the R&D 100 yard range, located in building 52-1.

Standard long action Leupold bases and Leupold rings were used, in conjunction with a 20X All-American scope.

A total of three, five shot groups, were shot for each rifle. The rifles were cooled and cleaned between each group, and one fouling shot fired before the next group was shot. After three groups were shot with the rifle in the Rynite stock, the action was removed and reassembled in the wood stock and the accuracy procedure repeated.

The targets were analyzed for group size, using the HP 9000 computer and digitizing tablet.

APPENDIX

MODEL 700 (RYNITE STOCK INSERT) DESIGN VERIFICATION

SERIAL NUMBER	TYPE OF STOCK	GROUP 1 (in.)	GROUP 2 (in.)	GROUP 3 (in.)	AVERAGE (in.)
B6889568	R	2.597	1.664	2.003	2.088
	W	2.485	1.346	1.172	1.668
B6889854	R	2.434	1.580	1.458	1.824
	W	2.135	2.902	2.280	2.439
B6889601	R	1.939	2.223	3.141	2.438
	W	2.356	0.898	1.625	1.626
B6887819	R	0.916	1.290	2.536	1.581
	W	1.951	1.606	4.528	2.695
B6889548	R	2.265	2.121	2.108	2.165
	W	1.625	1.473	1.215	1.438
B6889880	R	2.150	1.516	1.924	1.763
	W	2.962	2.004	2.194	2.387
B6889562	R	2.193	2.371	1.929	2.164
	W	1.619	2.212	2.104	1.978
B6889478	R	1.686	3.156	1.839	2.227
	W	2.068	1.590	2.369	2.009
B6889538	R	1.848	1.992	1.567	1.802
	W	1.268	1.850	1.242	1.453
C6204413	R	1.639	1.556	0.885	1.360
	W	1.712	1.939	1.727	1.793
OVERAGE AVERAGE	R	-----	-----	-----	1.941
	W	-----	-----	-----	1.949

RIFLE #	RYNITE STOCK	WOOD STOCK
B688 9568	2.088	1.668
B688 9601	2.438	1.626
7819	1.581	2.695
B688 9538	1.802	1.453
9854	1.824	2.439
9478	2.227	2.009
9548	2.165	1.438
9562	2.164	1.978
C620 4413	1.360	1.793
9880	1.763	2.387
AVG =	1.911	1.949

Report No. 880611

RESEARCH TEST & MEASUREMENT LAB WORK REQUEST

AREA OF TESTING

___ Developmental	___ Safety Related	___ Litigation
✓ Design Acceptance	___ Competitive Evaluation	___ Warehouse Audit
___ Pre-Pilot	___ New Design	___ Cost Reduction
___ Pilot	X Design Change	Stake ___
___ Production Acceptance	X Plant Assistance	___ Other

FIREARM STAT'S.	REPORT REQ'D.	
MODEL: 700	SEMI-FORMAL X	DATE REQUESTED: 3/1/88
CAL or GAGE: 30-06		DATE NEEDED BY: 3/22/88
BARREL TYPE: ___	TEST RESULTS ONLY ___	REQUESTED BY: Bosquet
PROOFED: YES X NO ___		WORK ORDER NO: 480257

TEST TYPE

___ Strength Test	___ Ammunition Test	___ Dry Cycle Test	___ Photo/Video
___ Function Test	___ Environmental Test	___ Measurements	___ Other ___
X Accuracy Test	___ Customer Complaint	___ Endurance Test	___

EXPLAIN IN DETAIL THE REASON FOR THIS TEST:

Shot 3, 5 shot groups, with each rifle.
Shot ~~2~~ 3 additional 5 shot groups with each action in the wooden stock provided.

(180 gr BP)

GUNS REQUIRED:

Ten rifles with special bedding at the fore-end (choate stocks)
one wooden stock

NOTE: NO firearms or parts will be tested in the Labs unless they are accompanied by a Work Request, and both are delivered to the Labs by the designer or engineer. All Work Requests are to be filled out in detail. No Exceptions.

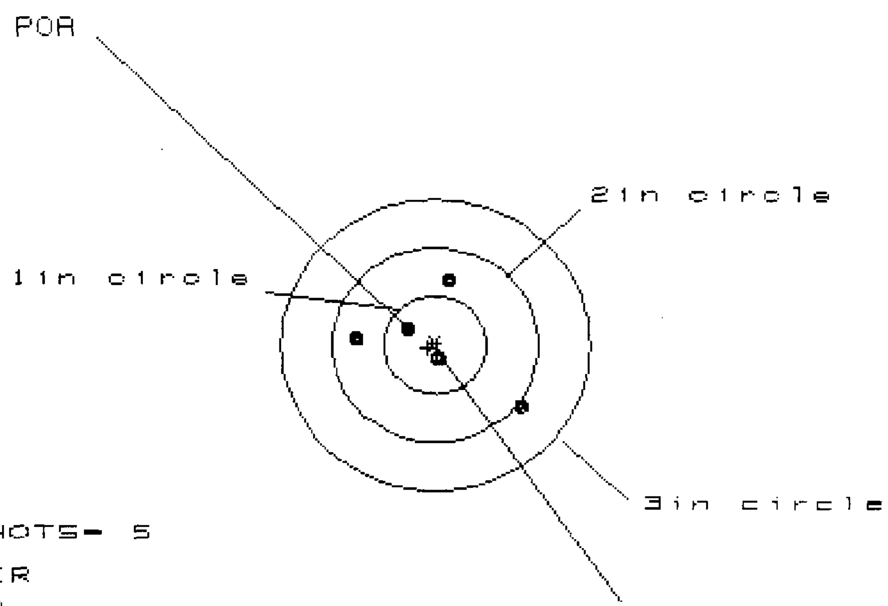
DATE COMPLETED: 3/12/
TEST COMPLETED BY: LAB
REPORT DATE: 3/15/88

180gr BP

~~9880~~	Rynite	DT	1.8	
~~4413~~	Rynite	JS	1.3	
~~9880~~	Wood	DT	2.0	
~~4413~~	Wood	JS	1.8	
~~9562~~	Rynite	DT	1.9	
~~9548~~	Rynite	JS	2.0	
~~9562~~	Wood	DT	1.9	
~~9548~~	Wood	JS	1.3	
~~9478~~	Rynite	DT	2.0	
~~9854~~	~~RYNITE~~	J.S.	1.9	(1.7 - EST. DT)
~~9478~~	Wood	DT	2.0	
~~9854~~	Wood	J.S	2.7	(2.3 EST. DT. (BLIND))
~~9538~~	Rynite	DT	1.5	
~~7019~~	RYNITE -	J.S.	1.5	
~~9538~~	Wood	DT	1.3	
~~7019~~	Wood	JS	1.5	
~~9401~~	Rynite	DT	2.3	
~~9568~~	RYNITE	J.S.	1.9	
~~9401~~	Wood	DT	1.8	
~~9068~~	Wood	JS	1.5	

11 Mar 1988 FILE:/PATTERNING/CENTERFIRE_PATT/4413NJS

CENTERFIRE PATTERNS # 1



\# OF SHOTS= 5

\# IN CIR
1in = 2
2in = 4
3in = 5

HS= 1.561
VS= 1.333
GS= 1.712

1.793

PATTERN # : 1

SHOTS (BEST OF)	:	5	4	3
MAXIMUM X	:	.811	.317	.135
MINIMUM X	:	-.750	-.547	-.211
MAXIMUM Y	:	.656	.486	.438
MINIMUM Y	:	-.677	-.347	-.395
CENTROID X	:	.070	-.133	.049
CENTROID Y	:	.030	.200	.248
POA TO CENTROID in.	:	.076	.240	.253
ANGLE POA CENTROID	:	23.595	146.293	78.823
MIN RADIUS	:	.186	.029	.215
MEAN RADIUS	:	.590	.402	.359
MAX RADIUS	:	1.057	.581	.458
HORIZONTAL SPREAD	:	1.561	.864	.346
VERTICAL SPREAD	:	1.333	.833	.833
EXTREME SPREAD	:	1.712	1.070	.835

NUMBER IN ONE INCH CIRCLE = 2
NUMBER IN TWO INCH CIRCLE = 4
NUMBER IN THREE INCH CIRCLE = 5

11 Mar 1988 FILE:/PATTERNING/CENTERFIRE_PATT/4413NJS

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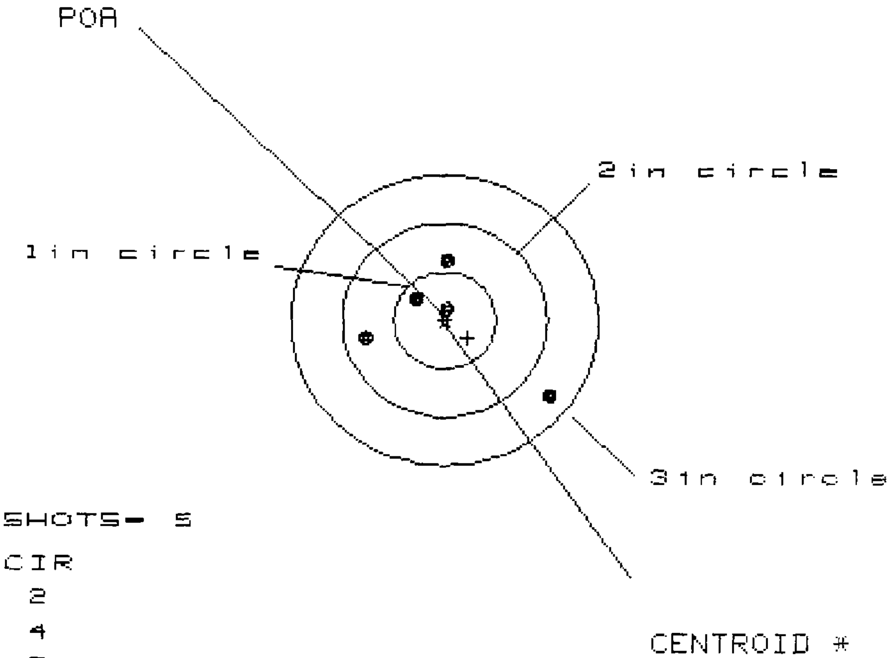


OF SHOTS= 5

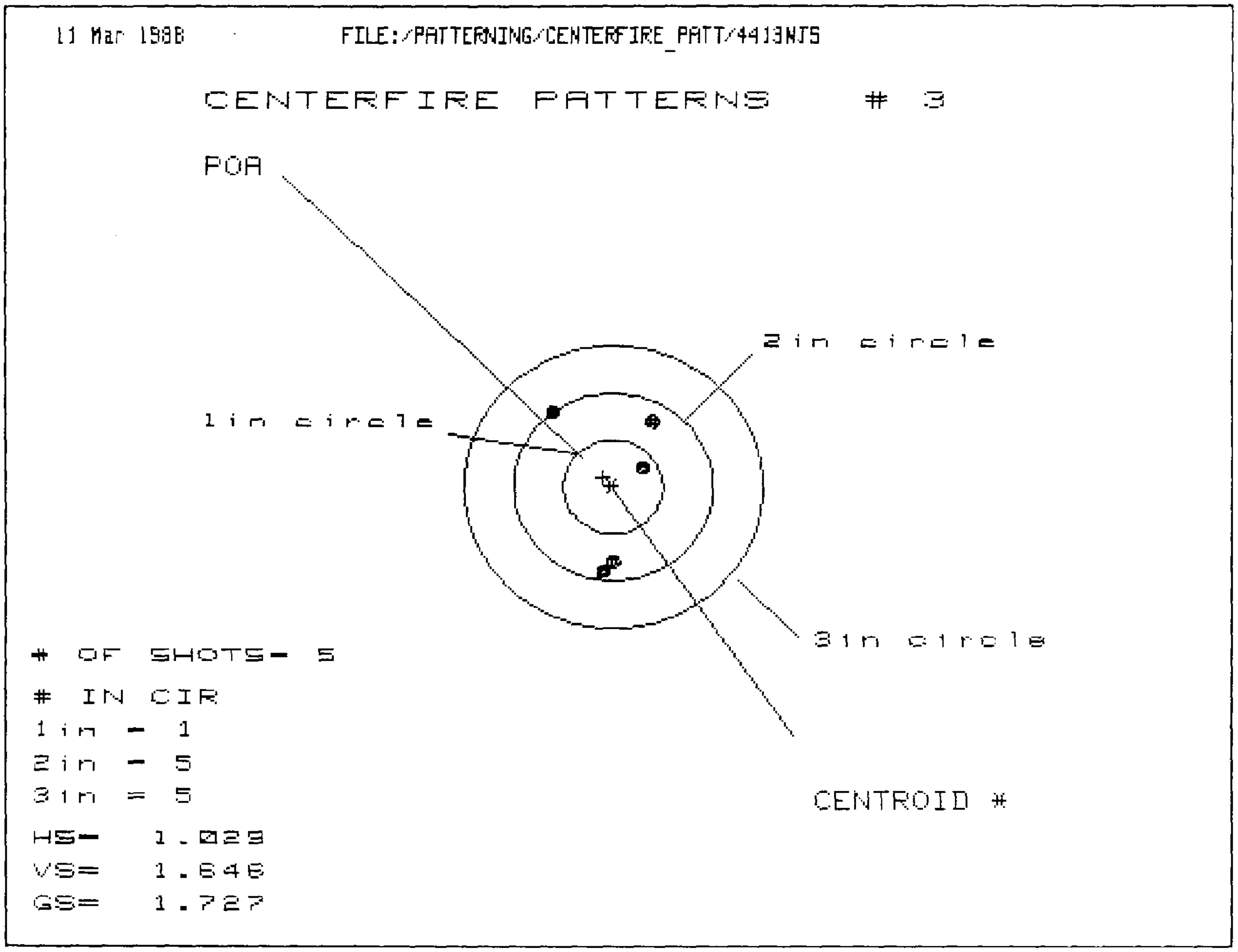
# IN CIR
1in = 2
2in = 4
3in = 5

HS= 1.823
VS= 1.456
GS= 1.939

PATTERN # : 2

SHOTS (BEST OF)	:	5	4	3
MAXIMUM X	:	1.024	.328	.147
MINIMUM X	:	-.799	-.542	-.229
MAXIMUM Y	:	.641	.437	.317
MINIMUM Y	:	-.815	-.358	-.231
CENTROID X	:	-.226	-.482	-.302
CENTROID Y	:	.178	.382	.502
POA TO CENTROID in.	:	.288	.616	.585
ANGLE POA CENTROID	:	128.238	128.387	148.980
MIN RADIUS	:	.117	.059	.245
MEAN RADIUS	:	.653	.391	.282
MAX RADIUS	:	1.309	.650	.328
HORIZONTAL SPREAD	:	1.823	.870	.376
VERTICAL SPREAD	:	1.456	.795	.548
EXTREME SPREAD	:	1.939	1.132	.552

NUMBER IN ONE INCH CIRCLE = 2
NUMBER IN TWO INCH CIRCLE = 4
NUMBER IN THREE INCH CIRCLE = 5



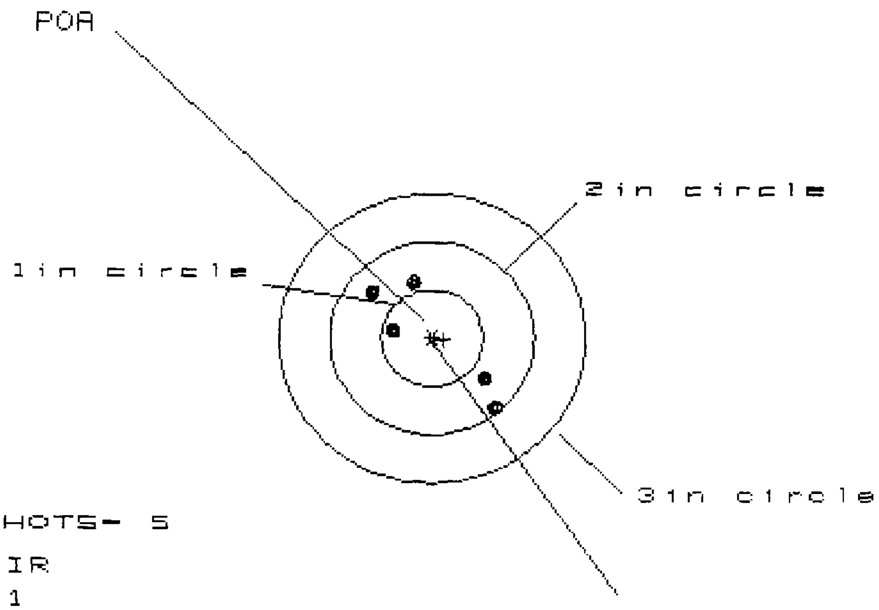
PATTERN # : 3

SHOTS (BEST OF) :	5	4	3
MAXIMUM X :	.412	.258	.174
MINIMUM X :	-.617	-.249	-.191
MAXIMUM Y :	.752	.887	.652
MINIMUM Y :	-.894	-.706	-.847
CENTROID X :	.099	.254	.337
CENTROID Y :	-.100	-.288	-.053
POA TO CENTROID in.:	.141	.384	.341
ANGLE POA CENTROID :	315.344	318.695	279.002
MIN RADIUS :	.350	.441	.195
MEAN RADIUS :	.767	.684	.579
MAX RADIUS :	.973	.924	.868
HORIZONTAL SPREAD :	1.029	.507	.365
VERTICAL SPREAD :	1.646	1.593	1.499
EXTREME SPREAD :	1.727	1.672	1.543

NUMBER IN ONE INCH CIRCLE = 1
NUMBER IN TWO INCH CIRCLE = 5
NUMBER IN THREE INCH CIRCLE = 5

11 Mar 1988 FILE:/PATTERNING/CENTERFIRE_PATT/4413RJS

CENTERFIRE PATTERNS # 1



\# OF SHOTS= 5

\# IN CIR
1 in - 1
2 in - 5
3 in = 5

HS= 1.147
VS= 1.288
GS= 1.639

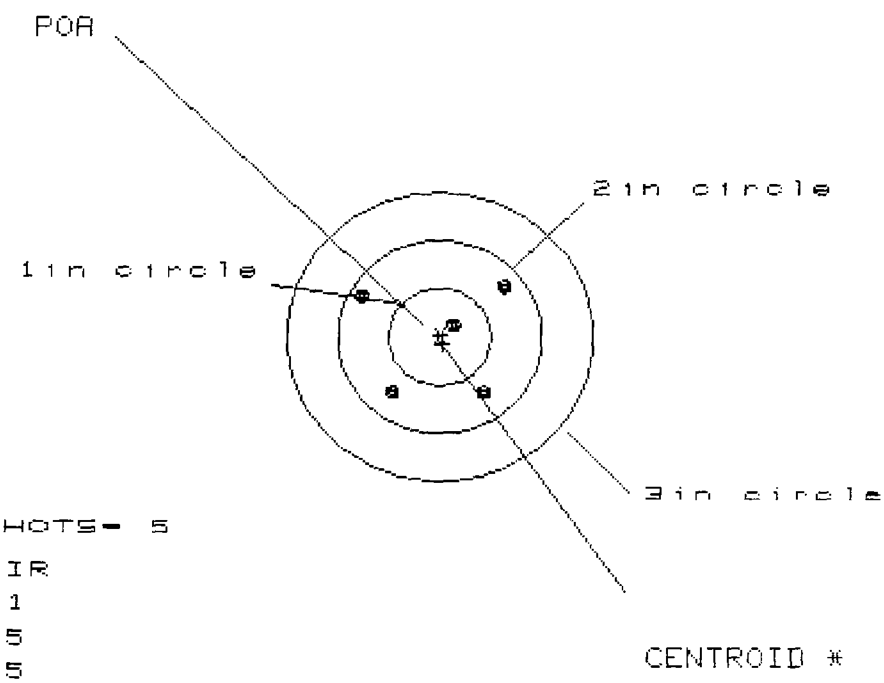
1.360

PATTERN #	:	1		
SHOTS (BEST OF)	:	5	4	3
MAXIMUM X	:	.578	.709	.568
MINIMUM X	:	-.569	-.424	-.421
MAXIMUM Y	:	.575	.396	.490
MINIMUM Y	:	-.713	-.605	-.512
CENTROID X	:	-.116	-.261	-.120
CENTROID Y	:	.017	.196	.102
POA TO CENTROID in.	:	.118	.326	.157
ANGLE POA CENTROID	:	98.406	126.835	130.536
MIN RADIUS	:	.438	.289	.422
MEAN RADIUS	:	.678	.531	.566
MAX RADIUS	:	.918	.932	.765
HORIZONTAL SPREAD	:	1.147	1.133	.989
VERTICAL SPREAD	:	1.288	1.002	1.002
EXTREME SPREAD	:	1.639	1.438	1.230

NUMBER IN ONE INCH CIRCLE = 1
NUMBER IN TWO INCH CIRCLE = 5
NUMBER IN THREE INCH CIRCLE = 5

11 Mar 1988 FILE:/PATTERNING/CENTERFIRE_PATT/4413RT5

CENTERFIRE PATTERNS # 2



OF SHOTS= 5

IN CIR
1 in = 1
2 in = 5
3 in = 5

HS= 1.348
VS= 1.162
GS= 1.556

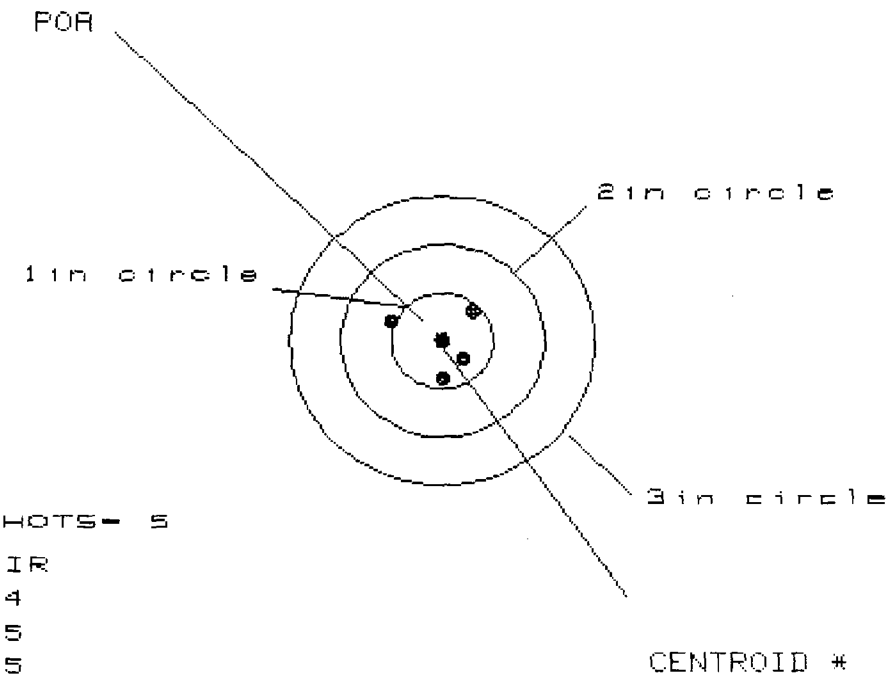
PATTERN # : 2

SHOTS (BEST OF)	:	5	4	3
MAXIMUM X	:	.617	.597	.405
MINIMUM X	:	-.731	-.576	-.505
MAXIMUM Y	:	.574	.524	.493
MINIMUM Y	:	-.588	-.445	-.270
CENTROID X	:	-.030	-.185	.007
CENTROID Y	:	.074	-.070	-.244
POA TO CENTROID in.	:	.080	.197	.244
ANGLE POA CENTROID	:	157.667	200.615	358.281
MIN RADIUS	:	.223	.433	.486
MEAN RADIUS	:	.668	.616	.514
MAX RADIUS	:	.843	.779	.553
HORIZONTAL SPREAD	:	1.348	1.173	.910
VERTICAL SPREAD	:	1.162	.969	.763
EXTREME SPREAD	:	1.556	1.521	.939

NUMBER IN ONE INCH CIRCLE = 1
NUMBER IN TWO INCH CIRCLE = 5
NUMBER IN THREE INCH CIRCLE = 5

11 Mar 1988 FILE:/PATTERNING/CENTERFIRE_PATT/4413RJ5

CENTERFIRE PATTERNS # 3



\# OF SHOTS= 5

\# IN CIR
1 in = 4
2 in = 5
3 in = 5

HS= .872
VS= .719
GS= .885

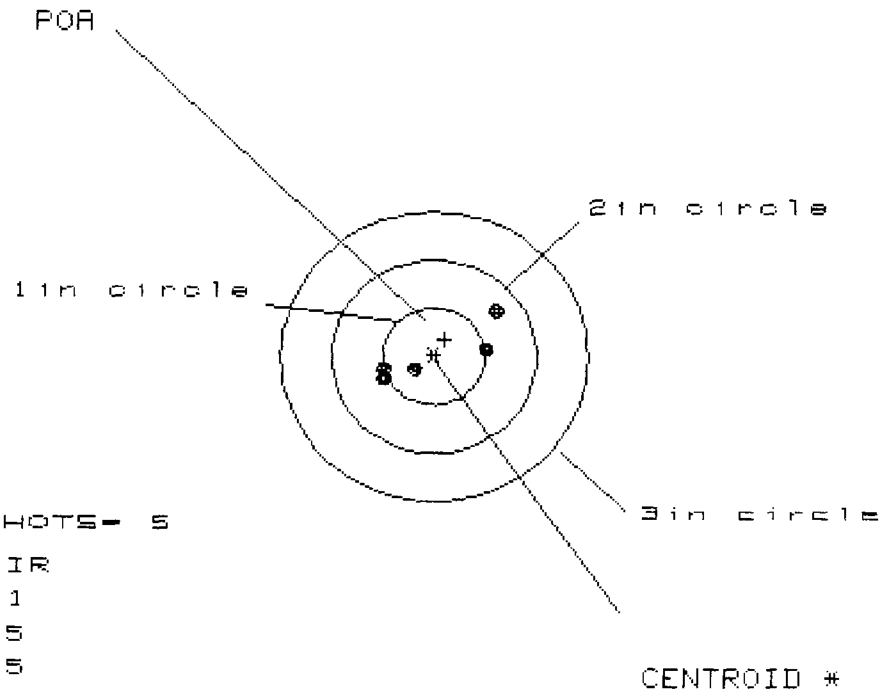
PATTERN # : 3

	:			
SHOTS (BEST OF)	:	5	4	3
MAXIMUM X	:	.335	.201	.143
MINIMUM X	:	-.537	-.139	-.072
MAXIMUM Y	:	.346	.395	.192
MINIMUM Y	:	-.373	-.325	-.193
CENTROID X	:	-.000	.134	.067
CENTROID Y	:	-.013	-.061	-.193
POA TO CENTROID in.	:	.013	.147	.204
ANGLE POA CENTROID	:	268.238	294.694	340.944
MIN RADIUS	:	.013	.151	.143
MEAN RADIUS	:	.343	.275	.185
MAX RADIUS	:	.571	.443	.206
HORIZONTAL SPREAD	:	.872	.340	.215
VERTICAL SPREAD	:	.719	.719	.385
EXTREME SPREAD	:	.885	.795	.385

NUMBER IN ONE INCH CIRCLE = 4
NUMBER IN TWO INCH CIRCLE = 5
NUMBER IN THREE INCH CIRCLE = 5

11 Mar 1988 FILE:/PATTERNING/CENTERFIRE_PATT/9538NDT

CENTERFIRE PATTERNS # 1



OF SHOTS= 5

# IN CIR
1in = 1
2in = 5
3in = 5

HS= 1.124
VS= .687
GS= 1.268

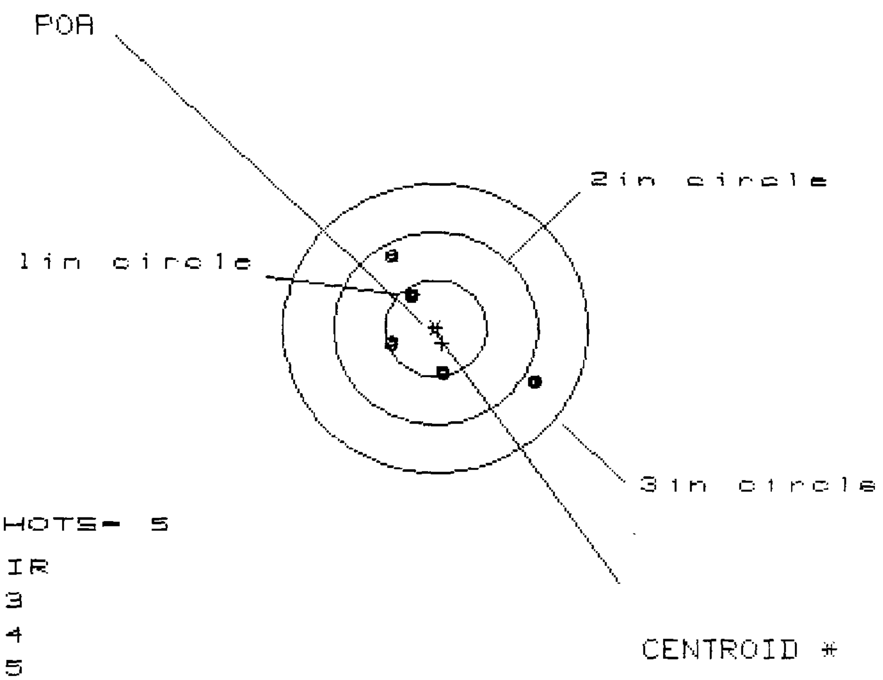
1.453

PATTERN #	:	1		
SHOTS (BEST OF)	:	5	4	3
MAXIMUM X	:	.616	.658	.540
MINIMUM X	:	-.508	-.353	-.413
MAXIMUM Y	:	.444	.170	.171
MINIMUM Y	:	-.243	-.133	-.132
CENTROID X	:	-.107	-.262	-.144
CENTROID Y	:	-.176	-.286	-.287
POA TO CENTROID in.	:	.206	.388	.321
ANGLE POA CENTROID	:	238.549	227.612	243.382
MIN RADIUS	:	.221	.039	.132
MEAN RADIUS	:	.504	.349	.377
MAX RADIUS	:	.759	.679	.566
HORIZONTAL SPREAD	:	1.124	1.011	.953
VERTICAL SPREAD	:	.687	.303	.303
EXTREME SPREAD	:	1.268	1.025	1.000

NUMBER IN ONE INCH CIRCLE = 1
NUMBER IN TWO INCH CIRCLE = 5
NUMBER IN THREE INCH CIRCLE = 5

11 Mar 1988 FILE:/PATTERNING/CENTERFIRE_PATT/9538NDT

CENTERFIRE PATTERNS # 2



OF SHOTS= 5

# IN CIR
1in = 3
2in = 4
3in = 5

HS= 1.366
VS= 1.274
GS= 1.850

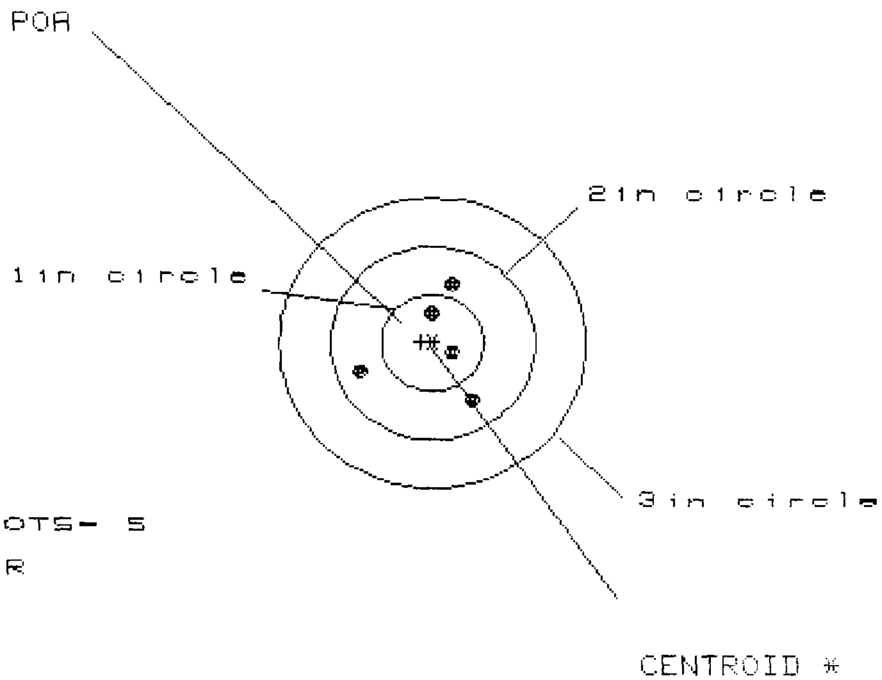
PATTERN # : 2

SHOTS (BEST OF)	:	5	4	3
MAXIMUM X	:	.939	.326	.270
MINIMUM X	:	-.427	-.193	-.249
MAXIMUM Y	:	.731	.595	.458
MINIMUM Y	:	-.543	-.605	-.407
CENTROID X	:	-.069	-.303	-.247
CENTROID Y	:	.151	.287	.089
POA TO CENTROID in.	:	.166	.418	.263
ANGLE POA CENTROID	:	155.596	133.423	109.722
MIN RADIUS	:	.442	.262	.254
MEAN RADIUS	:	.657	.471	.400
MAX RADIUS	:	1.084	.687	.488
HORIZONTAL SPREAD	:	1.366	.519	.519
VERTICAL SPREAD	:	1.274	1.200	.865
EXTREME SPREAD	:	1.850	1.298	.913

NUMBER IN ONE INCH CIRCLE = 3
NUMBER IN TWO INCH CIRCLE = 4
NUMBER IN THREE INCH CIRCLE = 5

11 Mar 1988 FILE:/PATTERNING/CENTERFIRE_PATT/9538NDT

CENTERFIRE PATTERNS # 3



OF SHOTS= 5

# IN CIR
1in = 2
2in = 5
3in = 5

HS= 1.152
VS= 1.166
GS= 1.242

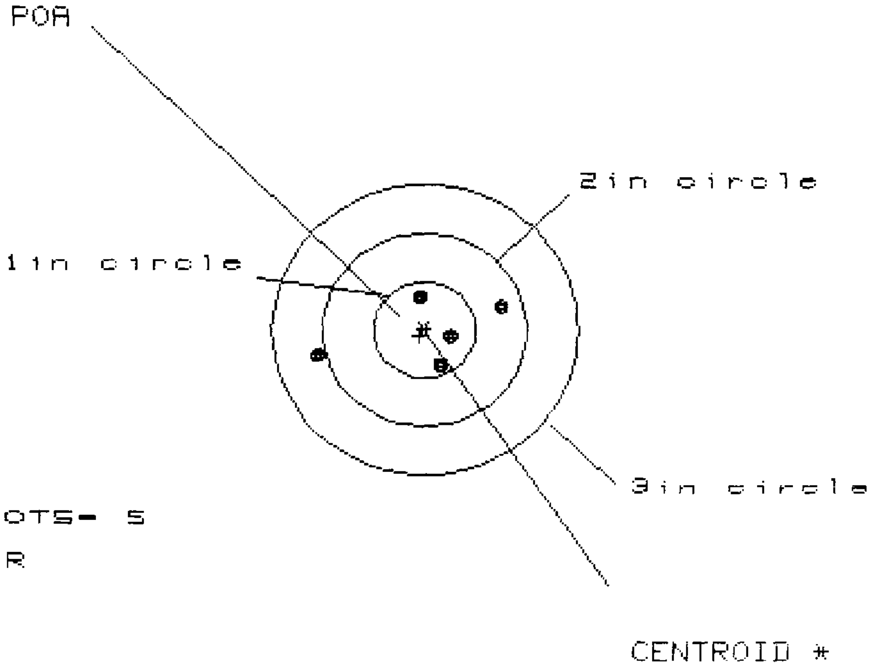
PATTERN # : 3

SHOTS (BEST OF)	:	5	4	3
MAXIMUM X	:	.436	.257	.064
MINIMUM X	:	-.716	-.200	-.114
MAXIMUM Y	:	.593	.516	.300
MINIMUM Y	:	-.573	-.649	-.342
CENTROID X	:	.110	.289	.203
CENTROID Y	:	-.013	.064	.280
POA TO CENTROID in.	:	.111	.296	.346
ANGLE POA CENTROID	:	276.546	12.403	54.058
MIN RADIUS	:	.165	.127	.121
MEAN RADIUS	:	.522	.418	.258
MAX RADIUS	:	.778	.699	.348
HORIZONTAL SPREAD	:	1.152	.457	.178
VERTICAL SPREAD	:	1.166	1.166	.642
EXTREME SPREAD	:	1.242	1.202	.642

NUMBER IN ONE INCH CIRCLE = 2
NUMBER IN TWO INCH CIRCLE = 5
NUMBER IN THREE INCH CIRCLE = 5

11 Mar 1988 FILE:/PATTERNING/CENTERFIRE_PATT/9538RDT

CENTERFIRE PATTERNS # 1



OF SHOTS= 5

IN CIR
1in - 3
2in - 4
3in = 5

HS= 1.803
VS= .690
GS= 1.848

1,802

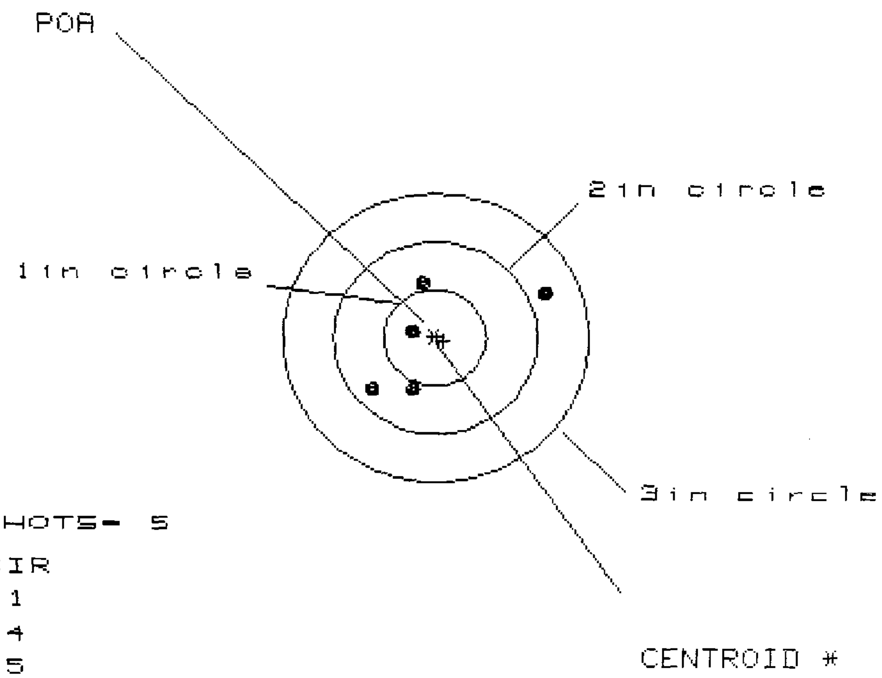
PATTERN # : 1

SHOTS (BEST OF)	:	5	4	3
MAXIMUM X	:	.755	.493	.122
MINIMUM X	:	-1.048	-.347	-.183
MAXIMUM Y	:	.368	.315	.362
MINIMUM Y	:	-.322	-.376	-.328
CENTROID X	:	.048	.310	.146
CENTROID Y	:	.057	.111	.063
POA TO CENTROID in.	:	.075	.329	.159
ANGLE POA CENTROID	:	49.979	19.604	23.451
MIN RADIUS	:	.222	.091	.126
MEAN RADIUS	:	.561	.365	.289
MAX RADIUS	:	1.070	.513	.405
HORIZONTAL SPREAD	:	1.803	.840	.305
VERTICAL SPREAD	:	.690	.690	.690
EXTREME SPREAD	:	1.848	.858	.732

NUMBER IN ONE INCH CIRCLE = 3
NUMBER IN TWO INCH CIRCLE = 4
NUMBER IN THREE INCH CIRCLE = 5

11 Mar 1988 FILE:/PATTERNING/CENTERFIRE_PATT/9538RDT

CENTERFIRE PATTERNS # 2



OF SHOTS- 5

IN CIR
1 in - 1
2 in - 4
3 in = 5

HS- 1.704
VS= 1.130
GS= 1.992

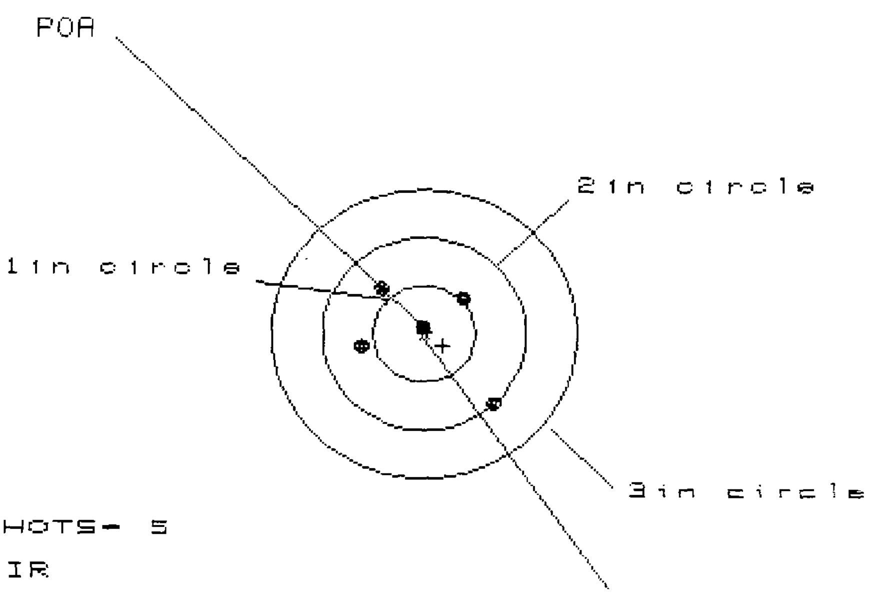
PATTERN # : 2

SHOTS (BEST OF)	:	5	4	3
MAXIMUM X	:	1.100	.188	.078
MINIMUM X	:	-.604	-.329	-.066
MAXIMUM Y	:	.556	.670	.517
MINIMUM Y	:	-.574	-.460	-.524
CENTROID X	:	-.079	-.354	-.244
CENTROID Y	:	.032	-.082	.071
POA TO CENTROID in.	:	.085	.363	.254
ANGLE POA CENTROID	:	112.051	193.080	106.203
MIN RADIUS	:	.184	.187	.014
MEAN RADIUS	:	.662	.456	.355
MAX RADIUS	:	1.191	.696	.528
HORIZONTAL SPREAD	:	1.704	.517	.144
VERTICAL SPREAD	:	1.130	1.130	1.041
EXTREME SPREAD	:	1.992	1.243	1.051

NUMBER IN ONE INCH CIRCLE = 1
NUMBER IN TWO INCH CIRCLE = 4
NUMBER IN THREE INCH CIRCLE = 5

11 Mar 1988 FILE:/PATTERNING/CENTERFIRE_PATT/8538RDT

CENTERFIRE PATTERNS # 3



OF SHOTS- 5

IN CIR
1 in - 2
2 in - 5
3 in = 5

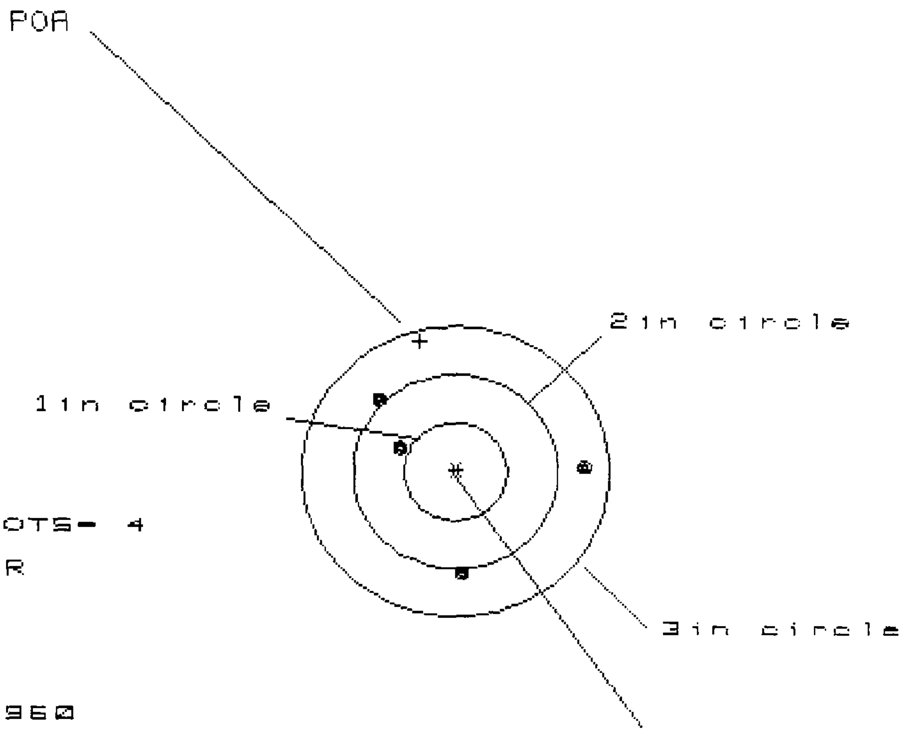
HS- 1.264
VS= 1.124
GS= 1.567

PATTERN #	:	3		
SHOTS (BEST OF)	:	5	4	3
MAXIMUM X	:	.662	.502	.357
MINIMUM X	:	-.602	-.436	-.409
MAXIMUM Y	:	.437	.265	.159
MINIMUM Y	:	-.687	-.318	-.234
CENTROID X	:	-.184	-.350	-.205
CENTROID Y	:	.123	.295	.401
POA TO CENTROID in.	:	.222	.458	.451
ANGLE POA CENTROID	:	123.790	130.150	152.980
MIN RADIUS	:	.054	.236	.240
MEAN RADIUS	:	.546	.421	.348
MAX RADIUS	:	.955	.540	.439
HORIZONTAL SPREAD	:	1.264	.938	.766
VERTICAL SPREAD	:	1.124	.583	.393
EXTREME SPREAD	:	1.567	1.063	.770

NUMBER IN ONE INCH CIRCLE = 2
NUMBER IN TWO INCH CIRCLE = 5
NUMBER IN THREE INCH CIRCLE = 5

11 Mar 1988 FILE:/PATTERNING/CENTERFIRE_PATT/9478NDT

CENTERFIRE PATTERNS # 1



OF SHOTS= 4

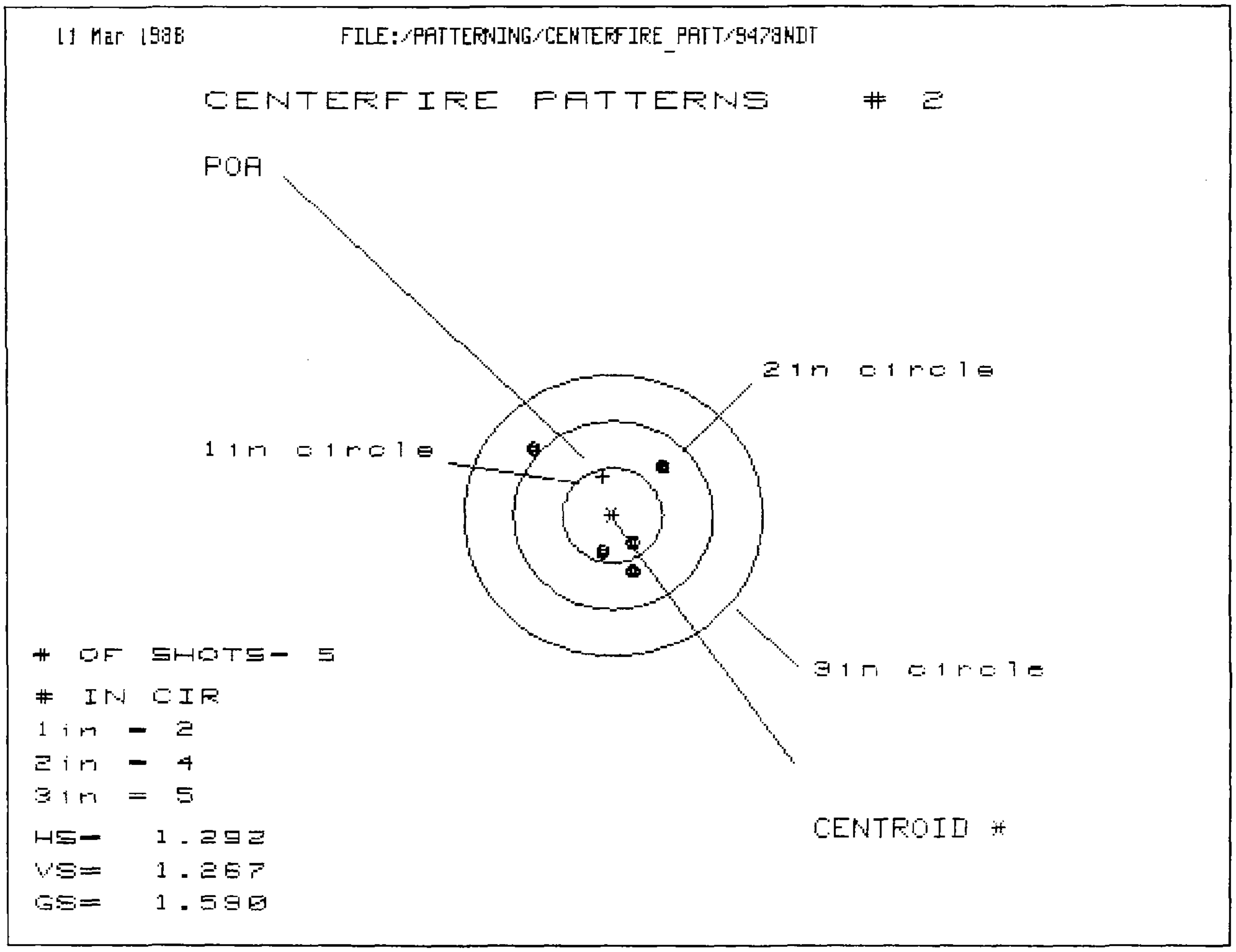
# IN CIR
1in = 0
2in = 1
3in = 4

HS= 1.960
VS= 1.811
GS= 2.068 2.009

CENTROID *

PATTERN #	:	1		
SHOTS (BEST OF)	:	4	3	2
MAXIMUM X	:	1.214	.468	.108
MINIMUM X	:	-.746	-.342	-.108
MAXIMUM Y	:	.733	.757	.231
MINIMUM Y	:	-1.078	-1.054	-.230
CENTROID X	:	.345	-.059	-.293
CENTROID Y	:	-1.349	-1.373	-.847
POA TO CENTROID in.	:	1.392	1.375	.896
ANGLE POA CENTROID	:	345.632	267.540	250.908
MIN RADIUS	:	.596	.322	.255
MEAN RADIUS	:	.984	.769	.255
MAX RADIUS	:	1.216	1.153	.255
HORIZONTAL SPREAD	:	1.960	.810	.216
VERTICAL SPREAD	:	1.811	1.811	.461
EXTREME SPREAD	:	2.068	1.984	.509

NUMBER IN ONE INCH CIRCLE = 0
NUMBER IN TWO INCH CIRCLE = 1
NUMBER IN THREE INCH CIRCLE = 4



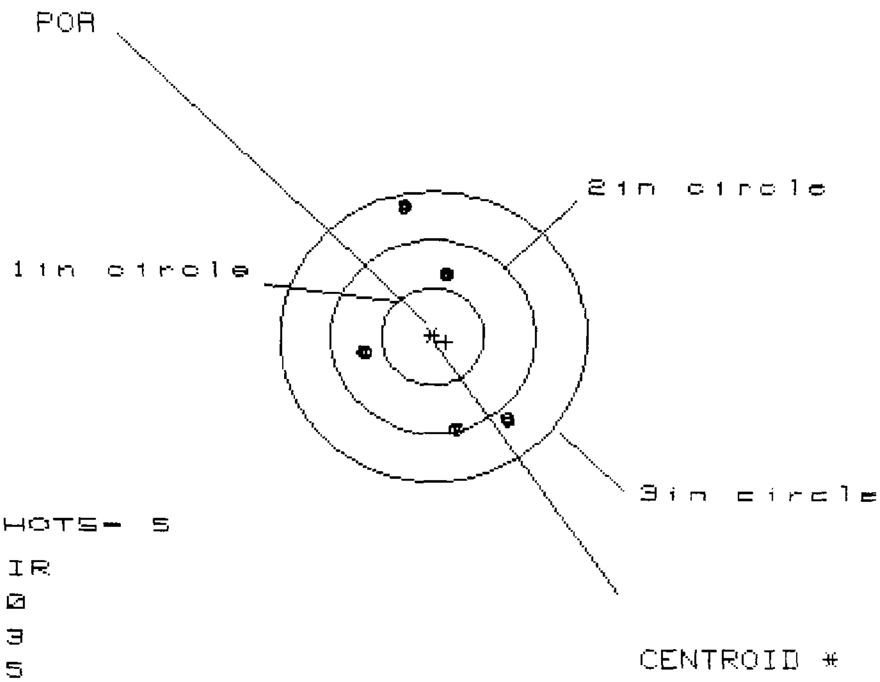
PATTERN # : 2

SHOTS (BEST OF)	:	5	4	3
MAXIMUM X	:	.498	.299	.090
MINIMUM X	:	-.794	-.258	-.158
MAXIMUM Y	:	.711	.669	.155
MINIMUM Y	:	-.556	-.378	-.155
CENTROID X	:	.098	.297	.197
CENTROID Y	:	-.412	-.590	-.813
POA TO CENTROID in.	:	.424	.661	.837
ANGLE POA CENTROID	:	346.606	333.309	346.384
MIN RADIUS	:	.310	.068	.158
MEAN RADIUS	:	.612	.380	.169
MAX RADIUS	:	1.066	.733	.180
HORIZONTAL SPREAD	:	1.292	.557	.248
VERTICAL SPREAD	:	1.267	1.047	.310
EXTREME SPREAD	:	1.590	1.098	.311

NUMBER IN ONE INCH CIRCLE = 2
NUMBER IN TWO INCH CIRCLE = 4
NUMBER IN THREE INCH CIRCLE = 5

11 Mar 1988 FILE:/PATTERNING/CENTERFIRE_PATT/9478NDT

CENTERFIRE PATTERNS # 3



\# OF SHOTS- 5

\# IN CIR
1in - 0
2in - 3
3in = 5

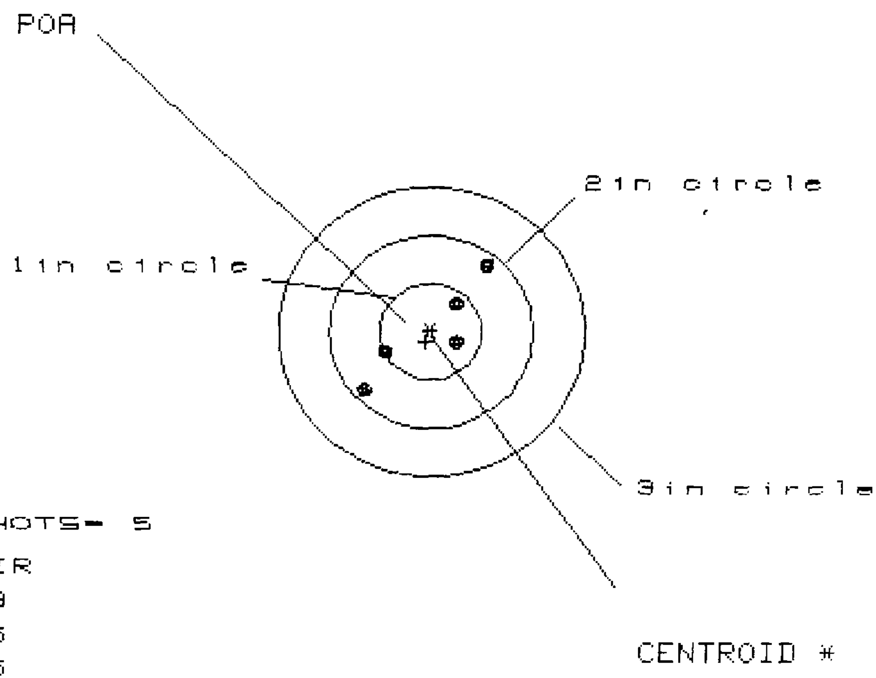
HS- 1.360
VS= 2.270
GS= 2.369

PATTERN #	:	3		
SHOTS (BEST OF)	:	5	4	3
MAXIMUM X	:	.687	.613	.310
MINIMUM X	:	-.673	-.748	-.543
MAXIMUM Y	:	1.316	.974	.805
MINIMUM Y	:	-.954	-.626	-.795
CENTROID X	:	-.125	-.050	-.255
CENTROID Y	:	.055	-.273	-.104
POA TO CENTROID in.	:	.137	.278	.275
ANGLE POA CENTROID	:	113.835	259.539	202.150
MIN RADIUS	:	.654	.634	.543
MEAN RADIUS	:	.950	.793	.745
MAX RADIUS	:	1.349	.975	.853
HORIZONTAL SPREAD	:	1.360	1.360	.853
VERTICAL SPREAD	:	2.270	1.600	1.600
EXTREME SPREAD	:	2.369	1.602	1.602

NUMBER IN ONE INCH CIRCLE	=	0
NUMBER IN TWO INCH CIRCLE	=	3
NUMBER IN THREE INCH CIRCLE	=	5

11 Mar 1988 FILE:/PATTERNING/CENTERFIRE_PATT/9478RDT

CENTERFIRE PATTERNS # 1



\# OF SHOTS= 5

\# IN CIR
1in = 3
2in = 5
3in = 5

HS= 1.161
VS= 1.223
GS= 1.686

2.227

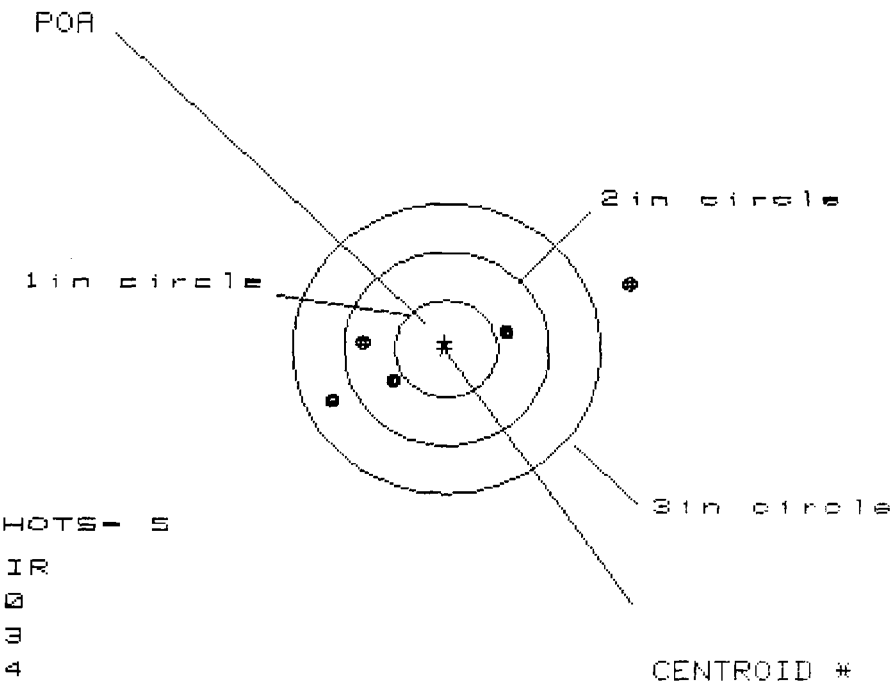
PATTERN # : 1

SHOTS (BEST OF)	:	5	4	3
MAXIMUM X	:	.543	.397	.236
MINIMUM X	:	-.618	-.482	-.457
MAXIMUM Y	:	.649	.416	.278
MINIMUM Y	:	-.574	-.412	-.166
CENTROID X	:	.052	-.084	.077
CENTROID Y	:	.102	-.060	.078
POA TO CENTROID in.	:	.115	.103	.109
ANGLE POA CENTROID	:	63.078	215.505	45.247
MIN RADIUS	:	.295	.298	.262
MEAN RADIUS	:	.562	.473	.368
MAX RADIUS	:	.846	.634	.486
HORIZONTAL SPREAD	:	1.161	.879	.693
VERTICAL SPREAD	:	1.223	.828	.444
EXTREME SPREAD	:	1.686	1.197	.810

NUMBER IN ONE INCH CIRCLE = 3
NUMBER IN TWO INCH CIRCLE = 5
NUMBER IN THREE INCH CIRCLE = 5

11 Mar 1988 FILE:/PATTERNING/CENTERFIRE_PATT/9478RDT

CENTERFIRE PATTERNS # 2



OF SHOTS= 5

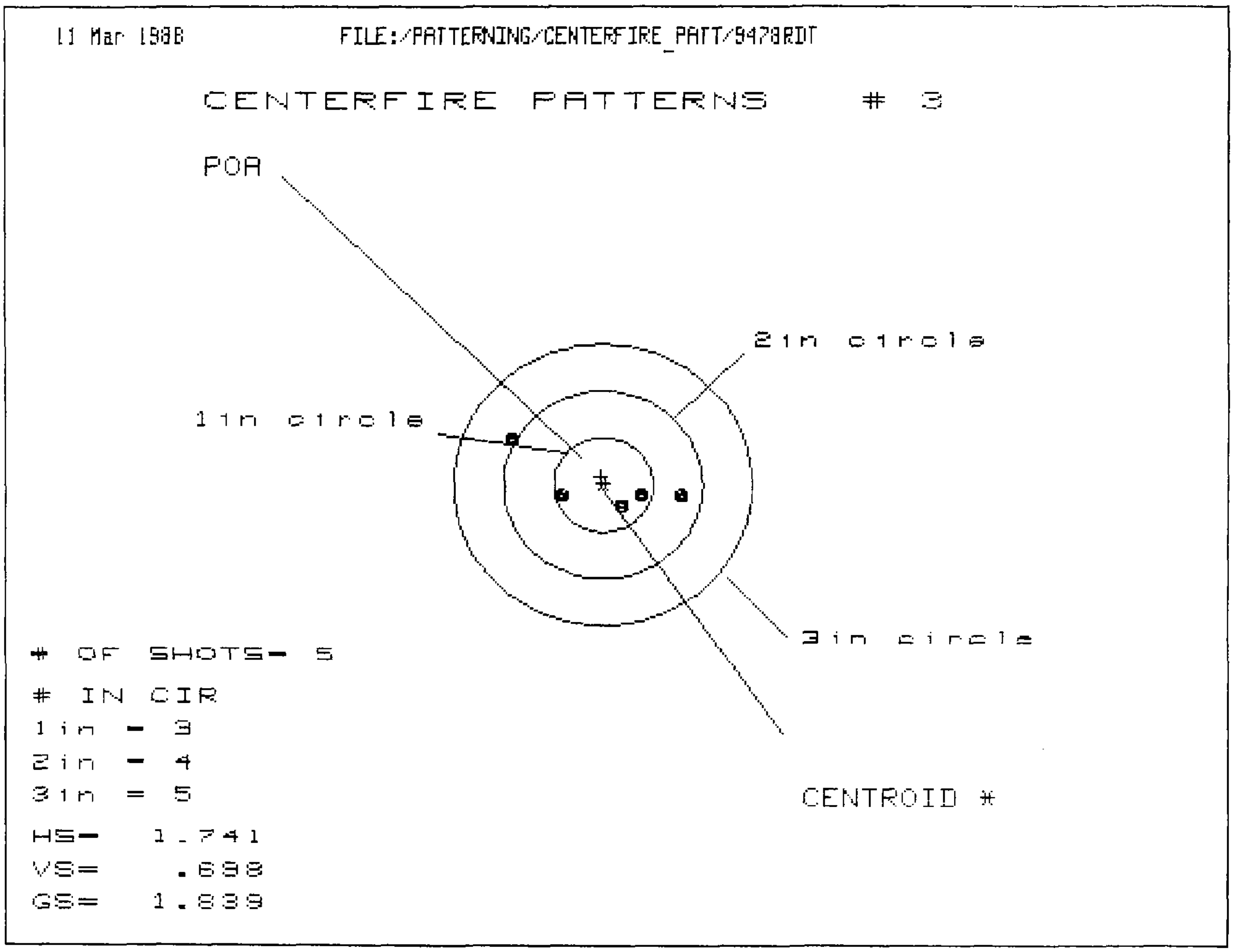
IN CIR
1 in = 0
2 in = 3
3 in = 4

HS= 2.935
VS= 1.159
GS= 3.156

PATTERN # : 2

SHOTS (BEST OF)	:	5	4	3
MAXIMUM X	:	1.830	1.015	.799
MINIMUM X	:	-1.105	-.648	-.579
MAXIMUM Y	:	.625	.308	.183
MINIMUM Y	:	-.534	-.377	-.332
CENTROID X	:	.011	-.446	-.230
CENTROID Y	:	-.072	-.229	-.103
POA TO CENTROID in.	:	.073	.501	.252
ANGLE POA CENTROID	:	351.027	207.128	204.055
MIN RADIUS	:	.578	.207	.399
MEAN RADIUS	:	1.031	.618	.605
MAX RADIUS	:	1.933	1.061	.820
HORIZONTAL SPREAD	:	2.935	1.663	1.378
VERTICAL SPREAD	:	1.159	.686	.515
EXTREME SPREAD	:	3.156	1.799	1.378

NUMBER IN ONE INCH CIRCLE = 0
NUMBER IN TWO INCH CIRCLE = 3
NUMBER IN THREE INCH CIRCLE = 4



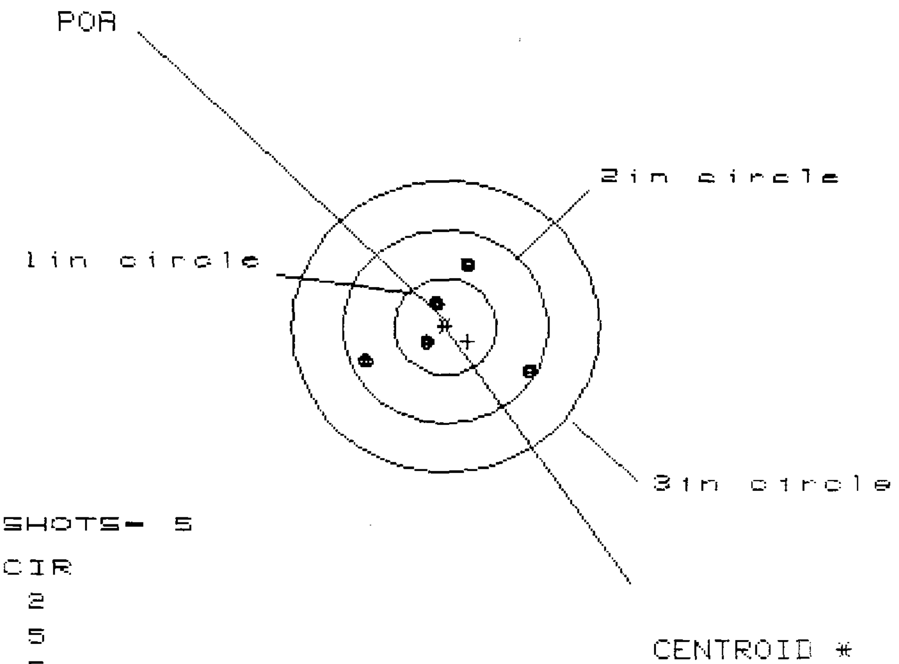
PATTERN # : 3

SHOTS (BEST OF)	:	5	4	3
MAXIMUM X	:	.813	.581	.312
MINIMUM X	:	-.928	-.605	-.411
MAXIMUM Y	:	.507	.040	.048
MINIMUM Y	:	-.191	-.065	-.051
CENTROID X	:	.018	.249	.056
CENTROID Y	:	-.087	-.213	-.227
POA TO CENTROID in.	:	.088	.328	.233
ANGLE POA CENTROID	:	348.512	310.521	346.202
MIN RADIUS	:	.235	.115	.111
MEAN RADIUS	:	.574	.356	.279
MAX RADIUS	:	1.057	.605	.413
HORIZONTAL SPREAD	:	1.741	1.186	.723
VERTICAL SPREAD	:	.698	.105	.099
EXTREME SPREAD	:	1.839	1.186	.724

NUMBER IN ONE INCH CIRCLE = 3
NUMBER IN TWO INCH CIRCLE = 4
NUMBER IN THREE INCH CIRCLE = 5

11 Mar 1988 FILE:/PATTERNING/CENTERFIRE_PATT/9562NDT

CENTERFIRE PATTERNS # 1



OF SHOTS= 5

# IN CIR
1in = 2
2in = 5
3in = 5

HS= 1.617
VS= 1.089
GS= 1.619

1,978

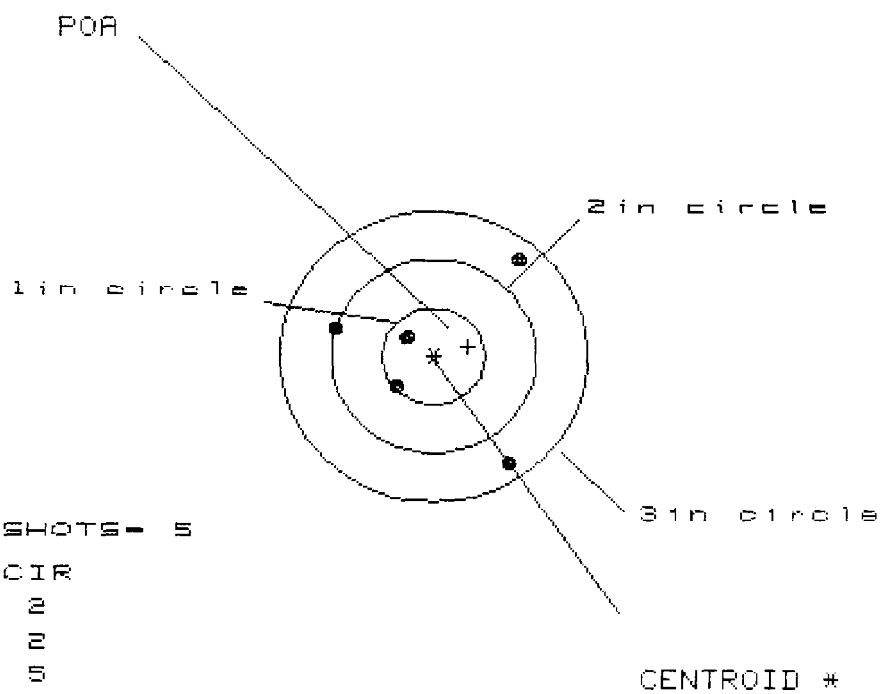
PATTERN # : **1**

SHOTS (BEST OF)	:	5	4	3
MAXIMUM X	:	.841	.447	.258
MINIMUM X	:	-.776	-.566	-.196
MAXIMUM Y	:	.651	.541	.386
MINIMUM Y	:	-.438	-.465	-.385
CENTROID X	:	-.218	-.428	-.239
CENTROID Y	:	.151	.261	.416
POA TO CENTROID in.	:	.265	.501	.479
ANGLE POA CENTROID	:	124.794	121.366	150.102
MIN RADIUS	:	.248	.199	.062
MEAN RADIUS	:	.604	.466	.319
MAX RADIUS	:	.948	.733	.465
HORIZONTAL SPREAD	:	1.617	1.013	.454
VERTICAL SPREAD	:	1.089	1.006	.771
EXTREME SPREAD	:	1.619	1.428	.895

NUMBER IN ONE INCH CIRCLE = 2
NUMBER IN TWO INCH CIRCLE = 5
NUMBER IN THREE INCH CIRCLE = 5

11 Mar 1988 FILE:/PATTERNING/CENTERFIRE_PATT/95B2NDT

CENTERFIRE PATTERNS # 2



OF SHOTS= 5

# IN CIR
1in = 2
2in = 2
3in = 5

HS= 1.832
VS= 2.100
GS= 2.212

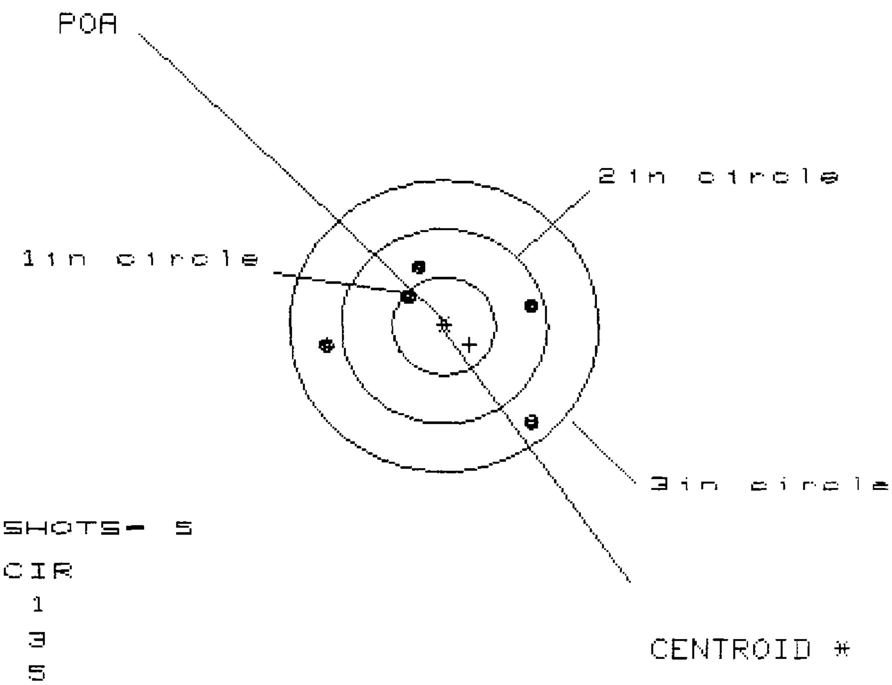
PATTERN # : 2

SHOTS (BEST OF)	:	5	4	3
MAXIMUM X	:	.845	1.026	.257
MINIMUM X	:	-.987	-.806	-.464
MAXIMUM Y	:	.953	.666	.189
MINIMUM Y	:	-1.147	-.580	-.358
CENTROID X	:	-.339	-.520	-.862
CENTROID Y	:	-.099	.188	-.034
POA TO CENTROID in.	:	.353	.553	.863
ANGLE POA CENTROID	:	196.217	109.892	182.236
MIN RADIUS	:	.355	.100	.308
MEAN RADIUS	:	.887	.681	.407
MAX RADIUS	:	1.357	1.223	.501
HORIZONTAL SPREAD	:	1.832	1.832	.721
VERTICAL SPREAD	:	2.100	1.246	.547
EXTREME SPREAD	:	2.212	1.961	.865

NUMBER IN ONE INCH CIRCLE = 2
NUMBER IN TWO INCH CIRCLE = 2
NUMBER IN THREE INCH CIRCLE = 5

11 Mar 1988 FILE:/PATTERNING/CENTERFIRE_PATT/9562NDT

CENTERFIRE PATTERNS # 3



OF SHOTS= 5

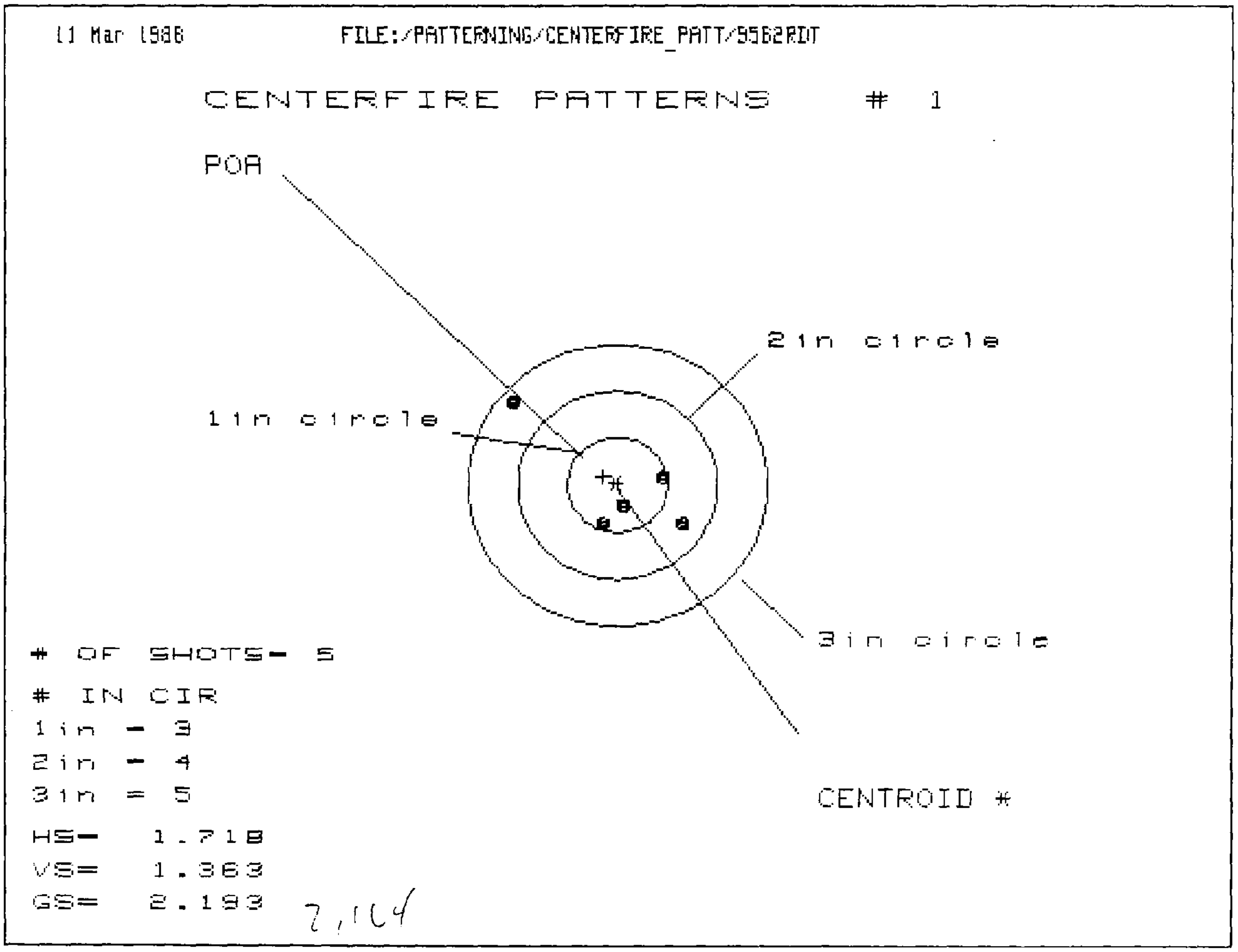
# IN CIR
1in = 1
2in = 3
3in = 5

HS= 1.977
VS= 1.565
GS= 2.104

PATTERN # : 3

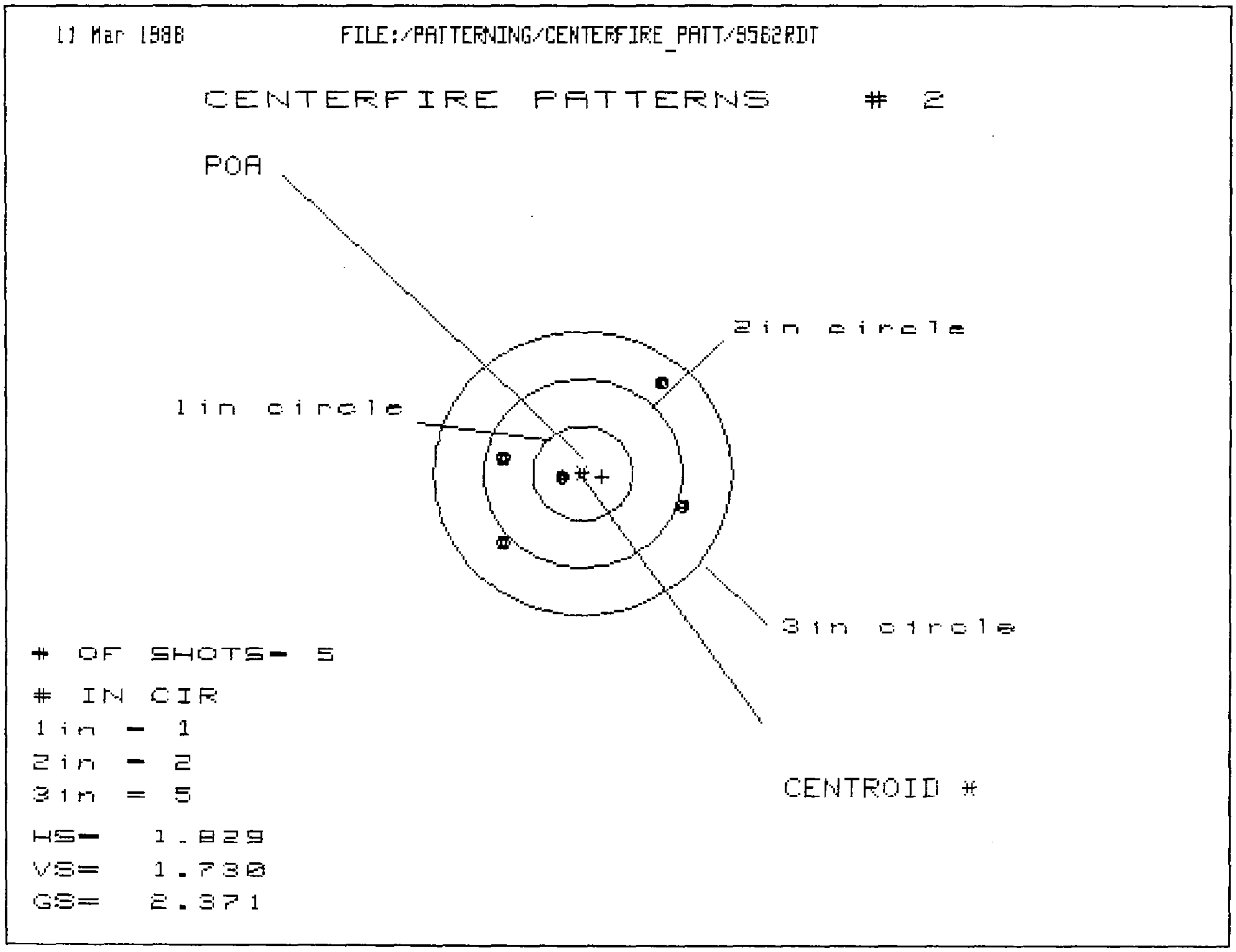
SHOTS (BEST OF)	:	5	4	3
MAXIMUM X	:	.875	1.088	.792
MINIMUM X	:	-1.102	-.889	-.470
MAXIMUM Y	:	.618	.382	.245
MINIMUM Y	:	-.947	-.410	-.135
CENTROID X	:	-.249	-.462	-.166
CENTROID Y	:	.190	.426	.563
POA TO CENTROID in.	:	.313	.629	.587
ANGLE POA CENTROID	:	127.332	132.680	163.572
MIN RADIUS	:	.468	.176	.405
MEAN RADIUS	:	.886	.656	.564
MAX RADIUS	:	1.275	1.088	.803
HORIZONTAL SPREAD	:	1.977	1.977	1.262
VERTICAL SPREAD	:	1.565	.792	.380
EXTREME SPREAD	:	2.104	2.019	1.262

NUMBER IN ONE INCH CIRCLE = 1
NUMBER IN TWO INCH CIRCLE = 3
NUMBER IN THREE INCH CIRCLE = 5



PATTERN #	:	1		
SHOTS (BEST OF)	:	5	4	3
MAXIMUM X	:	.655	.389	.306
MINIMUM X	:	-1.063	-.376	-.246
MAXIMUM Y	:	.922	.342	.272
MINIMUM Y	:	-.441	-.210	-.257
CENTROID X	:	.144	.410	.280
CENTROID Y	:	-.088	-.319	-.249
POA TO CENTROID in.	:	.169	.519	.374
ANGLE POA CENTROID	:	301.487	307.880	311.608
MIN RADIUS	:	.191	.198	.062
MEAN RADIUS	:	.655	.361	.276
MAX RADIUS	:	1.407	.442	.409
HORIZONTAL SPREAD	:	1.718	.765	.552
VERTICAL SPREAD	:	1.363	.552	.529
EXTREME SPREAD	:	2.193	.765	.765

NUMBER IN ONE INCH CIRCLE = 3
NUMBER IN TWO INCH CIRCLE = 4
NUMBER IN THREE INCH CIRCLE = 5



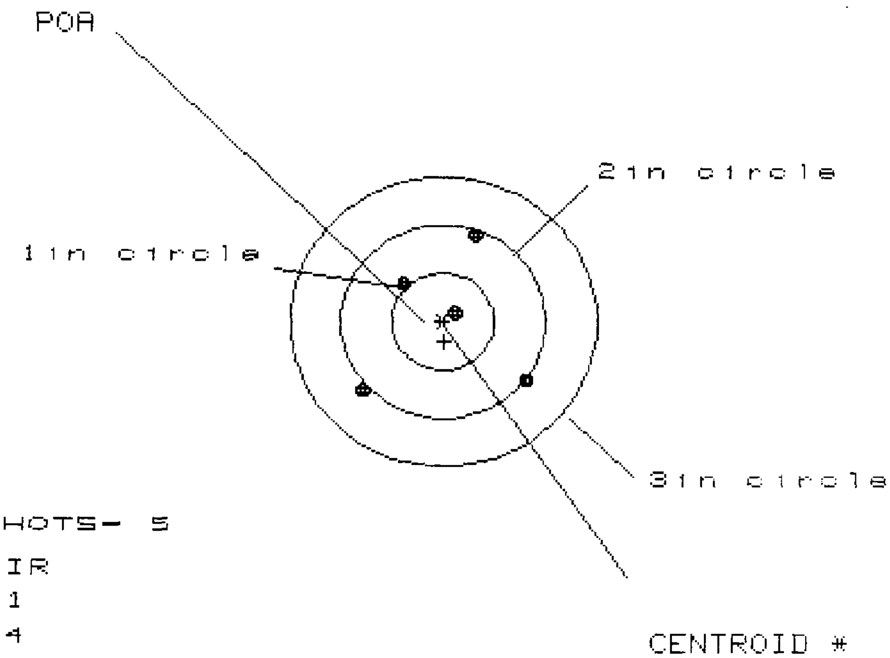
PATTERN # : 2

SHOTS (BEST OF)	:	5	4	3
MAXIMUM X	:	.990	1.197	1.000
MINIMUM X	:	-.839	-.632	-.829
MAXIMUM Y	:	1.000	.385	.225
MINIMUM Y	:	-.730	-.480	-.232
CENTROID X	:	-.198	-.405	-.208
CENTROID Y	:	.036	-.214	-.054
POA TO CENTROID in.	:	.201	.458	.215
ANGLE POA CENTROID	:	100.351	207.839	194.445
MIN RADIUS	:	.200	.170	.172
MEAN RADIUS	:	.893	.717	.686
MAX RADIUS	:	1.297	1.199	1.027
HORIZONTAL SPREAD	:	1.829	1.829	1.829
VERTICAL SPREAD	:	1.730	.865	.457
EXTREME SPREAD	:	2.371	1.885	1.885

NUMBER IN ONE INCH CIRCLE = 1
NUMBER IN TWO INCH CIRCLE = 2
NUMBER IN THREE INCH CIRCLE = 5

11 Mar 1988 FILE:/PATTERNING/CENTERFIRE_PATT/9562RDT

CENTERFIRE PATTERNS # 3



OF SHOTS- 5

IN CIR
1in - 1
2in - 4
3in = 5

HS- 1.595
VS= 1.586
GS= 1.929

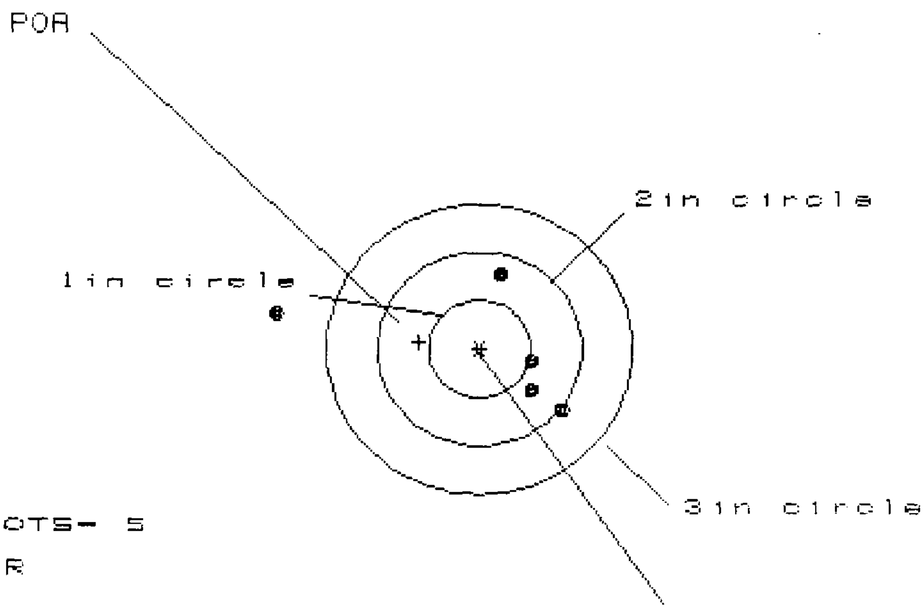
PATTERN # : 3

SHOTS (BEST OF)	:	5	4	3
MAXIMUM X	:	.777	.573	.266
MINIMUM X	:	-.818	-.570	-.379
MAXIMUM Y	:	.874	.696	.438
MINIMUM Y	:	-.712	-.773	-.392
CENTROID X	:	-.015	.190	-.001
CENTROID Y	:	.206	.384	.642
POA TO CENTROID in.	:	.207	.428	.642
ANGLE POA CENTROID	:	175.839	63.749	179.881
MIN RADIUS	:	.133	.156	.381
MEAN RADIUS	:	.730	.606	.434
MAX RADIUS	:	1.085	.962	.513
HORIZONTAL SPREAD	:	1.595	1.142	.645
VERTICAL SPREAD	:	1.586	1.469	.830
EXTREME SPREAD	:	1.929	1.551	.844

NUMBER IN ONE INCH CIRCLE = 1
NUMBER IN TWO INCH CIRCLE = 4
NUMBER IN THREE INCH CIRCLE = 5

11 Mar 1986 FILE:/PATTERNING/CENTERFIRE_PATT/9880NDT

CENTERFIRE PATTERNS # 1



OF SHOTS= 5

IN CIR

1in = 1

2in = 3

3in = 4

HS= 2.799

VS= 1.408

GS= 2.962

2.387

PATTERN #	:	1		
SHOTS (BEST OF)	:	5	4	3
MAXIMUM X	:	.799	.299	.084
MINIMUM X	:	-2.000	-.246	-.146
MAXIMUM Y	:	.792	.881	.705
MINIMUM Y	:	-.616	-.528	-.530
CENTROID X	:	-.593	1.093	.993
CENTROID Y	:	-.070	-.159	.017
POA TO CENTROID in.	:	.597	1.104	.993
ANGLE POA CENTROID	:	276.751	278.251	1.000
MIN RADIUS	:	.492	.016	.193
MEAN RADIUS	:	1.001	.473	.482
MAX RADIUS	:	2.031	.914	.720
HORIZONTAL SPREAD	:	2.799	.545	.230
VERTICAL SPREAD	:	1.408	1.408	1.235
EXTREME SPREAD	:	2.962	1.510	1.253

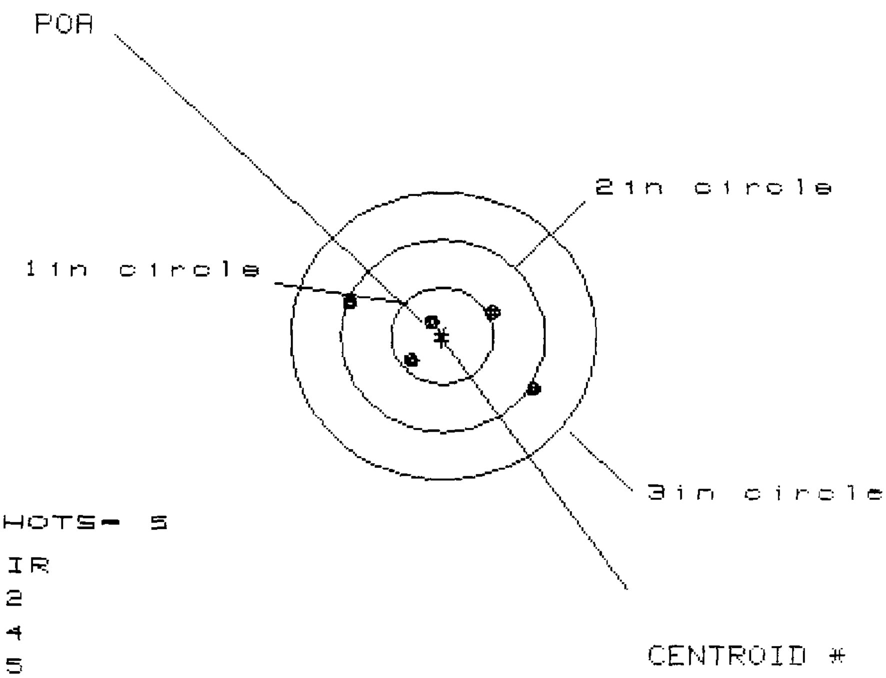
NUMBER IN ONE INCH CIRCLE = 1

NUMBER IN TWO INCH CIRCLE = 3

NUMBER IN THREE INCH CIRCLE = 4

11 Mar 1988 FILE:/PATTERNING/CENTERFIRE_PATT/98BONDT

CENTERFIRE PATTERNS # 2



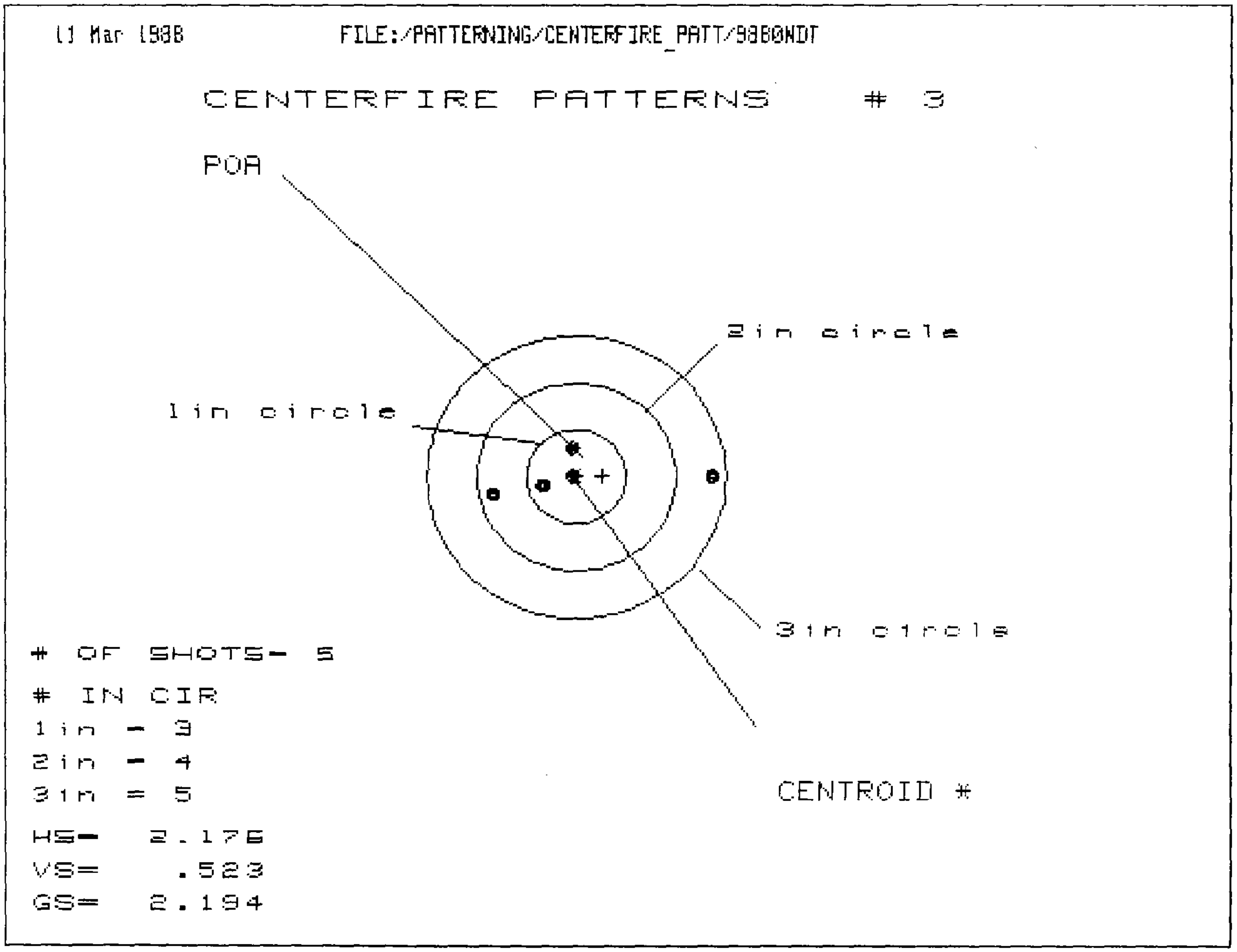
OF SHOTS= 5

# IN CIR
1in = 2
2in = 4
3in = 5

HS= 1.818
VS= .844
GS= 2.004

PATTERN #	:	2		
SHOTS (BEST OF)	:	5	4	3
MAXIMUM X	:	.897	.720	.487
MINIMUM X	:	-.921	-.697	-.333
MAXIMUM Y	:	.332	.204	.173
MINIMUM Y	:	-.512	-.354	-.285
CENTROID X	:	.009	-.215	.017
CENTROID Y	:	.049	.177	.108
POA TO CENTROID in.:		.049	.279	.110
ANGLE POA CENTROID	:	79.737	129.318	81.254
MIN RADIUS	:	.226	.089	.191
MEAN RADIUS	:	.636	.477	.382
MAX RADIUS	:	1.033	.727	.517
HORIZONTAL SPREAD	:	1.818	1.416	.820
VERTICAL SPREAD	:	.844	.558	.458
EXTREME SPREAD	:	2.004	1.420	.939

NUMBER IN ONE INCH CIRCLE = 2
NUMBER IN TWO INCH CIRCLE = 4
NUMBER IN THREE INCH CIRCLE = 5

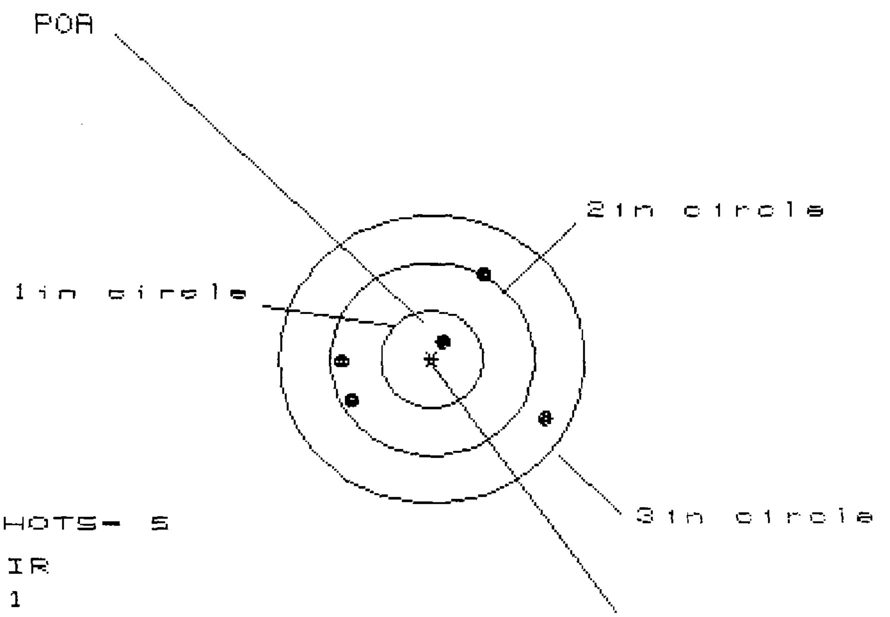


PATTERN #	:	3		
SHOTS (BEST OF)	:	5	4	3
MAXIMUM X	:	1.314	.317	.139
MINIMUM X	:	-.862	-.533	-.227
MAXIMUM Y	:	.287	.299	.225
MINIMUM Y	:	-.236	-.224	-.190
CENTROID X	:	-.263	-.592	-.414
CENTROID Y	:	-.009	-.021	.053
POA TO CENTROID in.	:	.264	.592	.418
ANGLE POA CENTROID	:	182.044	182.056	97.335
MIN RADIUS	:	.070	.126	.094
MEAN RADIUS	:	.593	.352	.218
MAX RADIUS	:	1.315	.578	.296
HORIZONTAL SPREAD	:	2.176	.850	.366
VERTICAL SPREAD	:	.523	.523	.415
EXTREME SPREAD	:	2.194	.998	.553

NUMBER IN ONE INCH CIRCLE = 3
NUMBER IN TWO INCH CIRCLE = 4
NUMBER IN THREE INCH CIRCLE = 5

11 Mar 1988 FILE:/PATTERNING/CENTERFIRE_PATT/9860RDT

CENTERFIRE PATTERNS # 1



\# OF SHOTS= 5

\# IN CIR
1in = 1
2in = 3
3in = 5

HS= 2.083
VS= 1.504
GS= 2.150

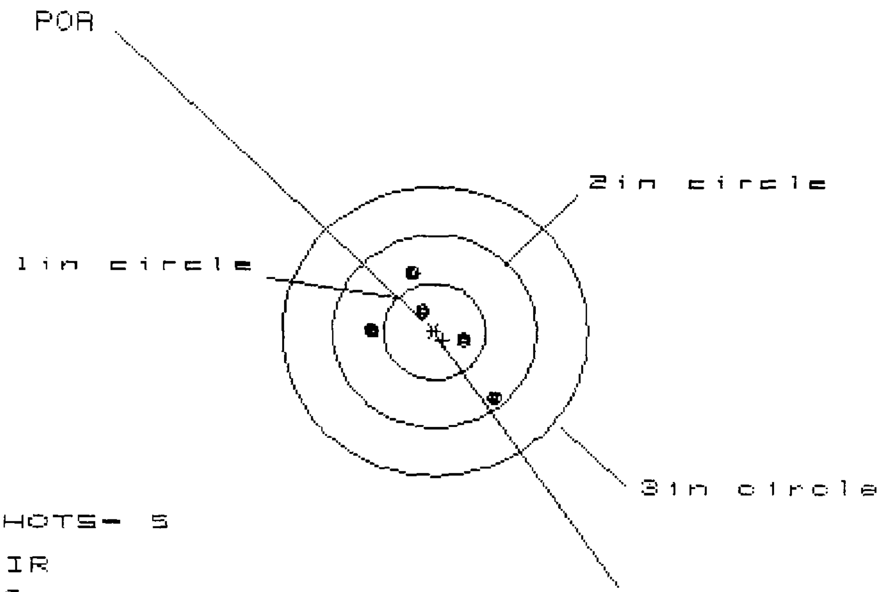
1,763

PATTERN #	:	1		
SHOTS (BEST OF)	:	5	4	3
MAXIMUM X	:	1.154	.751	.643
MINIMUM X	:	-.929	-.641	-.390
MAXIMUM Y	:	.910	.761	.287
MINIMUM Y	:	-.594	-.586	-.332
CENTROID X	:	-.111	-.399	-.650
CENTROID Y	:	-.184	-.036	-.289
POA TO CENTROID in.	:	.215	.401	.711
ANGLE POA CENTROID	:	238.945	185.081	204.006
MIN RADIUS	:	.210	.394	.393
MEAN RADIUS	:	.873	.727	.505
MAX RADIUS	:	1.298	1.070	.704
HORIZONTAL SPREAD	:	2.083	1.392	1.033
VERTICAL SPREAD	:	1.504	1.347	.619
EXTREME SPREAD	:	2.150	1.840	1.088

NUMBER IN ONE INCH CIRCLE = 1
NUMBER IN TWO INCH CIRCLE = 3
NUMBER IN THREE INCH CIRCLE = 5

11 Mar 1988 FILE:/PATTERNING/CENTERFIRE_PATT/9880RDT

CENTERFIRE PATTERNS # 2



OF SHOTS- 5

IN CIR
1in - 2
2in - 5
3in = 5

CENTROID *

HS- 1.296
VS= 1.286
GS= 1.516

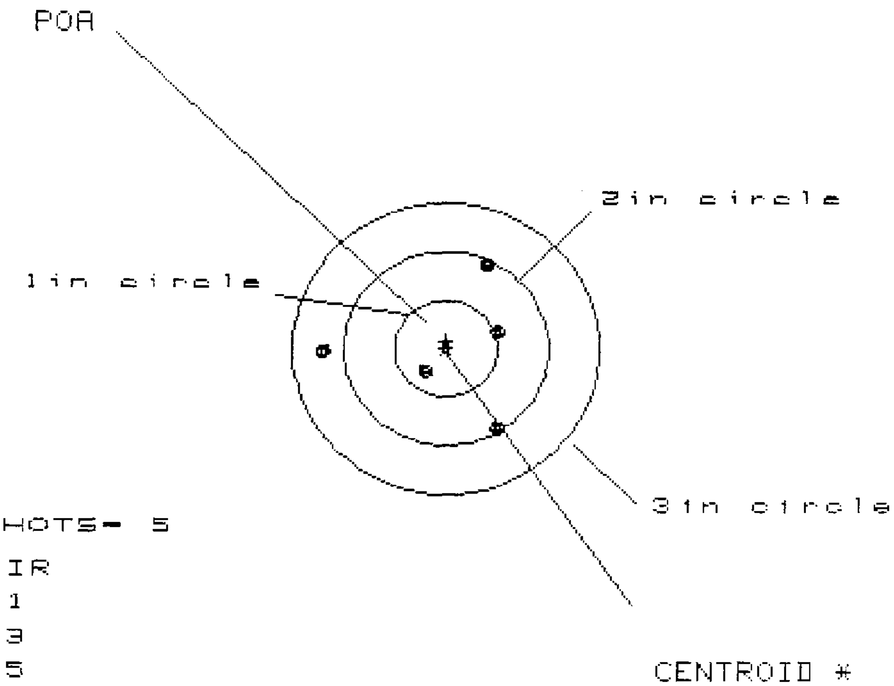
PATTERN # : 2

SHOTS (BEST OF)	:	5	4	3
MAXIMUM X	:	.631	.444	.275
MINIMUM X	:	-.665	-.508	-.184
MAXIMUM Y	:	.574	.396	.337
MINIMUM Y	:	-.712	-.238	-.297
CENTROID X	:	-.083	-.240	-.071
CENTROID Y	:	.086	.264	.323
POA TO CENTROID in.	:	.119	.357	.331
ANGLE POA CENTROID	:	136.155	137.697	167.603
MIN RADIUS	:	.212	.081	.099
MEAN RADIUS	:	.544	.380	.296
MAX RADIUS	:	.951	.538	.405
HORIZONTAL SPREAD	:	1.296	.952	.459
VERTICAL SPREAD	:	1.286	.634	.634
EXTREME SPREAD	:	1.516	.954	.783

NUMBER IN ONE INCH CIRCLE = 2
NUMBER IN TWO INCH CIRCLE = 5
NUMBER IN THREE INCH CIRCLE = 5

11 Mar 1988 FILE:/PATTERNING/CENTERFIRE_PATT/98B0RDT

CENTERFIRE PATTERNS # 3



OF SHOTS= 5

# IN CIR
1in = 1
2in = 3
3in = 5

HS= 1.761
VS= 1.748
GS= 1.924

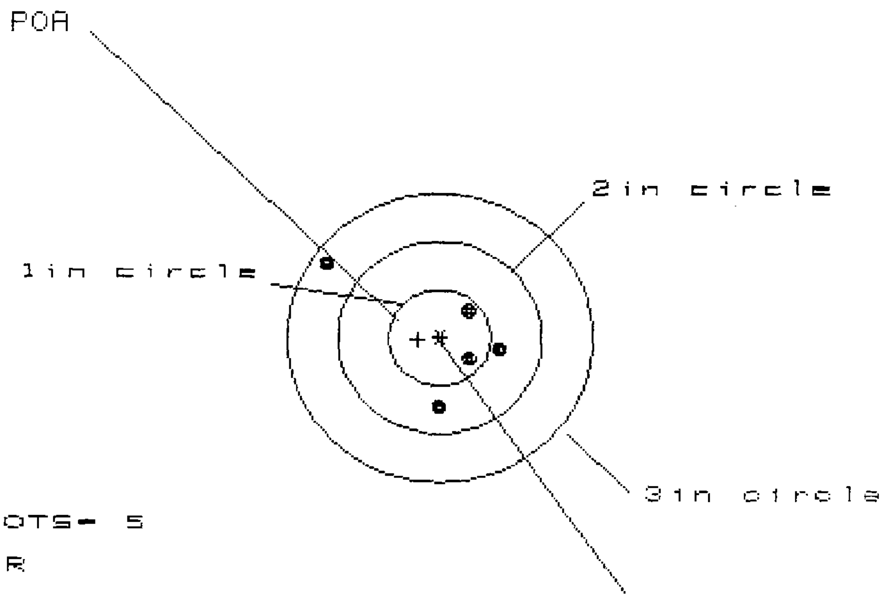
PATTERN # : 3

SHOTS (BEST OF)	:	5	4	3
MAXIMUM X	:	.514	.202	.238
MINIMUM X	:	-1.247	-.487	-.451
MAXIMUM Y	:	.918	.917	.453
MINIMUM Y	:	-.828	-.829	-.523
CENTROID X	:	-.002	.310	.274
CENTROID Y	:	-.077	-.077	-.382
POA TO CENTROID in.	:	.077	.320	.471
ANGLE POA CENTROID	:	268.803	283.851	324.340
MIN RADIUS	:	.294	.250	.457
MEAN RADIUS	:	.809	.641	.511
MAX RADIUS	:	1.247	.924	.565
HORIZONTAL SPREAD	:	1.761	.689	.689
VERTICAL SPREAD	:	1.746	1.746	.976
EXTREME SPREAD	:	1.924	1.747	.976

NUMBER IN ONE INCH CIRCLE = 1
NUMBER IN TWO INCH CIRCLE = 3
NUMBER IN THREE INCH CIRCLE = 5

11 Mar 1988 FILE:/PATTERNING/CENTERFIRE_PATT/7819NJ5

CENTERFIRE PATTERNS # 1



OF SHOTS= 5

IN CIR
1 in = 2
2 in = 4
3 in = 5

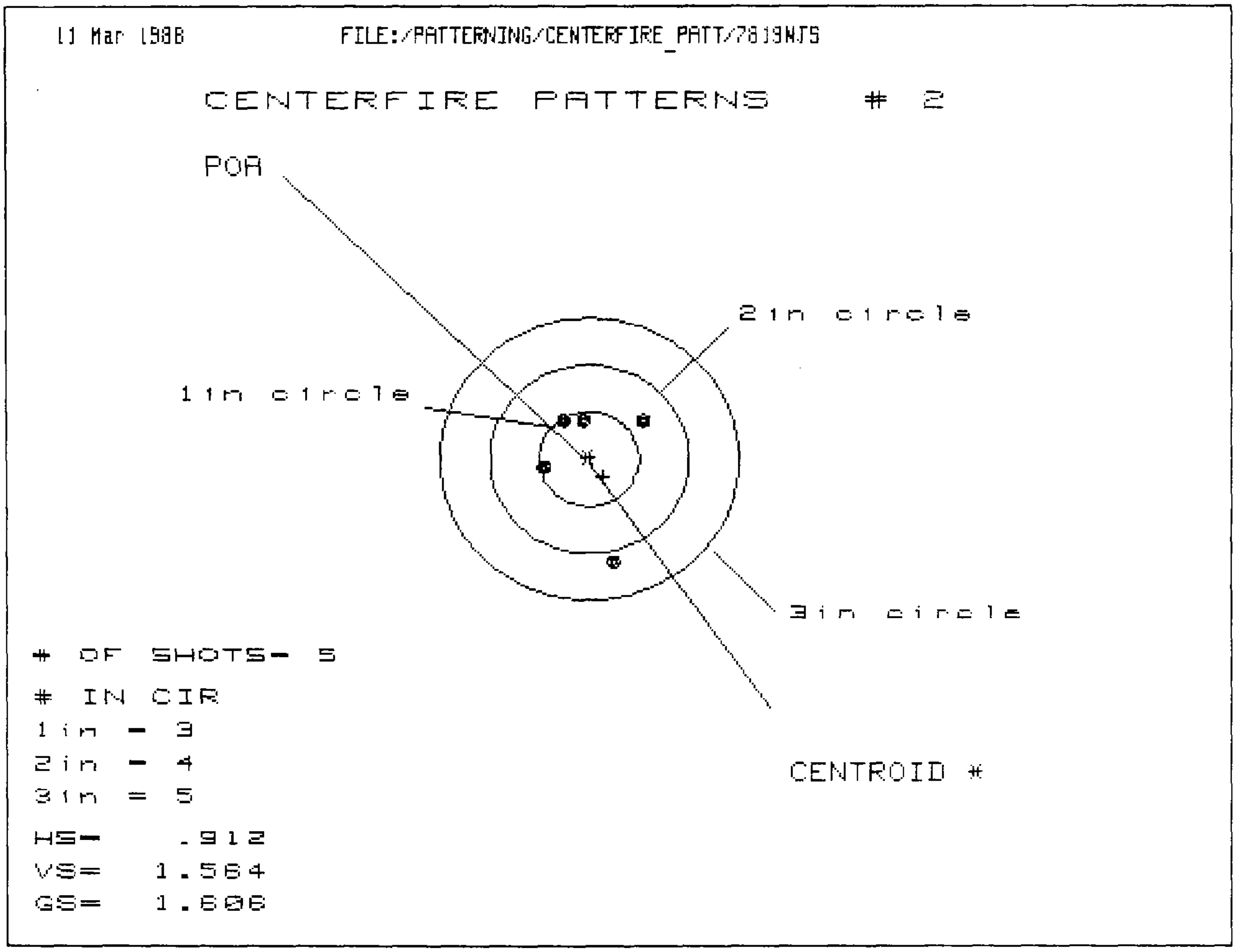
HS= 1.754
VS= 1.454
GS= 1.951

2.695

PATTERN # : 1

SHOTS (BEST OF)	:	5	4	3
MAXIMUM X	:	.619	.335	.241
MINIMUM X	:	-1.135	-.282	-.128
MAXIMUM Y	:	.739	.472	.296
MINIMUM Y	:	-.715	-.530	-.189
CENTROID X	:	.213	.497	.591
CENTROID Y	:	.018	-.167	.009
POA TO CENTROID in.	:	.214	.524	.591
ANGLE POA CENTROID	:	4.719	288.599	.905
MIN RADIUS	:	.330	.023	.220
MEAN RADIUS	:	.682	.360	.269
MAX RADIUS	:	1.355	.600	.322
HORIZONTAL SPREAD	:	1.754	.617	.369
VERTICAL SPREAD	:	1.454	1.002	.485
EXTREME SPREAD	:	1.951	1.032	.546

NUMBER IN ONE INCH CIRCLE = 2
NUMBER IN TWO INCH CIRCLE = 4
NUMBER IN THREE INCH CIRCLE = 5

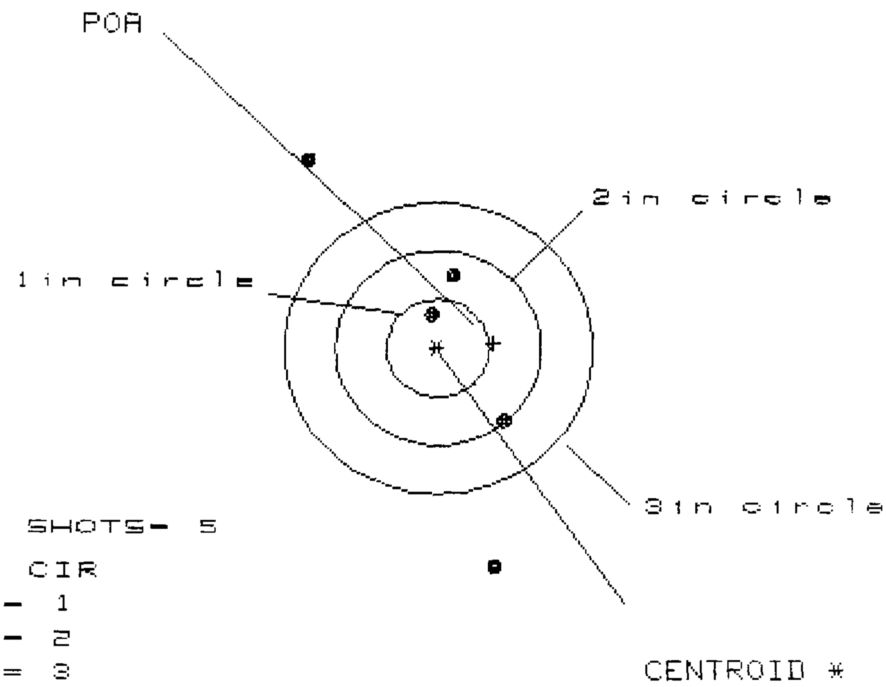


PATTERN #	:	2		
SHOTS (BEST OF)	:	5	4	3
MAXIMUM X	:	.505	.571	.157
MINIMUM X	:	-.407	-.341	-.151
MAXIMUM Y	:	.429	.145	.185
MINIMUM Y	:	-1.135	-.356	-.316
CENTROID X	:	-.143	-.209	-.399
CENTROID Y	:	.188	.472	.432
POA TO CENTROID in.	:	.236	.516	.589
ANGLE POA CENTROID	:	142.771	156.116	137.272
MIN RADIUS	:	.413	.149	.132
MEAN RADIUS	:	.625	.361	.242
MAX RADIUS	:	1.165	.583	.350
HORIZONTAL SPREAD	:	.912	.912	.308
VERTICAL SPREAD	:	1.564	.501	.501
EXTREME SPREAD	:	1.606	1.028	.588

NUMBER IN ONE INCH CIRCLE = 3
NUMBER IN TWO INCH CIRCLE = 4
NUMBER IN THREE INCH CIRCLE = 5

11 Mar 1988 FILE:/PATTERNING/CENTERFIRE_PATT/7819NJS

CENTERFIRE PATTERNS # 3



OF SHOTS= 5
IN CIR
1 in - 1
2 in - 2
3 in = 3
HS= 1.877
VS= 4.173
GS= 4.528

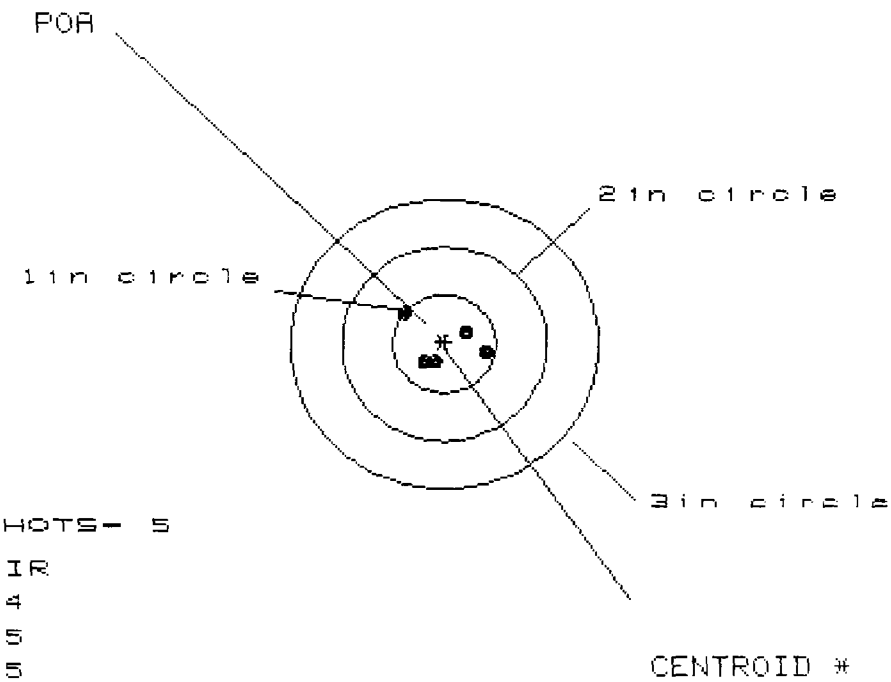
PATTERN # : 3

SHOTS (BEST OF)	:	5	4	3
MAXIMUM X	:	.639	.768	.399
MINIMUM X	:	-1.238	-1.109	-.297
MAXIMUM Y	:	1.931	1.371	.618
MINIMUM Y	:	-2.242	-1.331	-.874
CENTROID X	:	-.541	-.670	-.301
CENTROID Y	:	-.049	.511	.054
POA TO CENTROID in.	:	.543	.843	.306
ANGLE POA CENTROID	:	185.221	127.312	100.171
MIN RADIUS	:	.364	.214	.392
MEAN RADIUS	:	1.339	.956	.660
MAX RADIUS	:	2.301	1.763	.961
HORIZONTAL SPREAD	:	1.877	1.877	.696
VERTICAL SPREAD	:	4.173	2.702	1.492
EXTREME SPREAD	:	4.528	3.290	1.574

NUMBER IN ONE INCH CIRCLE = 1
NUMBER IN TWO INCH CIRCLE = 2
NUMBER IN THREE INCH CIRCLE = 3

11 Mar 1988 FILE:/PATTERNING/CENTERFIRE_PATT/7819RJS

CENTERFIRE PATTERNS # 1



OF SHOTS- 5

IN CIR
1 in - 4
2 in - 5
3 in = 5

HS- .785
VS= .544
GS= .916

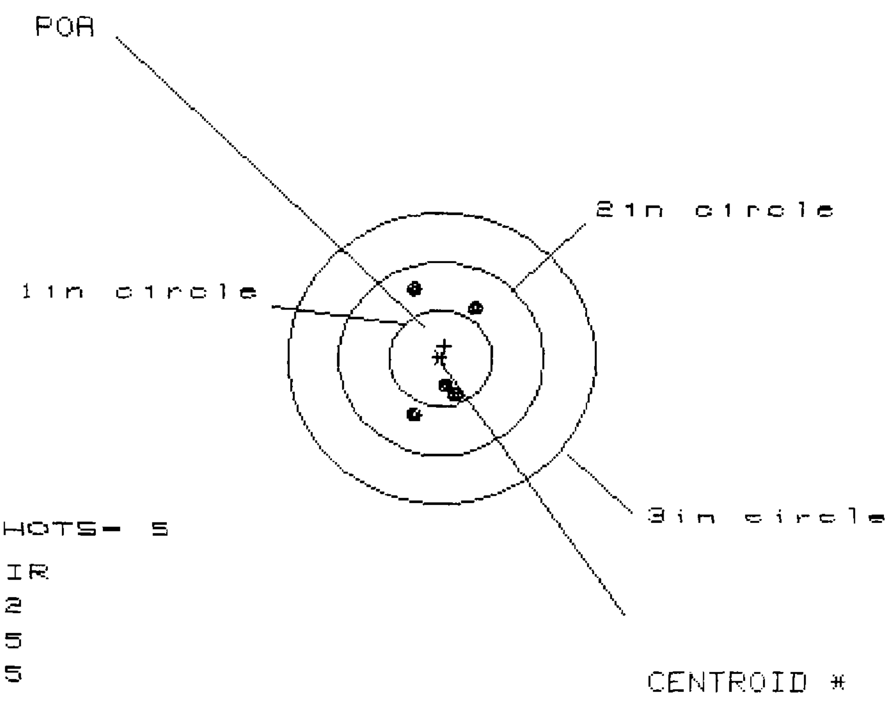
1.581

PATTERN #	:	1		
SHOTS (BEST OF)	:	5	4	3
MAXIMUM X	:	.431	.342	.202
MINIMUM X	:	-.354	-.257	-.143
MAXIMUM Y	:	.359	.164	.156
MINIMUM Y	:	-.185	-.095	-.103
CENTROID X	:	-.010	.079	-.035
CENTROID Y	:	-.019	-.109	-.101
POA TO CENTROID in.	:	.022	.134	.107
ANGLE POA CENTROID	:	242.959	324.153	250.777
MIN RADIUS	:	.160	.180	.080
MEAN RADIUS	:	.310	.246	.171
MAX RADIUS	:	.504	.343	.256
HORIZONTAL SPREAD	:	.785	.599	.345
VERTICAL SPREAD	:	.544	.259	.259
EXTREME SPREAD	:	.916	.603	.431

NUMBER IN ONE INCH CIRCLE = 4
NUMBER IN TWO INCH CIRCLE = 5
NUMBER IN THREE INCH CIRCLE = 5

11 Mar 1988 FILE:/PATTERNING/CENTERFIRE_PATT/7819RJS

CENTERFIRE PATTERNS # 2



\# OF SHOTS= 5

\# IN CIR
1in = 2
2in = 5
3in = 5

HS= .618
VS= 1.289
GS= 1.290

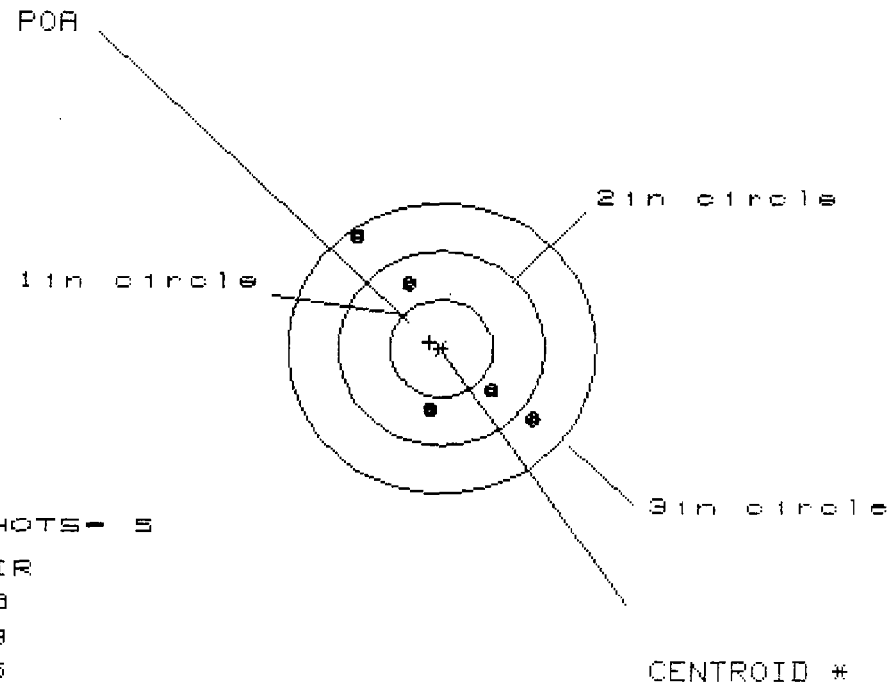
PATTERN # : 2

SHOTS (BEST OF)	:	5	4	3
MAXIMUM X	:	.339	.280	.168
MINIMUM X	:	-.279	-.338	-.168
MAXIMUM Y	:	.748	.686	.568
MINIMUM Y	:	-.541	-.354	-.345
CENTROID X	:	-.037	.022	.134
CENTROID Y	:	-.127	-.314	-.196
POA TO CENTROID in.	:	.133	.315	.238
ANGLE POA CENTROID	:	253.698	356.041	325.620
MIN RADIUS	:	.293	.120	.280
MEAN RADIUS	:	.547	.401	.406
MAX RADIUS	:	.784	.741	.593
HORIZONTAL SPREAD	:	.618	.618	.336
VERTICAL SPREAD	:	1.289	1.040	.913
EXTREME SPREAD	:	1.290	1.210	.928

NUMBER IN ONE INCH CIRCLE = 2
NUMBER IN TWO INCH CIRCLE = 5
NUMBER IN THREE INCH CIRCLE = 5

11 Mar 1988 FILE:/PATTERNING/CENTERFIRE_PATT/7813RJS

CENTERFIRE PATTERNS # 3



OF SHOTS= 5

IN CIR

1in = 0

2in = 3

3in = 5

HS= 1.664

VS= 1.914

GS= 2.536

PATTERN # : 3

SHOTS (BEST OF)	:	5	4	3
MAXIMUM X	:	.858	.657	.482
MINIMUM X	:	-.806	-.565	-.346
MAXIMUM Y	:	1.144	.988	.827
MINIMUM Y	:	-.770	-.484	-.525
CENTROID X	:	.116	.317	.098
CENTROID Y	:	-.068	-.354	-.193
POA TO CENTROID in.	:	.134	.476	.217
ANGLE POA CENTROID	:	300.496	318.154	333.001
MIN RADIUS	:	.631	.298	.542
MEAN RADIUS	:	.928	.690	.669
MAX RADIUS	:	1.399	1.138	.897
HORIZONTAL SPREAD	:	1.664	1.222	.828
VERTICAL SPREAD	:	1.914	1.472	1.352
EXTREME SPREAD	:	2.536	1.913	1.400

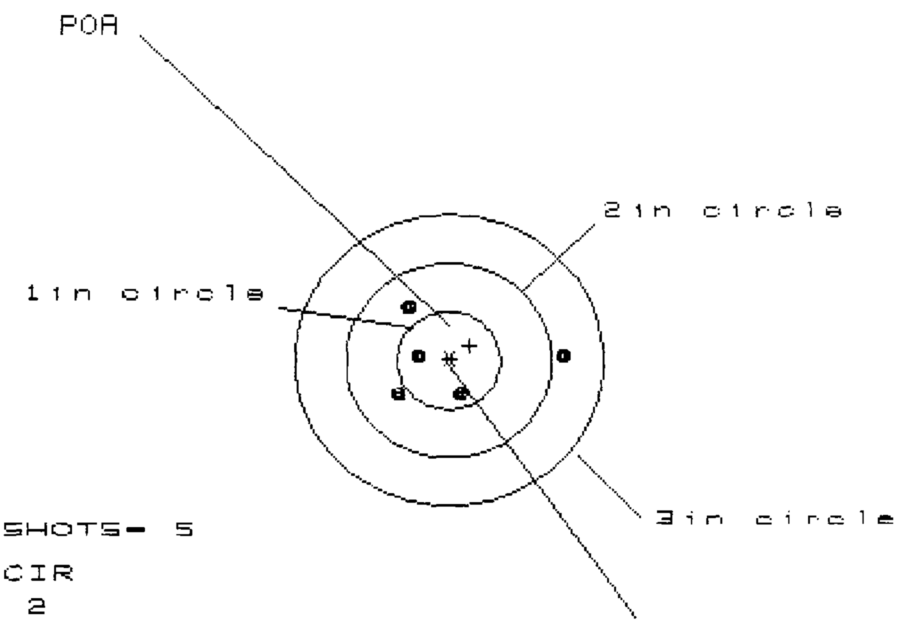
NUMBER IN ONE INCH CIRCLE = 0

NUMBER IN TWO INCH CIRCLE = 3

NUMBER IN THREE INCH CIRCLE = 5

11 Mar 1988 FILE:/PATTERNING/CENTERFIRE_PATT/5548NJS

CENTERFIRE PATTERNS # 1



OF SHOTS= 5

IN CIR

1 in = 2

2 in = 4

3 in = 5

HS= 1.575

VS= .931

GS= 1.627

1.438

PATTERN #	:	1		
SHOTS (BEST OF)	:	5	4	3
MAXIMUM X	:	1.074	.414	.361
MINIMUM X	:	-.501	-.233	-.286
MAXIMUM Y	:	.562	.572	.291
MINIMUM Y	:	-.369	-.359	-.169
CENTROID X	:	-.207	-.475	-.422
CENTROID Y	:	-.156	-.166	-.356
POA TO CENTROID in.	:	.259	.503	.552
ANGLE POA CENTROID	:	216.958	199.227	220.177
MIN RADIUS	:	.304	.103	.301
MEAN RADIUS	:	.612	.411	.338
MAX RADIUS	:	1.075	.594	.381
HORIZONTAL SPREAD	:	1.575	.647	.647
VERTICAL SPREAD	:	.931	.931	.460
EXTREME SPREAD	:	1.627	1.055	.649

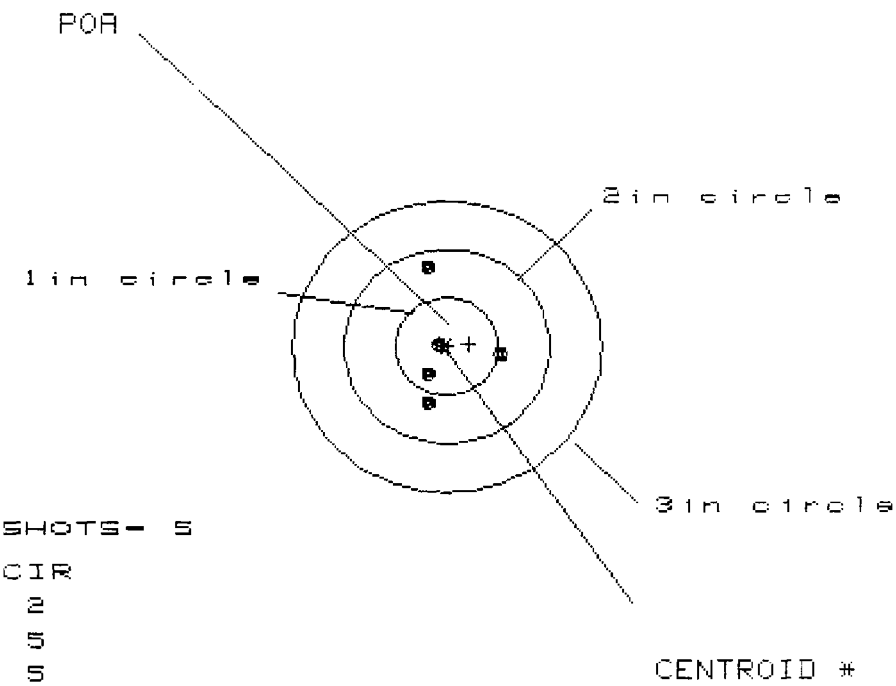
NUMBER IN ONE INCH CIRCLE = 2

NUMBER IN TWO INCH CIRCLE = 4

NUMBER IN THREE INCH CIRCLE = 5

11 Mar 1998 FILE:/PATTERNING/CENTERFIRE_PATT/9548NJS

CENTERFIRE PATTERNS # 2



OF SHOTS= 5

# IN CIR
1in = 2
2in = 5
3in = 5

HS= .756
VS= 1.471
GS= 1.473

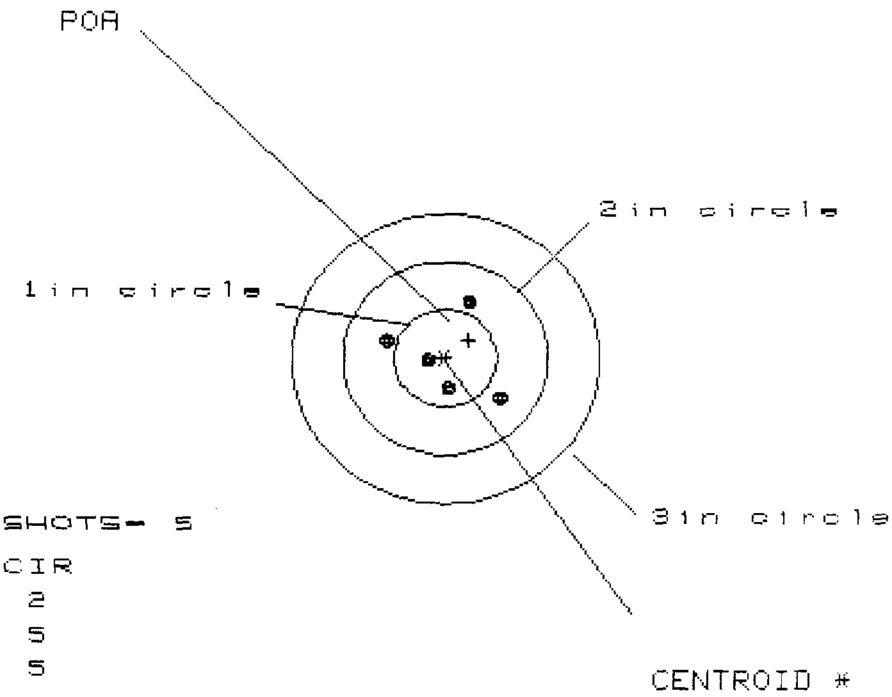
PATTERN # : 2

SHOTS (BEST OF)	:	5	4	3
MAXIMUM X	:	.542	.489	.423
MINIMUM X	:	-.214	-.198	-.251
MAXIMUM Y	:	.857	.280	.146
MINIMUM Y	:	-.614	-.400	-.159
CENTROID X	:	-.218	-.165	-.099
CENTROID Y	:	-.026	-.240	-.106
POA TO CENTROID in.	:	.220	.291	.145
ANGLE POA CENTROID	:	186.685	235.464	227.045
MIN RADIUS	:	.084	.187	.226
MEAN RADIUS	:	.484	.361	.315
MAX RADIUS	:	.883	.510	.423
HORIZONTAL SPREAD	:	.756	.687	.674
VERTICAL SPREAD	:	1.471	.680	.305
EXTREME SPREAD	:	1.473	.878	.695

NUMBER IN ONE INCH CIRCLE = 2
NUMBER IN TWO INCH CIRCLE = 5
NUMBER IN THREE INCH CIRCLE = 5

11 Mar 1988 FILE:/PATTERNING/CENTERFIRE_PATT/9549MJS

CENTERFIRE PATTERNS # 3



\# OF SHOTS= 5

\# IN CIR
1in = 2
2in = 5
3in = 5

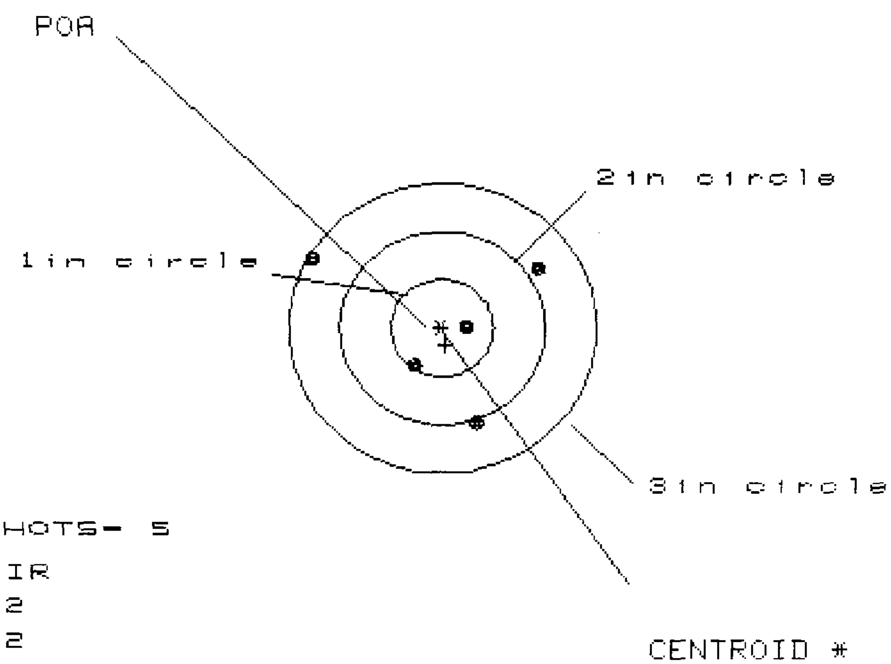
HS= 1.080
VS= .944
GS= 1.215

PATTERN #	:	3		
SHOTS (BEST OF)	:	5	4	3
MAXIMUM X	:	.497	.336	.183
MINIMUM X	:	-.583	-.459	-.190
MAXIMUM Y	:	.560	.464	.489
MINIMUM Y	:	-.384	-.394	-.369
CENTROID X	:	-.231	-.355	-.202
CENTROID Y	:	-.186	-.089	-.115
POA TO CENTROID in.	:	.296	.366	.233
ANGLE POA CENTROID	:	218.781	194.141	209.541
MIN RADIUS	:	.168	.149	.224
MEAN RADIUS	:	.461	.403	.372
MAX RADIUS	:	.628	.573	.522
HORIZONTAL SPREAD	:	1.080	.795	.373
VERTICAL SPREAD	:	.944	.858	.858
EXTREME SPREAD	:	1.215	.885	.876

NUMBER IN ONE INCH CIRCLE = 2
NUMBER IN TWO INCH CIRCLE = 5
NUMBER IN THREE INCH CIRCLE = 5

11 Mar 1988 FILE:/PATTERNING/CENTERFIRE_PATT/9548RJS

CENTERFIRE PATTERNS # 1



\# OF SHOTS= 5

\# IN CIR
1in = 2
2in = 2
3in = 5

HS= 2.177
VS= 1.675
GS= 2.265

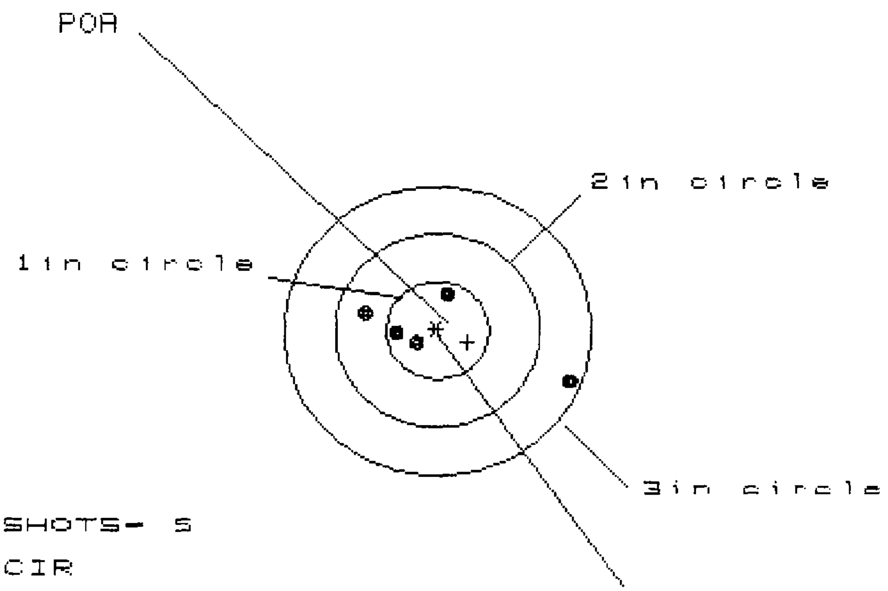
2.165

PATTERN #	:	1		
SHOTS (BEST OF)	:	5	4	3
MAXIMUM X	:	.951	.644	.206
MINIMUM X	:	-1.226	-.559	-.344
MAXIMUM Y	:	.702	.807	.435
MINIMUM Y	:	-.973	-.797	-.528
CENTROID X	:	-.034	.273	.058
CENTROID Y	:	.183	.007	-.262
POA TO CENTROID in.	:	.186	.273	.268
ANGLE POA CENTROID	:	169.513	1.470	347.518
MIN RADIUS	:	.230	.183	.356
MEAN RADIUS	:	.847	.650	.460
MAX RADIUS	:	1.413	1.033	.567
HORIZONTAL SPREAD	:	2.177	1.203	.550
VERTICAL SPREAD	:	1.675	1.604	.963
EXTREME SPREAD	:	2.265	1.732	.965

NUMBER IN ONE INCH CIRCLE = 2
NUMBER IN TWO INCH CIRCLE = 2
NUMBER IN THREE INCH CIRCLE = 5

11 Mar 1988 FILE:/PATTERNING/CENTERFIRE_PATT/9548RJS

CENTERFIRE PATTERNS # 2



OF SHOTS= 5
IN CIR
1in - 3
2in - 4
3in = 5

HS= 2.000
VS= .897
GS= 2.121

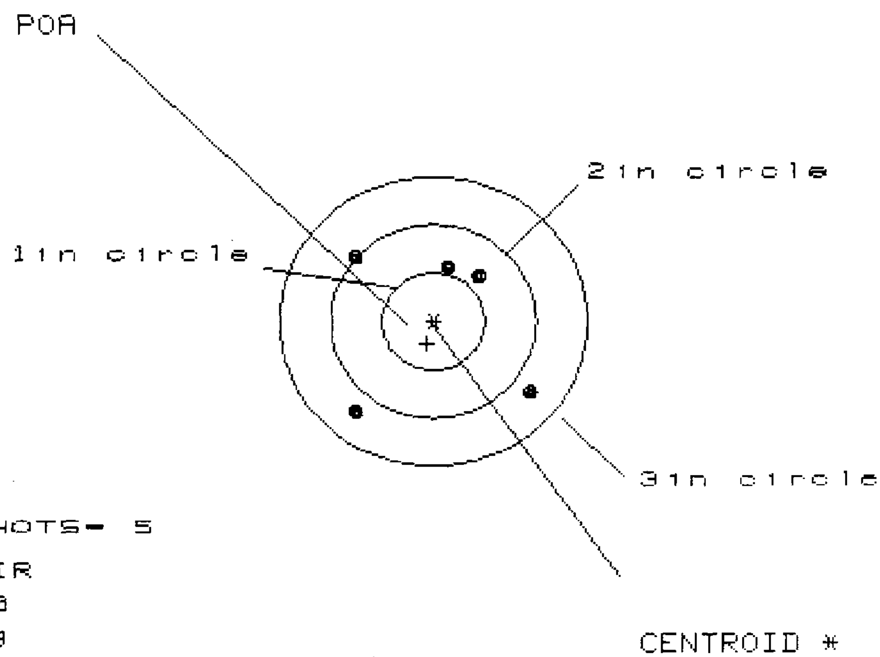
PATTERN # : 2

SHOTS (BEST OF)	:	5	4	3
MAXIMUM X	:	1.257	.377	.234
MINIMUM X	:	-.743	-.429	-.228
MAXIMUM Y	:	.410	.288	.321
MINIMUM Y	:	-.487	-.199	-.166
CENTROID X	:	-.297	-.611	-.468
CENTROID Y	:	.119	.241	.208
POA TO CENTROID in.	:	.320	.656	.512
ANGLE POA CENTROID	:	111.861	111.514	114.012
MIN RADIUS	:	.192	.205	.166
MEAN RADIUS	:	.627	.340	.280
MAX RADIUS	:	1.348	.474	.397
HORIZONTAL SPREAD	:	2.000	.806	.462
VERTICAL SPREAD	:	.897	.487	.487
EXTREME SPREAD	:	2.121	.828	.663

NUMBER IN ONE INCH CIRCLE = 3
NUMBER IN TWO INCH CIRCLE = 4
NUMBER IN THREE INCH CIRCLE = 5

11 Mar 1988 FILE:/PATTERNING/CENTERFIRE_PATT/9548RJS

CENTERFIRE PATTERNS # 3



\# OF SHOTS= 5

\# IN CIR
1in = 0
2in = 3
3in = 5

HS= 1.683
VS= 1.578
GS= 2.108 2.165

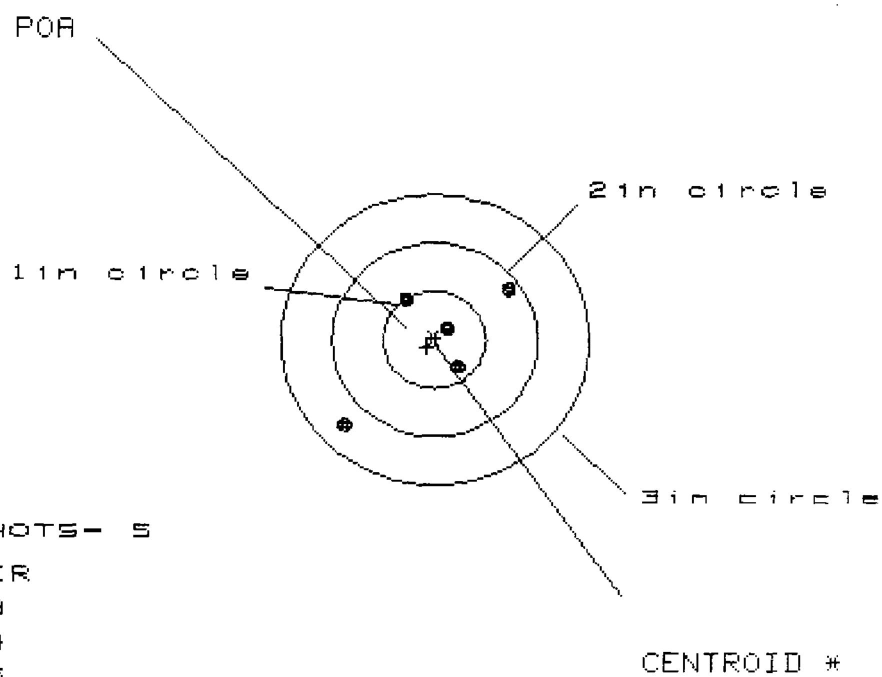
PATTERN # : 3

SHOTS (BEST OF)	:	5	4	3
MAXIMUM X	:	.912	.719	.489
MINIMUM X	:	-.771	-.916	-.677
MAXIMUM Y	:	.647	.414	.109
MINIMUM Y	:	-.931	-.916	-.105
CENTROID X	:	.059	.252	.013
CENTROID Y	:	.230	.463	.768
POA TO CENTROID in.	:	.238	.527	.768
ANGLE POA CENTROID	:	75.531	61.418	89.056
MIN RADIUS	:	.553	.306	.187
MEAN RADIUS	:	.898	.699	.458
MAX RADIUS	:	1.209	1.164	.685
HORIZONTAL SPREAD	:	1.683	1.635	1.166
VERTICAL SPREAD	:	1.578	1.330	.214
EXTREME SPREAD	:	2.108	2.108	1.185

NUMBER IN ONE INCH CIRCLE = 0
NUMBER IN TWO INCH CIRCLE = 3
NUMBER IN THREE INCH CIRCLE = 5

11 Mar 1988 FILE:/PATTERNING/CENTERFIRE_PATT/9854NJS

CENTERFIRE PATTERNS # 1



OF SHOTS- 5

IN CIR
1in - 3
2in - 4
3in = 5

HS- 1.588
VS= 1.427
GS= 2.135

2.439

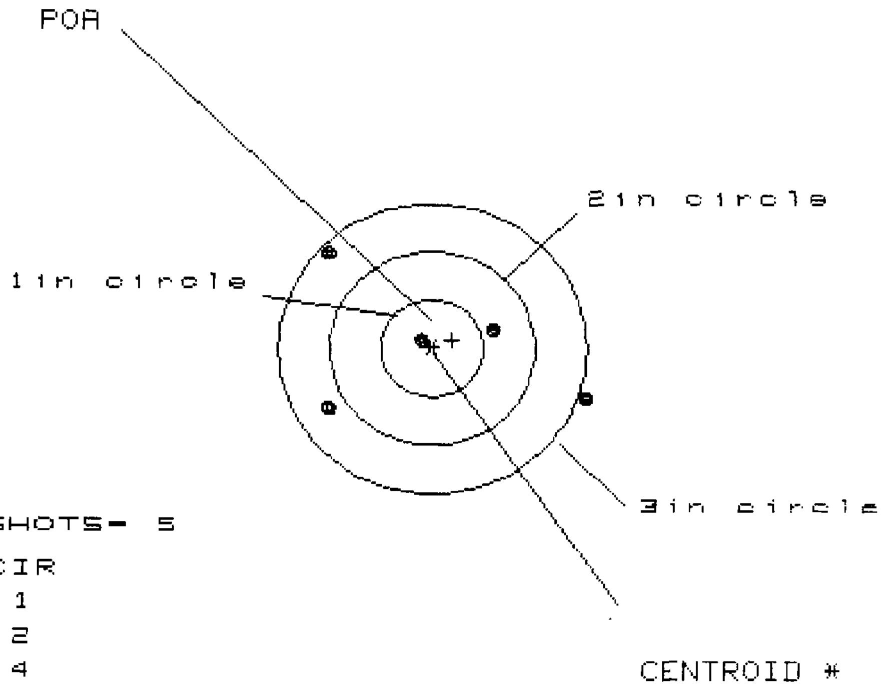
PATTERN # : 1

SHOTS (BEST OF)	:	5	4	3
MAXIMUM X	:	.759	.551	.150
MINIMUM X	:	-.829	-.447	-.263
MAXIMUM Y	:	.550	.331	.314
MINIMUM Y	:	-.877	-.456	-.345
CENTROID X	:	.076	.283	.100
CENTROID Y	:	.077	.296	.185
POA TO CENTROID in.	:	.108	.410	.210
ANGLE POA CENTROID	:	45.150	46.212	61.730
MIN RADIUS	:	.195	.106	.117
MEAN RADIUS	:	.624	.424	.301
MAX RADIUS	:	1.207	.643	.409
HORIZONTAL SPREAD	:	1.588	.998	.413
VERTICAL SPREAD	:	1.427	.787	.659
EXTREME SPREAD	:	2.135	1.006	.778

NUMBER IN ONE INCH CIRCLE = 3
NUMBER IN TWO INCH CIRCLE = 4
NUMBER IN THREE INCH CIRCLE = 5

11 Mar 1988 FILE:/PATTERNING/CENTERFIRE_PATT/9854NJS

CENTERFIRE PATTERNS # 2



OF SHOTS= 5

IN CIR
1in - 1
2in - 2
3in = 4

HS= 2.517
VS= 1.608
GS= 2.902

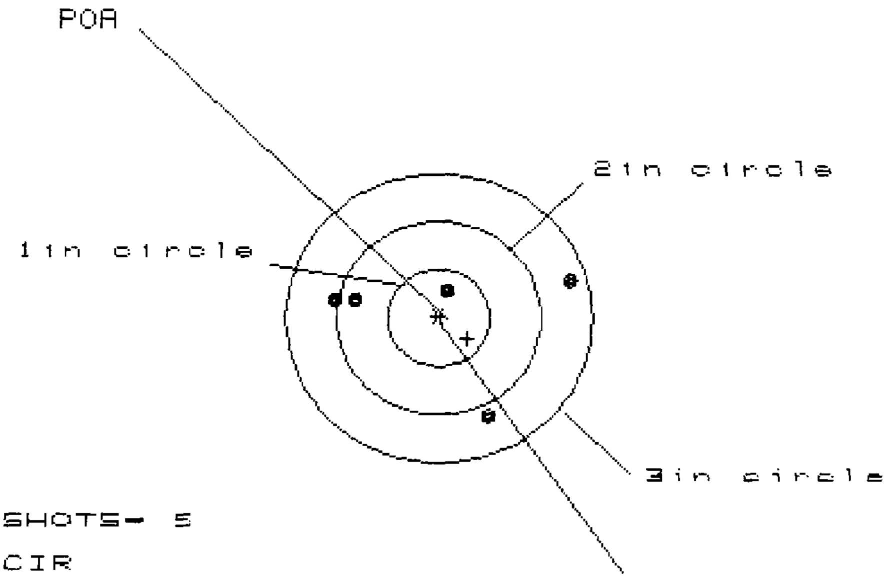
PATTERN # : 2

SHOTS (BEST OF)	:	5	4	3
MAXIMUM X	:	1.509	1.002	.802
MINIMUM X	:	-1.008	-.631	-.831
MAXIMUM Y	:	.963	.829	.286
MINIMUM Y	:	-.645	-.779	-.503
CENTROID X	:	-.195	-.572	-.372
CENTROID Y	:	-.088	.046	-.230
POA TO CENTROID in.	:	.214	.574	.438
ANGLE POA CENTROID	:	204.191	94.621	211.705
MIN RADIUS	:	.167	.236	.219
MEAN RADIUS	:	.996	.816	.681
MAX RADIUS	:	1.601	1.023	.971
HORIZONTAL SPREAD	:	2.517	1.633	1.633
VERTICAL SPREAD	:	1.608	1.608	.789
EXTREME SPREAD	:	2.902	1.814	1.814

NUMBER IN ONE INCH CIRCLE = 1
NUMBER IN TWO INCH CIRCLE = 2
NUMBER IN THREE INCH CIRCLE = 4

11 Mar 1988 FILE:/PATTERNING/CENTERFIRE_PATT/9854NJ5

CENTERFIRE PATTERNS # 3



OF SHOTS= 5

IN CIR

1in = 1

2in = 2

3in = 5

HS= 2.268

VS= 1.357

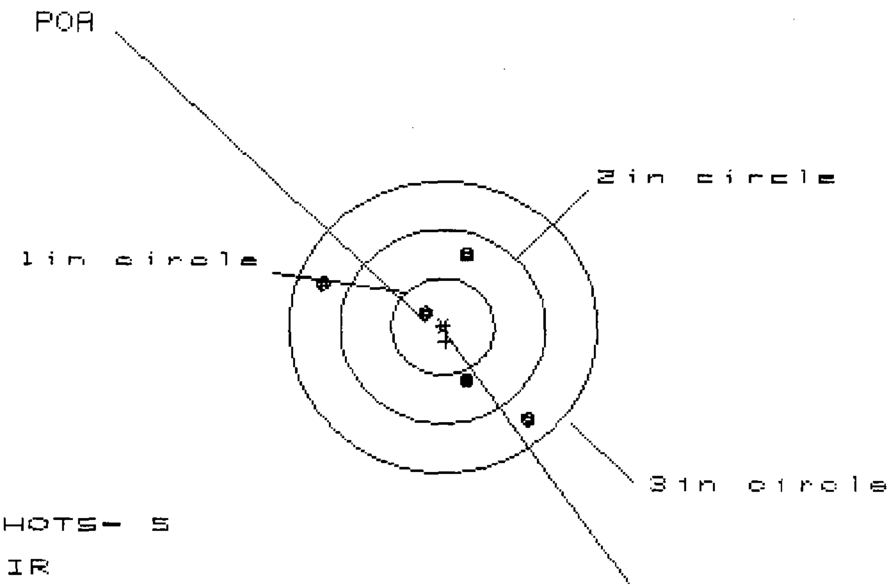
GS= 2.280

PATTERN #	:	3		
SHOTS (BEST OF)	:	5	4	3
MAXIMUM X	:	1.270	.807	.666
MINIMUM X	:	-.998	-.681	-.412
MAXIMUM Y	:	.395	.342	.055
MINIMUM Y	:	-.962	-.863	-.031
CENTROID X	:	-.283	-.600	-.869
CENTROID Y	:	.211	.112	.399
POA TO CENTROID in.	:	.353	.611	.957
ANGLE POA CENTROID	:	126.675	100.546	114.672
MIN RADIUS	:	.256	.524	.256
MEAN RADIUS	:	.907	.755	.446
MAX RADIUS	:	1.330	1.182	.669
HORIZONTAL SPREAD	:	2.268	1.488	1.078
VERTICAL SPREAD	:	1.357	1.205	.086
EXTREME SPREAD	:	2.280	1.862	1.081

NUMBER IN ONE INCH CIRCLE = 1
NUMBER IN TWO INCH CIRCLE = 2
NUMBER IN THREE INCH CIRCLE = 5

11 Mar 1988 FILE:/PATTERNING/CENTERFIRE_PATT/9854RJS

CENTERFIRE PATTERNS # 1



OF SHOTS= 5
IN CIR
1 in = 1
2 in = 3
3 in = 5
HS= 1.986
VS= 1.638
GS= 2.434

CENTROID *

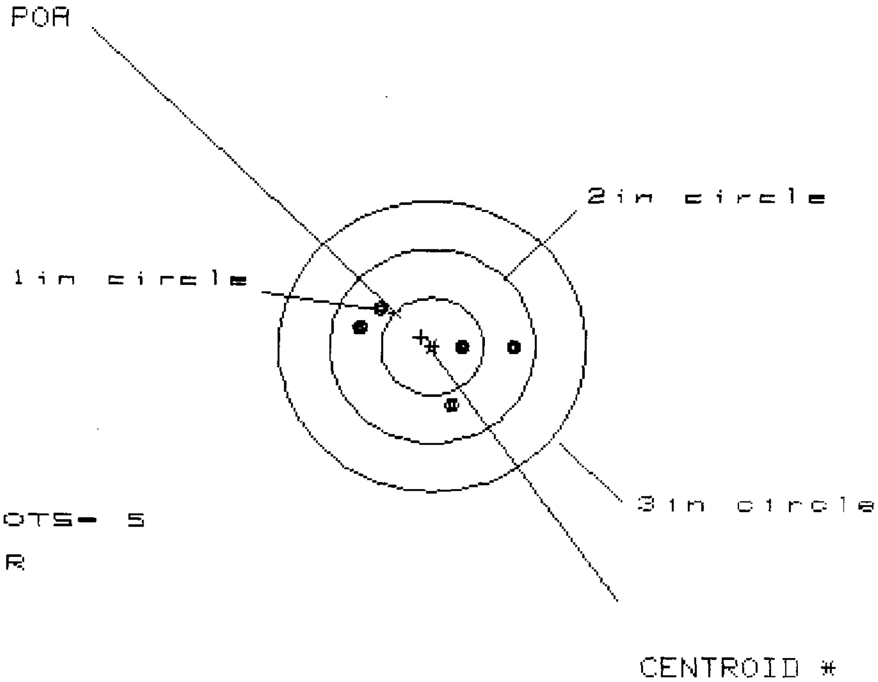
1.824

PATTERN #	:	1		
SHOTS (BEST OF)	:	5	4	3
MAXIMUM X	:	.855	.488	.182
MINIMUM X	:	-1.131	-.917	-.307
MAXIMUM Y	:	.725	.497	.587
MINIMUM Y	:	-.911	-.731	-.641
CENTROID X	:	-.030	-.244	.062
CENTROID Y	:	.153	.381	.291
POA TO CENTROID in.	:	.156	.452	.298
ANGLE POA CENTROID	:	168.834	147.347	78.049
MIN RADIUS	:	.289	.035	.312
MEAN RADIUS	:	.819	.634	.526
MAX RADIUS	:	1.250	.955	.653
HORIZONTAL SPREAD	:	1.986	1.405	.489
VERTICAL SPREAD	:	1.636	1.228	1.228
EXTREME SPREAD	:	2.434	1.677	1.229

NUMBER IN ONE INCH CIRCLE = 1
NUMBER IN TWO INCH CIRCLE = 3
NUMBER IN THREE INCH CIRCLE = 5

11 Mar 1988 FILE:/PATTERNING/CENTERFIRE_PATT/9854RJS

CENTERFIRE PATTERNS # 2



OF SHOTS= 5

# IN CIR
1in = 1
2in = 5
3in = 5

HS= 1.570
VS= 1.072
GS= 1.580

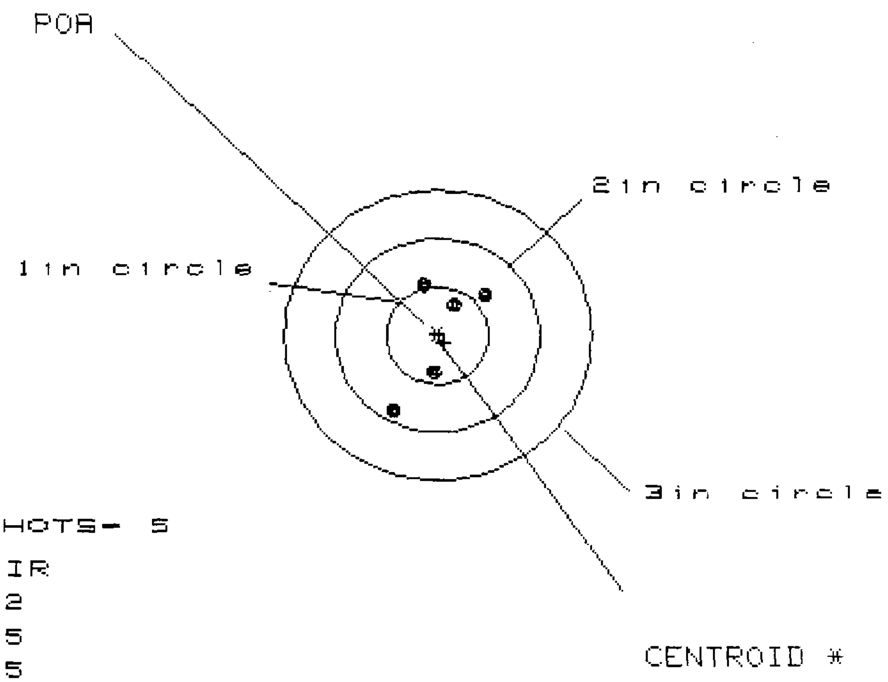
PATTERN # : 2

SHOTS (BEST OF)	:	5	4	3
MAXIMUM X	:	.833	.450	.273
MINIMUM X	:	-.737	-.528	-.484
MAXIMUM Y	:	.426	.435	.511
MINIMUM Y	:	-.646	-.636	-.561
CENTROID X	:	.109	-.100	.077
CENTROID Y	:	-.096	-.105	-.181
POA TO CENTROID in.	:	.145	.145	.197
ANGLE POA CENTROID	:	311.364	226.676	337.082
MIN RADIUS	:	.244	.450	.278
MEAN RADIUS	:	.637	.576	.527
MAX RADIUS	:	.834	.745	.704
HORIZONTAL SPREAD	:	1.570	.978	.757
VERTICAL SPREAD	:	1.072	1.072	1.072
EXTREME SPREAD	:	1.580	1.277	1.277

NUMBER IN ONE INCH CIRCLE = 1
NUMBER IN TWO INCH CIRCLE = 5
NUMBER IN THREE INCH CIRCLE = 5

11 Mar 1988 FILE:/PATTERNING/CENTERFIRE_PATT/9854RJS

CENTERFIRE PATTERNS # 3



OF SHOTS= 5

# IN CIR
1in = 2
2in = 5
3in = 5

HS= .908
VS= 1.251
GS= 1.458

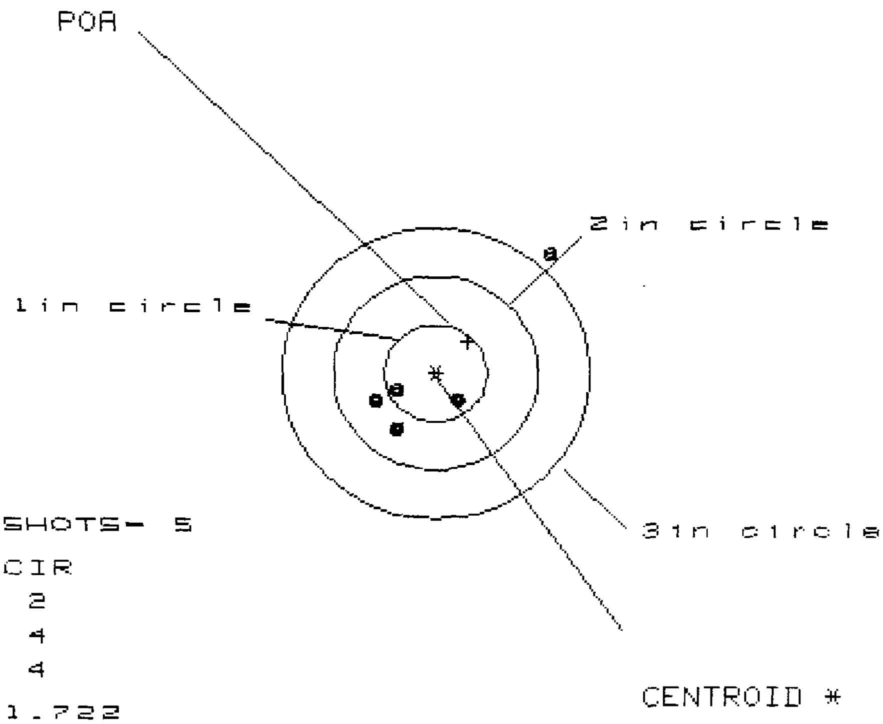
PATTERN # : 3

SHOTS (BEST OF)	:	5	4	3
MAXIMUM X	:	.463	.352	.188
MINIMUM X	:	-.445	-.263	-.146
MAXIMUM Y	:	.488	.297	.360
MINIMUM Y	:	-.763	-.603	-.540
CENTROID X	:	-.063	.048	-.069
CENTROID Y	:	.075	.266	.203
POA TO CENTROID in.	:	.098	.270	.215
ANGLE POA CENTROID	:	139.805	79.752	161.143
MIN RADIUS	:	.358	.137	.261
MEAN RADIUS	:	.553	.389	.397
MAX RADIUS	:	.883	.623	.542
HORIZONTAL SPREAD	:	.908	.615	.334
VERTICAL SPREAD	:	1.251	.900	.900
EXTREME SPREAD	:	1.458	.941	.906

NUMBER IN ONE INCH CIRCLE = 2
NUMBER IN TWO INCH CIRCLE = 5
NUMBER IN THREE INCH CIRCLE = 5

11 Mar 1998 FILE:/PATTERNING/CENTERFIRE_PATT/9601NDT

CENTERFIRE PATTERNS # 1



OF SHOTS- 5

IN CIR
1 in - 2
2 in - 4
3 in = 4

HS- 1.722
VS= 1.804
GS= 2.356

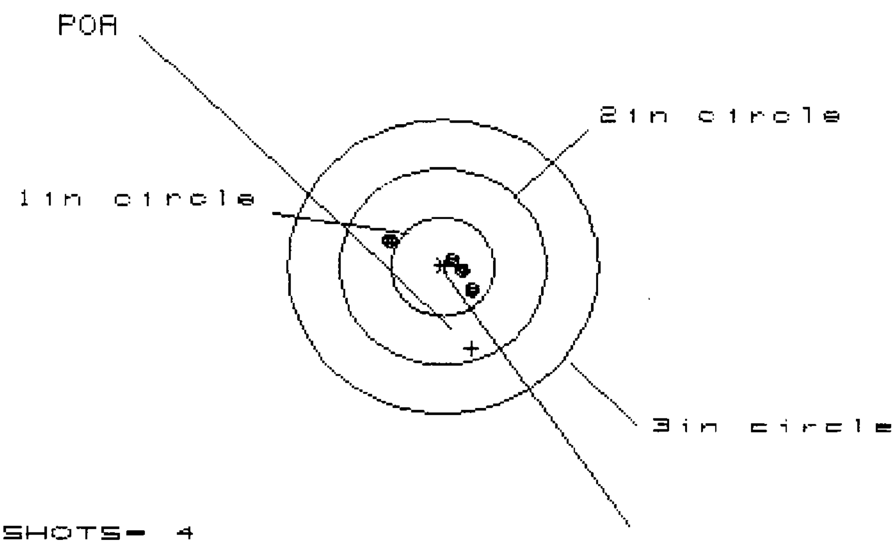
1.626

PATTERN #	:	1		
SHOTS (BEST OF)	:	5	4	3
MAXIMUM X	:	1.124	.527	.421
MINIMUM X	:	-.598	-.317	-.217
MAXIMUM Y	:	1.265	.148	.146
MINIMUM Y	:	-.539	-.223	-.225
CENTROID X	:	-.317	-.598	-.492
CENTROID Y	:	-.328	-.644	-.642
POA TO CENTROID in.	:	.456	.879	.809
ANGLE POA CENTROID	:	225.942	227.110	232.531
MIN RADIUS	:	.341	.178	.252
MEAN RADIUS	:	.759	.319	.331
MAX RADIUS	:	1.692	.533	.429
HORIZONTAL SPREAD	:	1.722	.844	.638
VERTICAL SPREAD	:	1.804	.371	.371
EXTREME SPREAD	:	2.356	.848	.706

NUMBER IN ONE INCH CIRCLE = 2
NUMBER IN TWO INCH CIRCLE = 4
NUMBER IN THREE INCH CIRCLE = 4

11 Mar 1988 FILE:/PATTERNING/CENTERFIRE_PATT/9601NDT

CENTERFIRE PATTERNS # 2



CENTROID *

OF SHOTS= 4

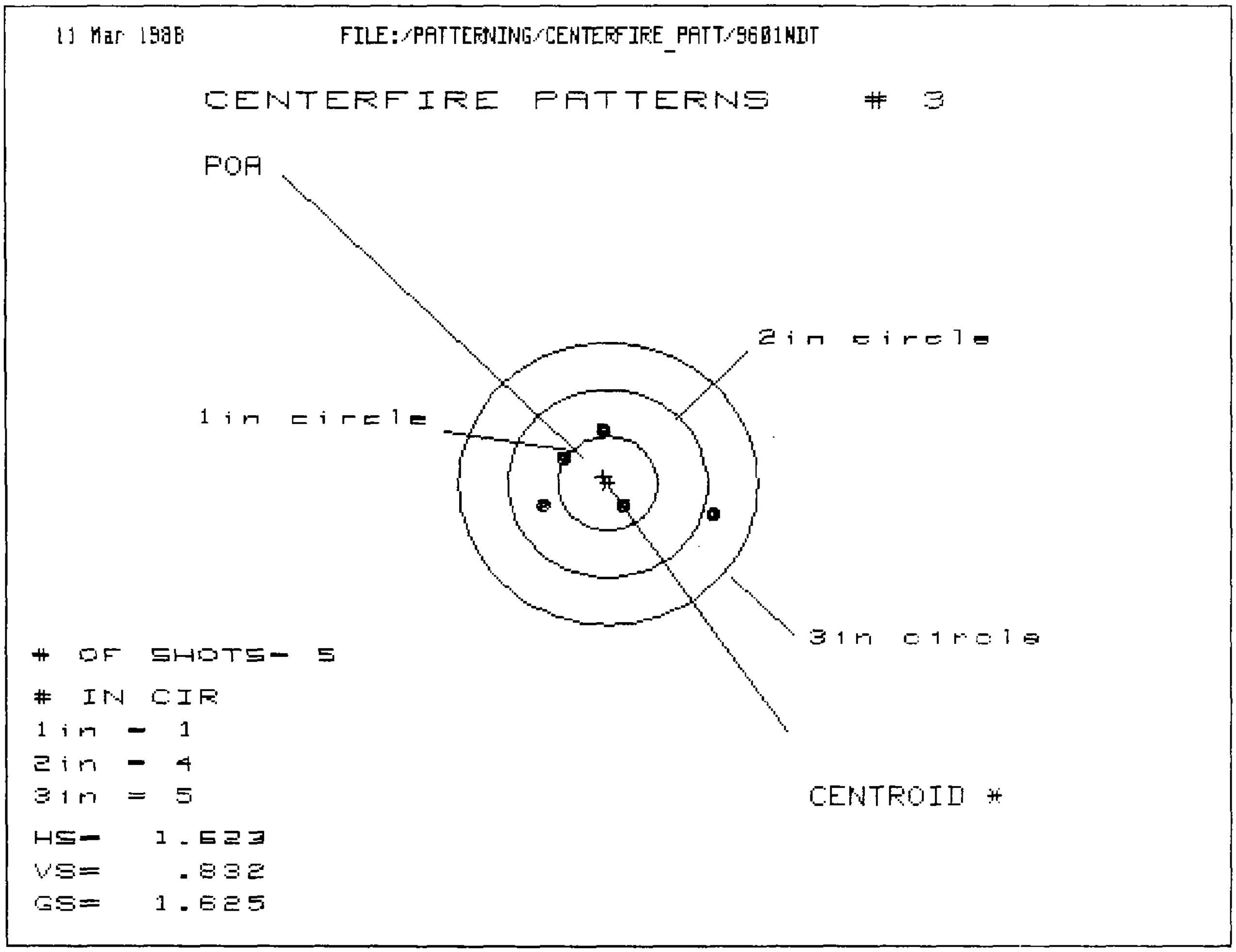
# IN CIR
1in = 3
2in = 4
3in = 4

HS= .760
VS= .478
GS= .898

PATTERN # : 2

SHOTS (BEST OF)	:	4	3	2
MAXIMUM X	:	.261	.095	.073
MINIMUM X	:	-.499	-.120	-.073
MAXIMUM Y	:	.220	.161	.069
MINIMUM Y	:	-.258	-.185	-.069
CENTROID X	:	-.284	-.118	-.165
CENTROID Y	:	.833	.760	.853
POA TO CENTROID in.	:	.880	.769	.868
ANGLE POA CENTROID	:	161.179	171.199	169.046
MIN RADIUS	:	.099	.035	.100
MEAN RADIUS	:	.302	.148	.100
MAX RADIUS	:	.545	.208	.100
HORIZONTAL SPREAD	:	.760	.215	.146
VERTICAL SPREAD	:	.478	.346	.137
EXTREME SPREAD	:	.898	.407	.200

NUMBER IN ONE INCH CIRCLE = 3
NUMBER IN TWO INCH CIRCLE = 4
NUMBER IN THREE INCH CIRCLE = 4

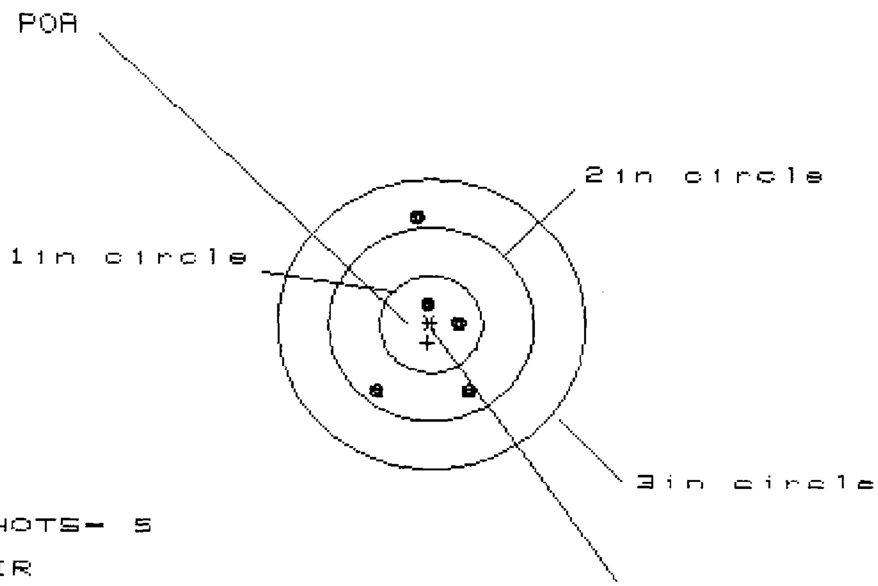


PATTERN #	:	3		
SHOTS (BEST OF)	:	5	4	3
MAXIMUM X	:	1.013	.395	.276
MINIMUM X	:	-.610	-.357	-.341
MAXIMUM Y	:	.534	.460	.360
MINIMUM Y	:	-.298	-.321	-.421
CENTROID X	:	.047	-.206	-.087
CENTROID Y	:	-.072	.002	.102
POA TO CENTROID in.	:	.086	.206	.134
ANGLE POA CENTROID	:	327.010	90.556	139.430
MIN RADIUS	:	.285	.274	.346
MEAN RADIUS	:	.612	.436	.405
MAX RADIUS	:	1.056	.509	.504
HORIZONTAL SPREAD	:	1.623	.752	.617
VERTICAL SPREAD	:	.832	.781	.781
EXTREME SPREAD	:	1.625	.932	.809

NUMBER IN ONE INCH CIRCLE = 1
NUMBER IN TWO INCH CIRCLE = 4
NUMBER IN THREE INCH CIRCLE = 5

11 Mar 1988 FILE:/PATTERNING/CENTERFIRE_PATT/96B1RDT

CENTERFIRE PATTERNS # 1



OF SHOTS- 5
IN CIR
1in - 2
2in - 4
3in = 5
HS- .903
VS= 1.848
GS= 1.939

2.438

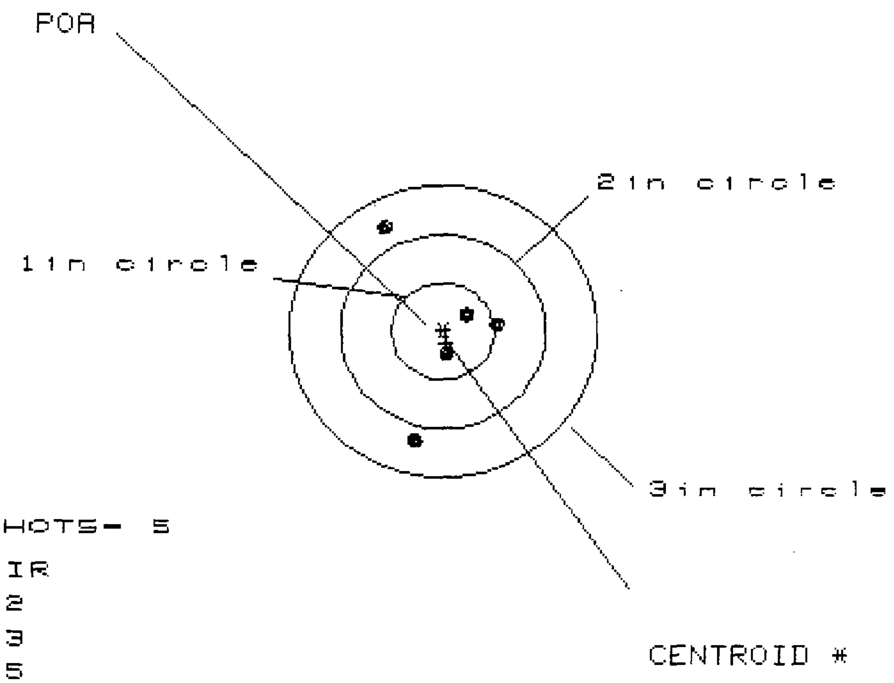
PATTERN # : 1

SHOTS (BEST OF)	:	5	4	3
MAXIMUM X	:	.415	.372	.195
MINIMUM X	:	-.488	-.531	-.214
MAXIMUM Y	:	1.145	.517	.392
MINIMUM Y	:	-.703	-.416	-.541
CENTROID X	:	.033	.076	.253
CENTROID Y	:	.190	-.097	.028
POA TO CENTROID in.	:	.192	.123	.255
ANGLE POA CENTROID	:	80.185	321.849	6.241
MIN RADIUS	:	.230	.336	.150
MEAN RADIUS	:	.653	.515	.390
MAX RADIUS	:	1.158	.649	.575
HORIZONTAL SPREAD	:	.903	.903	.409
VERTICAL SPREAD	:	1.848	.933	.933
EXTREME SPREAD	:	1.939	1.019	1.019

NUMBER IN ONE INCH CIRCLE = 2
NUMBER IN TWO INCH CIRCLE = 4
NUMBER IN THREE INCH CIRCL. = 5

11 Mar 1988 FILE:/PATTERNING/CENTERFIRE_PATT/9601RDT

CENTERFIRE PATTERNS # 2



OF SHOTS= 5

IN CIR

1 in = 2

2 in = 3

3 in = 5

HS= 1.080

VS= 2.217

GS= 2.233

PATTERN # : 2

SHOTS (BEST OF)	:	5	4	3
MAXIMUM X	:	.514	.440	.227
MINIMUM X	:	-.566	-.640	-.211
MAXIMUM Y	:	1.056	.765	.180
MINIMUM Y	:	-1.161	-.484	-.229
CENTROID X	:	-.029	.045	.258
CENTROID Y	:	.125	.416	.161
POA TO CENTROID in.	:	.129	.418	.304
ANGLE POA CENTROID	:	166.805	83.857	31.912
MIN RADIUS	:	.208	.211	.181
MEAN RADIUS	:	.694	.545	.241
MAX RADIUS	:	1.199	.997	.311
HORIZONTAL SPREAD	:	1.080	1.080	.438
VERTICAL SPREAD	:	2.217	1.249	.409
EXTREME SPREAD	:	2.233	1.453	.518

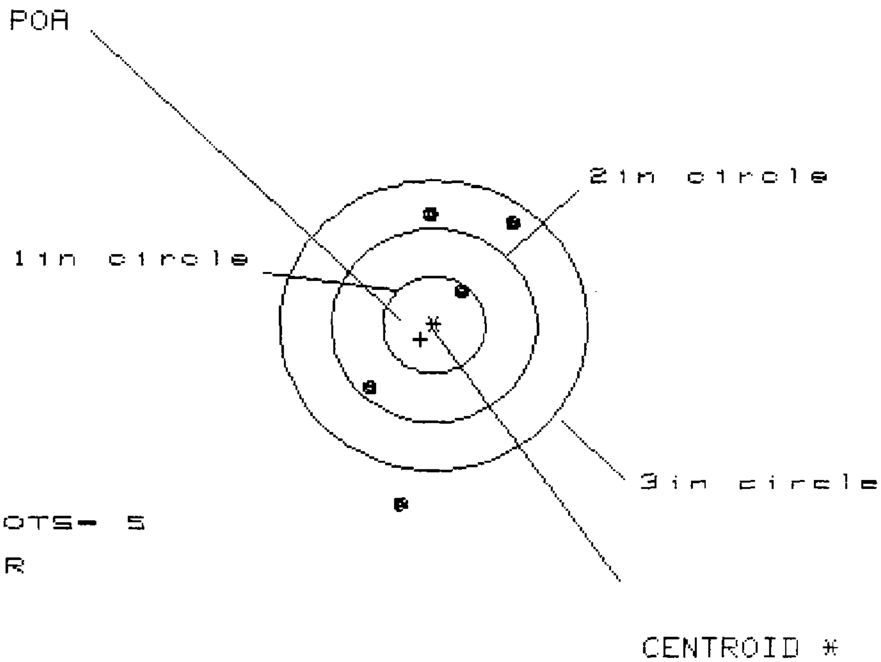
NUMBER IN ONE INCH CIRCLE = 2

NUMBER IN TWO INCH CIRCLE = 3

NUMBER IN THREE INCH CIRCLE = 5

11 Mar 1988 FILE:/PATTERNING/CENTERFIRE_PATT/9601RDT

CENTERFIRE PATTERNS # 3



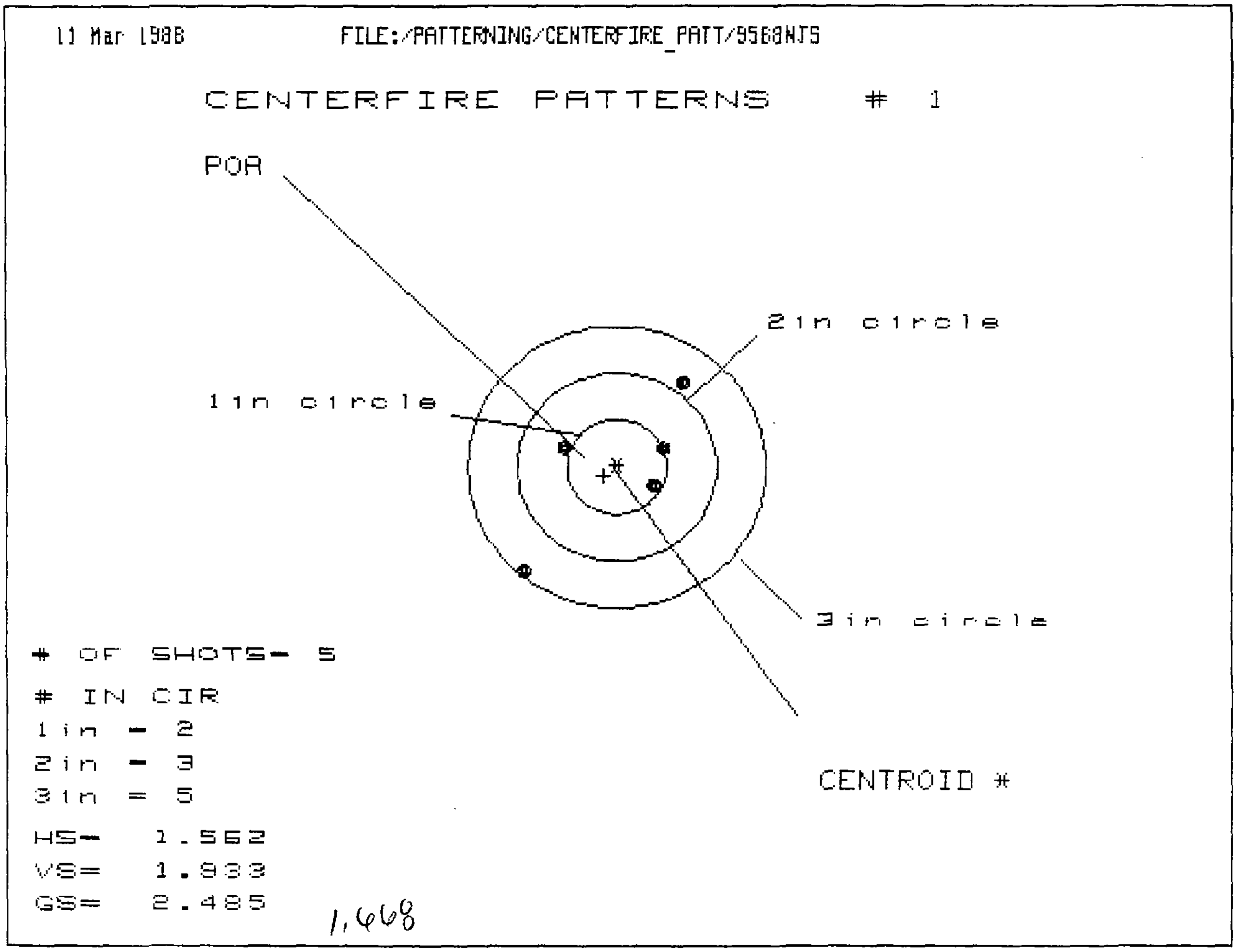
OF SHOTS- 5

IN CIR
1in - 1
2in - 2
3in = 4

HS- 1.424
VS= 2.985
GS= 3.141

PATTERN #	:	3		
SHOTS (BEST OF)	:	5	4	3
MAXIMUM X	:	.794	.701	.410
MINIMUM X	:	-.630	-.723	-.489
MAXIMUM Y	:	1.116	.648	.842
MINIMUM Y	:	-1.869	-1.148	-.954
CENTROID X	:	.129	.222	-.012
CENTROID Y	:	.146	.614	.420
POA TO CENTROID in.	:	.195	.653	.420
ANGLE POA CENTROID	:	48.527	70.114	178.410
MIN RADIUS	:	.471	.194	.425
MEAN RADIUS	:	1.147	.782	.781
MAX RADIUS	:	1.906	1.356	1.072
HORIZONTAL SPREAD	:	1.424	1.424	.899
VERTICAL SPREAD	:	2.985	1.796	1.796
EXTREME SPREAD	:	3.141	2.239	1.884

NUMBER IN ONE INCH CIRCLE = 1
NUMBER IN TWO INCH CIRCLE = 2
NUMBER IN THREE INCH CIRCLE = 4



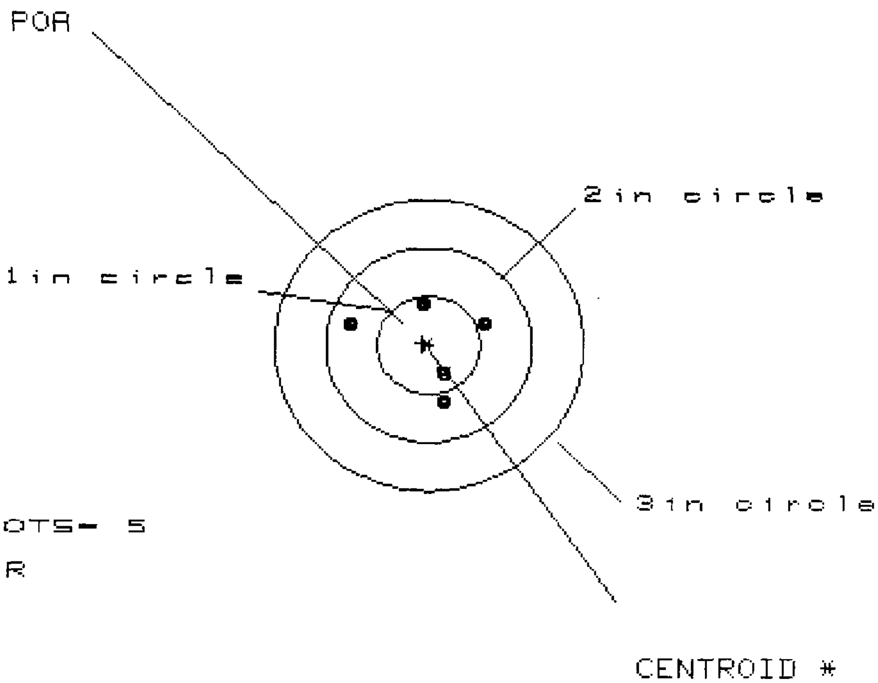
PATTERN # : **1**

SHOTS (BEST OF)	:	5	4	3
MAXIMUM X	:	.626	.392	.336
MINIMUM X	:	-.936	-.744	-.613
MAXIMUM Y	:	.874	.609	.164
MINIMUM Y	:	-1.059	-.465	-.262
CENTROID X	:	.131	.365	.234
CENTROID Y	:	.096	.361	.158
POA TO CENTROID in.	:	.162	.513	.283
ANGLE POA CENTROID	:	36.390	44.724	34.084
MIN RADIUS	:	.430	.230	.350
MEAN RADIUS	:	.789	.547	.455
MAX RADIUS	:	1.414	.745	.634
HORIZONTAL SPREAD	:	1.562	1.136	.949
VERTICAL SPREAD	:	1.933	1.074	.426
EXTREME SPREAD	:	2.485	1.308	.987

NUMBER IN ONE INCH CIRCLE = 2
NUMBER IN TWO INCH CIRCLE = 3
NUMBER IN THREE INCH CIRCLE = 5

11 Mar 1988 FILE:/PATTERNING/CENTERFIRE_PATT/8568NJS

CENTERFIRE PATTERNS # 2



OF SHOTS= 5

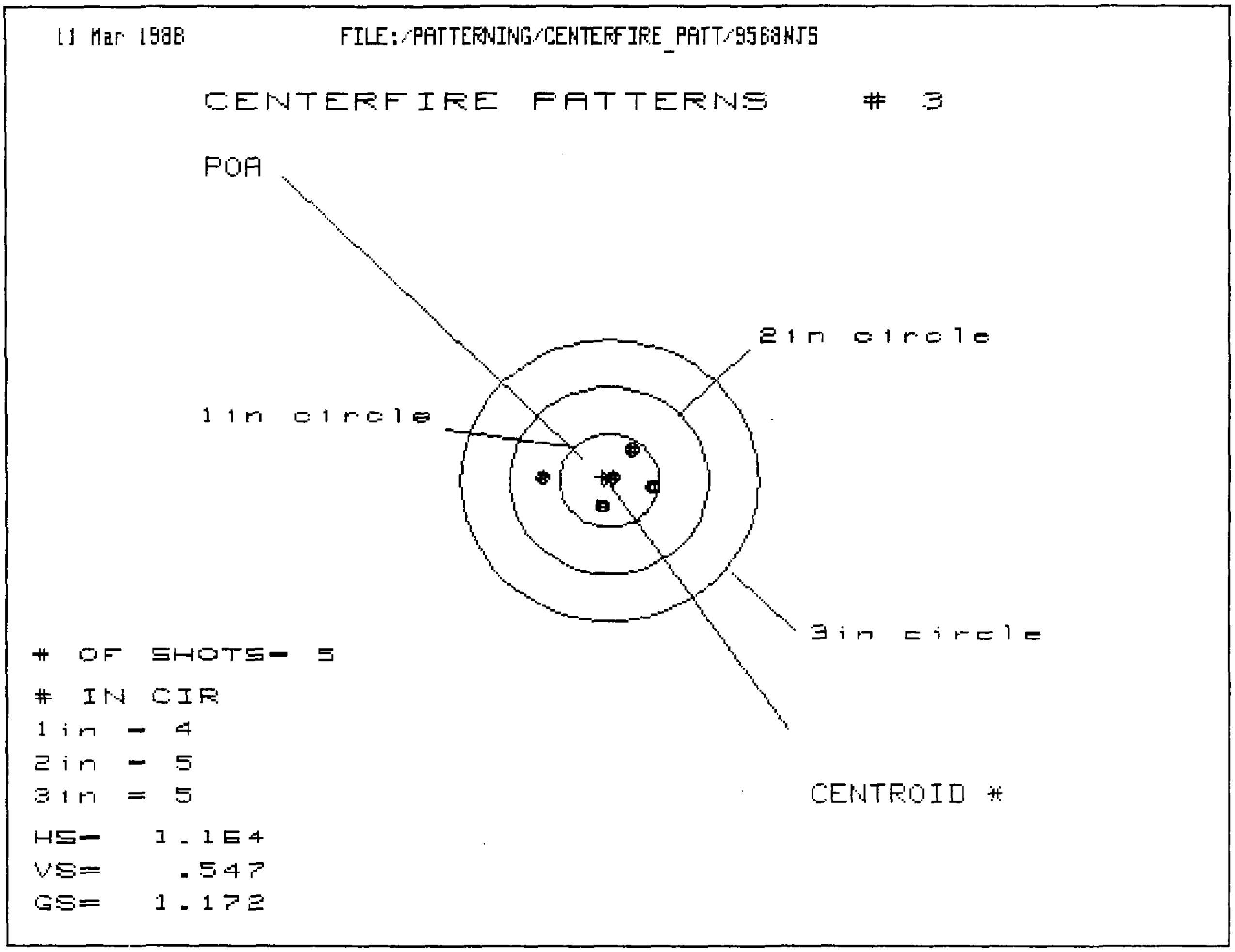
# IN CIR
1in = 2
2in = 5
3in = 5

HS= 1.346
VS= 1.017
GS= 1.346

PATTERN # : 2

SHOTS (BEST OF)	:	5	4	3
MAXIMUM X	:	.567	.372	.087
MINIMUM X	:	-.779	-.234	-.110
MAXIMUM Y	:	.446	.496	.574
MINIMUM Y	:	-.571	-.521	-.443
CENTROID X	:	.057	.252	.128
CENTROID Y	:	-.026	-.076	-.154
POA TO CENTROID in.	:	.063	.263	.201
ANGLE POA CENTROID	:	294.278	286.835	320.329
MIN RADIUS	:	.277	.233	.134
MEAN RADIUS	:	.543	.436	.390
MAX RADIUS	:	.805	.549	.585
HORIZONTAL SPREAD	:	1.346	.606	.197
VERTICAL SPREAD	:	1.017	1.017	1.017
EXTREME SPREAD	:	1.346	1.036	1.036

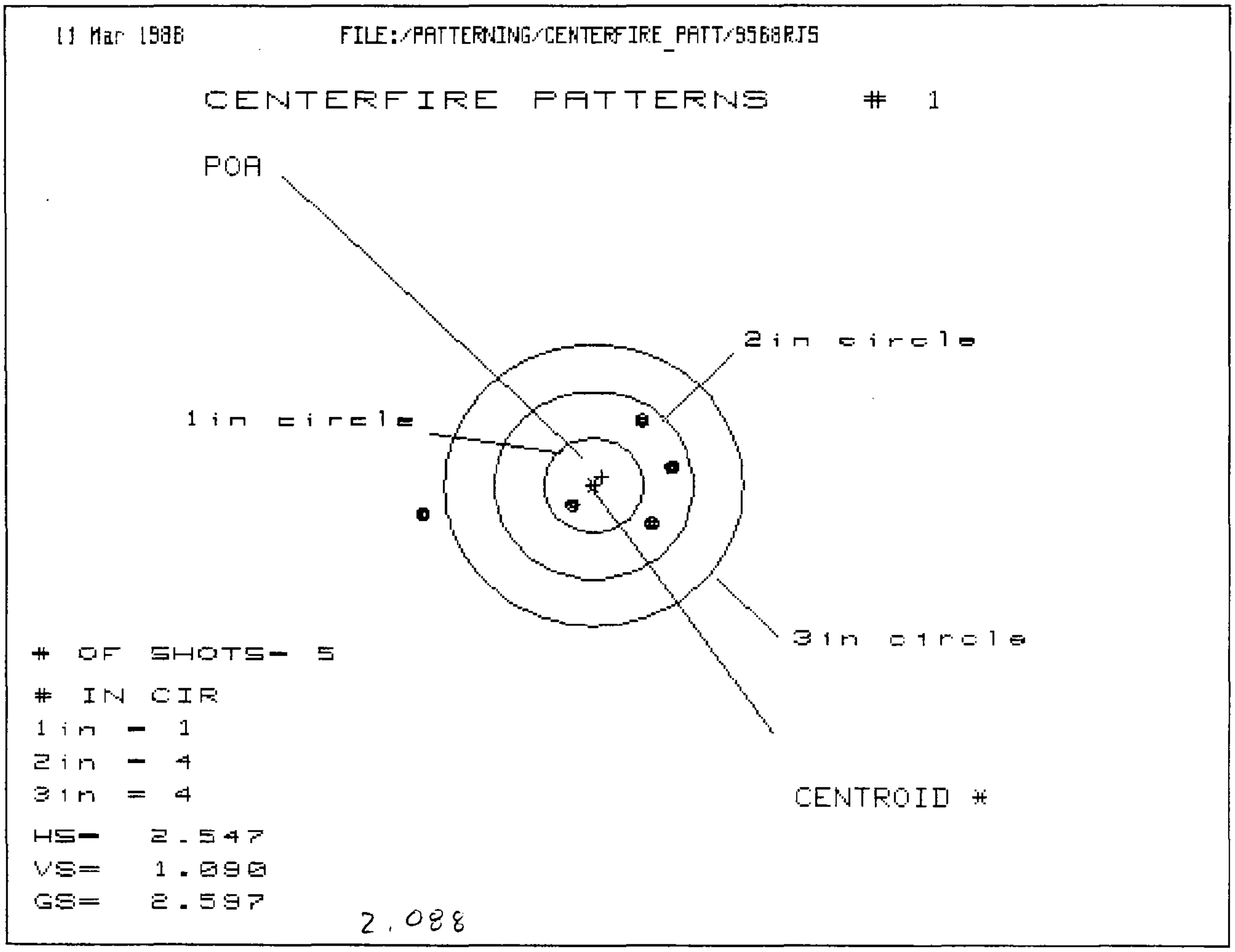
NUMBER IN ONE INCH CIRCLE = 2
NUMBER IN TWO INCH CIRCLE = 5
NUMBER IN THREE INCH CIRCLE = 5



PATTERN # : 3

SHOTS (BEST OF)	:	5	4	3
MAXIMUM X	:	.462	.286	.128
MINIMUM X	:	-.702	-.212	-.116
MAXIMUM Y	:	.299	.309	.279
MINIMUM Y	:	-.248	-.238	-.268
CENTROID X	:	.070	.246	.150
CENTROID Y	:	-.036	-.046	-.016
POA TO CENTROID in.	:	.079	.250	.151
ANGLE POA CENTROID	:	297.345	280.613	276.214
MIN RADIUS	:	.068	.109	.017
MEAN RADIUS	:	.372	.260	.205
MAX RADIUS	:	.703	.318	.307
HORIZONTAL SPREAD	:	1.164	.498	.244
VERTICAL SPREAD	:	.547	.547	.547
EXTREME SPREAD	:	1.172	.599	.599

NUMBER IN ONE INCH CIRCLE = 4
NUMBER IN TWO INCH CIRCLE = 5
NUMBER IN THREE INCH CIRCLE = 5

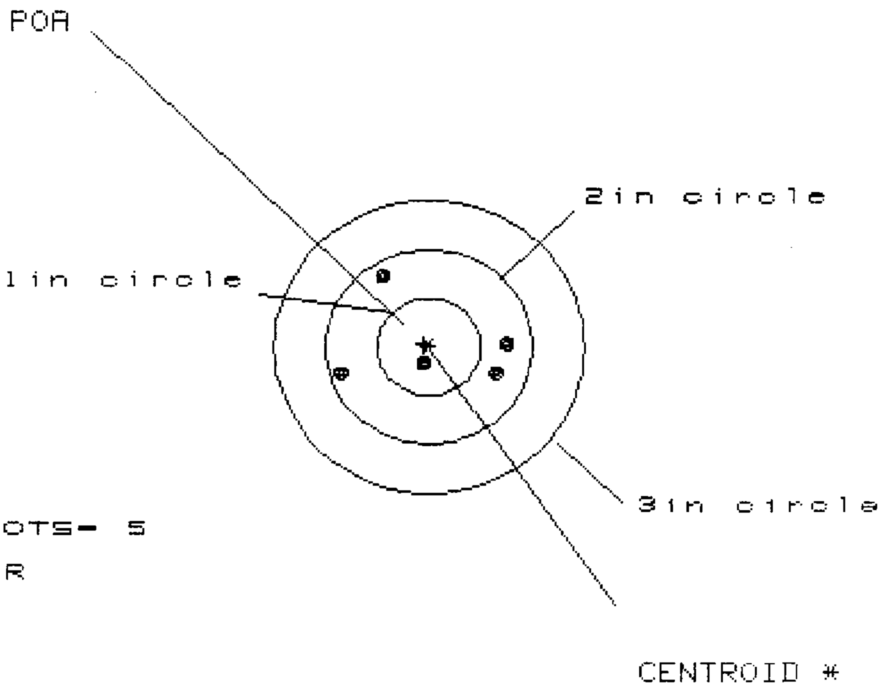


PATTERN #	:	1		
SHOTS (BEST OF)	:	5	4	3
MAXIMUM X	:	.826	.396	.417
MINIMUM X	:	-1.721	-.641	-.620
MAXIMUM Y	:	.722	.637	.291
MINIMUM Y	:	-.368	-.453	-.241
CENTROID X	:	-.087	.343	.322
CENTROID Y	:	-.094	-.009	-.221
POA TO CENTROID in.	:	.128	.344	.390
ANGLE POA CENTROID	:	227.402	271.501	304.531
MIN RADIUS	:	.276	.403	.314
MEAN RADIUS	:	.892	.556	.482
MAX RADIUS	:	1.755	.693	.622
HORIZONTAL SPREAD	:	2.547	1.037	1.037
VERTICAL SPREAD	:	1.090	1.090	.532
EXTREME SPREAD	:	2.597	1.144	1.092

NUMBER IN ONE INCH CIRCLE = 1
NUMBER IN TWO INCH CIRCLE = 4
NUMBER IN THREE INCH CIRCLE = 4

11 Mar 1988 FILE:/PATTERNING/CENTERFIRE_PATT/9568RJS

CENTERFIRE PATTERNS # 2



\# OF SHOTS= 5

\# IN CIR
1in = 1
2in = 5
3in = 5

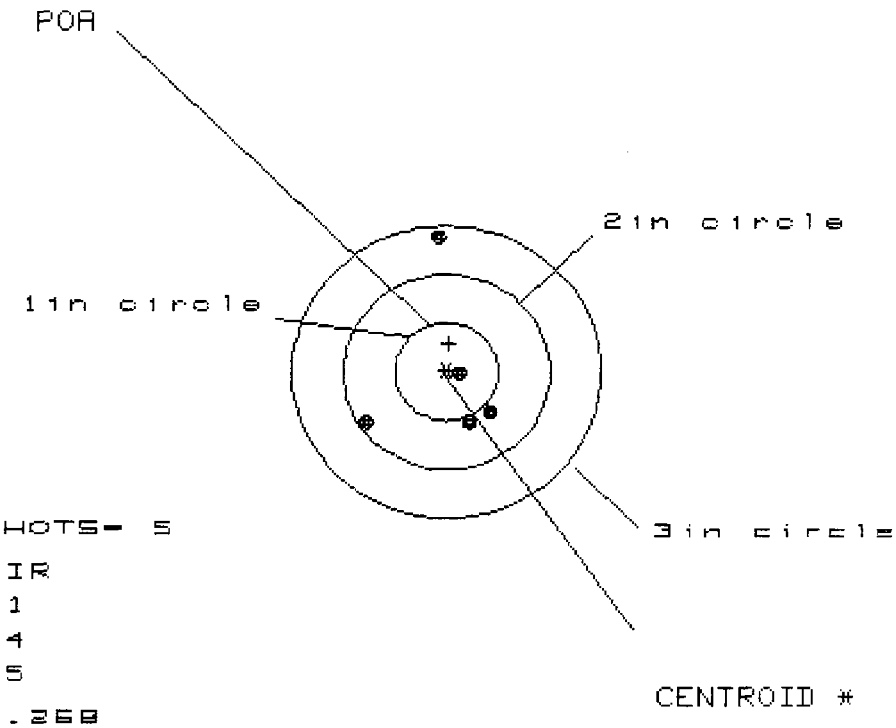
HS= 1.638
VS= .973
GS= 1.664

PATTERN #	:	2		
SHOTS (BEST OF)	:	5	4	3
MAXIMUM X	:	.758	.538	.324
MINIMUM X	:	-.880	-.644	-.498
MAXIMUM Y	:	.696	.627	.157
MINIMUM Y	:	-.277	-.344	-.135
CENTROID X	:	.048	.268	.482
CENTROID Y	:	-.033	.036	-.173
POA TO CENTROID in.	:	.058	.270	.512
ANGLE POA CENTROID	:	304.782	7.658	289.732
MIN RADIUS	:	.174	.366	.221
MEAN RADIUS	:	.668	.581	.360
MAX RADIUS	:	.922	.899	.499
HORIZONTAL SPREAD	:	1.638	1.182	.822
VERTICAL SPREAD	:	.973	.971	.292
EXTREME SPREAD	:	1.664	1.418	.841

NUMBER IN ONE INCH CIRCLE = 1
NUMBER IN TWO INCH CIRCLE = 5
NUMBER IN THREE INCH CIRCLE = 5

11 Mar 1988 FILE:/PATTERNING/CENTERFIRE_PATT/9568RJS

CENTERFIRE PATTERNS # 3



OF SHOTS= 5

# IN CIR
1in = 1
2in = 4
3in = 5

HS= 1.268
VS= 1.855
GS= 2.003

PATTERN #	:	3		
SHOTS (BEST OF)	:	5	4	3
MAXIMUM X	:	.444	.436	.159
MINIMUM X	:	-.824	-.832	-.133
MAXIMUM Y	:	1.351	.352	.302
MINIMUM Y	:	-.504	-.166	-.216
CENTROID X	:	-.024	-.016	.261
CENTROID Y	:	-.290	-.628	-.578
POA TO CENTROID in.	:	.291	.628	.635
ANGLE POA CENTROID	:	265.315	268.541	335.683
MIN RADIUS	:	.152	.302	.181
MEAN RADIUS	:	.722	.491	.243
MAX RADIUS	:	1.352	.845	.330
HORIZONTAL SPREAD	:	1.268	1.268	.292
VERTICAL SPREAD	:	1.855	.518	.518
EXTREME SPREAD	:	2.003	1.273	.529

NUMBER IN ONE INCH CIRCLE = 1
NUMBER IN TWO INCH CIRCLE = 4
NUMBER IN THREE INCH CIRCLE = 5

M700 Semi Powder Metal

Sear from rifle
no. 225

Connector, Sear, Safety Cam 1-7-13
Used in 721, 722, 700, 600

A 15436 Connector M600, 660
A 19461 Connector M721, 722, 700
B 19461 Connector M721, 722, 700 Current part.

1B17945 Safety Cam (Blank) 721, 722, 700
2B17945 Safety Cam 721, 722, 40X
B15369 Safety Cam M600, 700, 40~~X~~B

1961

1B17946 Sear (Blank) M721, 722, 725, 700
2B17946 Sear M721, 722, 725, 700

1C 17946 Sear (Blank) M721, 722, 725 Before 61
C 17946 Sear M721, 722, 725

N 26590 Introduced in 1961 Sear Safety Cam assembly (2 pc.) M600, 700

N 22045 Sear Safety Cam assembly (2pc.) M721, 722

C 15666 Introduced 1966 Sear Safety Cam assembly M600, 700

CC: R.A. Williamson
H.J. Hackman
L.J. Boyle
~~W.C. Schreder~~ Brooks
~~M.H. Walker~~
A.J. Seckner) In
D.E. Geiss)turn
V.G. DeReus
Estimate File #2502

April 13, 1966

A.D. KERR

MODEL 600-700 SEAR AND SAFETY CAM ASSEMBLY
USING INVENTORIES OF OLD DESIGN PARTS VERSUS
THEIR DISPOSAL AND SUBSTITUTING WITH THE
NEW ONE-PIECE POWDER METAL ASSEMBLY

It is our understanding that approximately 40,000 Sears and Safety Cams are on the plant in the "as received" condition.

In view of the apparent attractive cost for the new one-piece powder metal design, a review has been made to determine an economic disposition of the parts on hand.

Discounting the purchase price, the estimated direct cost to complete these parts into Sear and Safety Cam Assemblies is $11,500. The estimated cost to produce (per our present process) 40,000 of the one-piece powder metal assemblies is $4,300. This indicates a gross savings of $7,200 in plant operating costs with the powder metal component.

When sufficient quantities of new parts are available to meet production requirements, it would seem economically advisable to dispose of any old part inventories in the "as received" condition.

F. G. Carlson, Supervisor
Methods & Standards Section

RFKerr

R. F. Kerr

RFK:am

cc: R.A. Williamson
S.M. Alvis
H.J. Hackman
V.G. DeReus
A.J. Seckner) In
D.E. Geiss)
Estimate File #2502

April 4, 1966

M. H. WALKER

MODELS 700, 600, 100, 40XB - SEAR AND SAFETY CAM ASSEMBLY
COST COMPARISON - OLD TWO-PIECE DESIGN VERSUS
NEW POWDER METAL SINGLE-PIECE CONSTRUCTION

In response to your recent request, estimates have been developed to show a comparison of full factory costs. Costs for the proposed single-piece powder metal design are based on the common process just released by PE&C.

Sear and Safety Cam Assembly	Present Part No.	Estimated Cost per 100 Present	Estimated Cost per 100 Proposed	Estimated Reduction per 100
Model 700, 600	26591	$ 53.91	$ 14.72	$ 39.19
Model XP-100	26735	54.10	14.72	39.38
Model 40XB	26591	63.97	14.72	49.25

Our 1966-#2 Sales Forecast totaling 87,125 units, shows a full factory cost reduction of approximately $34,300 with the new process.

F. G. Carlson, Supervisor
Methods & Standards Section

RFKerr
R. F. Kerr

RFK:sm

cc: J.E. Leek
C.H. Morse
~~M.M. Walker~~
J.W. Brooks
~~H.J. Waterman~~
R.P. Kelly

Ilion, New York
June 23, 1966

MEMORANDUM

TO: C. B. Workman CBW

FROM: A. A. Hugick

DROP TESTING OF MODEL 600 POWDER METAL SEARS

The enclosed drop test procedure was organized and conducted using the M/600 with one piece powder metal sears. Drop testing at ten inches corresponds to the test manual standard and waist high drop testing (45") was included for increasing drop test severity. A sample of chrome plate powder metal sears produced to date was included for drop test purposes. Sears numbered 1 thru 5 are old style sears with the large .003+ inch radius at the connector surface edge. Sear numbered 6 thru 8 are new sears with .001± inch radius at the connector surface edge.

Fire control adjustments were made by production prior to drop testing.

Listed below are M/600 powder metal sear drop test observations:

1. The measured RC hardness of the new PM samples was 45 RC average versus 50 RC average for old samples.
2. No malfunctions were experienced at the normal drop height of 10".
3. Page 2 contains listed jar-off malfunctions encountered during the waist high M/600 drop testing. These high drop malfunctions are similar to prior test results of May 1964 special "Jar-Off" testing.
4. Tight sear pin holes of the new sears were polished out prior to drop testing.
5. Minor chipping of the sear connector edge of the old sear was noticed when examined with a 20X glass.

RECOMMENDATION

Based on M/700 and M/600 chrome plated powder metal sear testing, the new chromed powder metal sears should be considered for use in the M/600.

AAH:e
Enc.

REMINGTON ARMS COMPANY, INC.

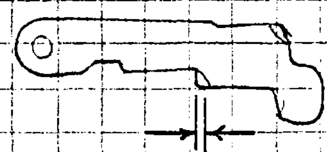
ENGINEERING DEPARTMENT COMPUTATION SHEET Sheet No. 1

M 600 POWDER METAL SEAR Proj. No.

CHROME PLATED POWDER METAL SEAR Work

DATA FOR DROP TESTING Computer AAH. Date 6-9-66

SEAR NUMBER	TOTAL NUMBER OF DRY CYCLES	SEAR RADIUS AT CONNECTOR EDGE	SEAR COMPONENT WEIGHT & HARDNESS	AVE. TRIG. PULL AT BEGINNING AND END OF TEST
1	0	.0034	9.3900 gr. 48 RC SCALE	5.77 - 5.60
2	0	.0039	9.3705 gr. 51 RC SCALE	6.25 - 5.30
3	0	.0042	9.3655 gr. 53 RC SCALE	5.45 - 5.70
4	0	.0039	9.4176 gr. 51.5 RC SCALE	5.00 - 4.85
5	0	.004	9.4423 gr. 53 RC SCALE	5.50 - 5.05
6	0	.0005+	9.5337 gr 44.5 RC SCALE	5.50 - 5.50
7	0	.000+	9.5182 gr 46.5 RC SCALE	5.90 - 5.70
8	0	.0012	9.4955 grams 45.0 RC SCALE	5.25 - 5.50



SEAR RADIUS AT CONNECTOR EDGE MEASURED ON THE OPTICAL COMPARATOR.

WAIST HIGH IS TAKEN AS 45 INCHES.

REMINGTON ARMS COMPANY, INC.

ENGINEERING DEPARTMENT COMPUTATION SHEET SHEET NO. 2

M 600 POWDER METAL SEAR PROJ. N

DROP TEST RESULT WITH M600 WORKS

PM SEAR TESTING COMPUTER AAH. DATE 6-14-66

TYPE OF SEAR TESTED	NUMBER OF FAILURES	DROP TEST STEP NO.	NUMBER OF SEARS TESTED	TEST GUN SERIAL NO.	COMMENTS
STANDARD PROD.	1	VI-2	2	20344	
STANDARD PROD.	1	VI-4	2	20344	
FIRST PM.	0	—	1	—	
LARGE CON. RAD.	1	VI-4	4	1167	
LAST SHARP SEARS	1	VI-3	3	1167	
LAST SHARP SEARS	1	VI-2	3	20344	

VI JAR OFF TEST

A. DROP GUN "WAIST HIGH" ON SOLID WOOD SURFACE WITH SAFETY "OFF".
1. BUTT DOWN
2. MUZZLE DOWN
3. TOP SIDE DOWN
4. BOTTOM SIDE DOWN

B. TRIGGER SHALL BE TRIED AFTER EACH DROP TO DETERMINE WHETHER THE SAFETY HAS RELEASED ANY MECHANISM WHICH MAY ALLOW FIRING.

C. THREE DROPS PER POSITION.

"WAIST HIGH" IS TAKEN AS 45 INCHES.

CHRONOLOGICAL RECORD OF TESTING

MODEL & DESCRIPTION M/600 New P.M. sears

CALIBER ~~or GAUGE~~ 308 ~~[illegible]~~ (LATEST - SHARP)

DATE 6-3-66 TEST P.M Sear Drop Test (re-test) TESTER J. Hennings. PAGE NO.

barrels - # 11679 20344 were used placing different sears in these two barrels only (3 sears)

✓ Test - I - Trigger pulls & firing pin indents (on sep. sheets.)

✓ Test - II - No malfunctions noticed.

✓ Test - III - (butt down) sear # 2 had a total of 3 drops in which the saftey was jarred to the "ON" pos.

✓ Test - IV - No malfunctions noticed.

✓ Test V - (muzzle down) sears # 1, 2 & 3 had a total of 7 drops in which the saftey was jarred to the "OFF" pos.

Test - VI - (butt down) - sear # 1 - on all three drops the saftey was jarred to the "ON" pos.

(muzzle down) - sear # 3 on second drop gun fired.

top-side down - sear # 2 on first drop gun fired.

CHRONOLOGICAL RECORD OF TESTING

MODEL & DESCRIPTION m/600 new P.M. sears.

CALIBER ~~or GAUGE~~ 308 (LARGE RAD. SEAR

DATE 6-2-66 TEST P.M. Sear Drop Test TESTER J. Hennings. PAGE NO.

✓barrels #1167 + 20344 were used placing different sears in these two barrels only.

✓Test - I - Trigger pulls + firing pin indents (on sep. sheets)

✓Test - II - No malfunctions noticed.

✓Test III - (muzzle down) - sears #1+2 had a total of 5 drops in which saftey jarred to "ON" position.

✓Test - IV - No malfunctions noticed.

✓Test - V - (butt down) - sears #1,2,3,4,5 had a total of 13 drops in which saftey jarred to "OFF" position.

Test - VI - (muzzle down) - sears #2,3,4 had a total of 9 drops in which saftey was jarred to "ON" Position
(top side down) - sear #2 - on third drop bolt jarred open.
(bottom side down) - sear #4 on second drop the jar fired the firing pin.

NOTE! ON BOTH ACTIONS PIN HOLE WAS TIGHT CAUSING SEAR TO BIND!

CHRONOLOGICAL RECORD OF TESTING

MODEL & DESCRIPTION m/600 std. sear drop test.

CALIBER ~~or~~ GAUGE 308 PRESENT PRODUCTION (2 PIECE)

DATE TEST TESTER PAGE NO.

6-13-66 66 l.s # 1167 + 20344 308 cal. m/600 were dropped from various pos. with std. sears in fire-control

#1167 all tests ok except Test V. muzzle-down waist high the safe jarred to "off" pos. on all 3 drop

" 20344 Tests I-IV- OK

Test V - (butt down waist high) -> safe jarred to "off" pos on all 3 drop

Test VI -> (muzzle-down waist high) on 1st drop gun fired.

Test VI -> (bottom-side down waist high) - on 3rd drop gun fired

Test - VI -> (butt down waist high) -> safe jarred to "on" pos. on 3rd drop

CONFIDENTIAL-SUBJECT TO PROTECTIVE ORDER
KINZER V. REMINGTON

R2538534

RD-69-B

REMINGTON ARMS COMPANY, INC.

INTER-DEPARTMENTAL CORRESPONDENCE

Remington DUPONT   PETERS DUPONT

"CONFINE YOUR LETTER TO ONE SUBJECT ONLY"

DROP TEST PROCEDURE

MEASUREMENT and TEST LAB

I. Trigger Pull and Firing Pin Indent

A. Take five samples.

II. Safety Mechanism Shock Test

A. Drop gun ten inches on solid wood surface with safety "ON".

1. Butt down
2. Muzzle down
3. Topside down
4. Bottom down

B. The Trigger shall be tried after each drop to determine whether the safety has released any mechanism which may allow firing.

C. Three drops per position.

III. Jar-Off Test

A. Drop gun ten inches on solid wood surface with safety "OFF".

1. Butt down
2. Muzzle down
3. Topside down
4. Bottomside down

B. The Trigger shall be tried after each drop to determine whether the safety has released any mechanism which may allow firing.

C. Three drops per position.

AAH:T
566

IV. <u>Safety Operations Test</u>

A. This test is for testing the safety mechanism.

1. Cock gun
2. Put Safety "ON"
3. Try Trigger
4. Release the Safety
5. Pull Trigger
6. Record if Trigger functions with Safety on
7. Record if Firing Pin fell when Trigger was pulled

B. Make 50 trials.

V. <u>Safety Mechanism Shock Test</u>

A. Drop gun "waist height" on solid wood surface with safety "ON".

1. Butt down
2. Muzzle down
3. Topside down
4. Bottomside down

B. The Trigger shall be tried after each drop to determine whether the Safety has released any mechanism which may allow firing.

C. Three drops per position.

VI. <u>Jar Off Test</u>

A. Drop gun "waist height" on solid wood surface with safety "OFF".

1. Butt down
2. Muzzle down
3. Topside down
4. Bottomside down

B. Trigger shall be tried after each drop to determine whether the safety has released any mechanism which may allow firing.

C. Three drops per position.

VII. <u>Gun Function Check</u>

A. Trigger pull
B. Firing pin indent
C. Take sample of five.

AAH:T
566

J. Brooks

Ilion, New York
June 13, 1960

MEMORANDUM

To: C. H. Workman

From: A. A. Hugick

DROP TESTING OF MODEL 700 POWDER METAL SEARS

The enclosed drop test procedure was organized and conducted using M/700 powder metal sears. Two samples of M/700 sears were submitted for drop testing at this time.

Sample No. 1 consisted of M/700 chrome plated powder metal sears with approximately .003" radius when received from Production and had been cock-and-fire dry cycled for 30,000 cycles each. No malfunctions of the sear were encountered during drop testing of sample No. 1 sears.

Sample No. 2 consisted of M/700 chrome plated powder metal sear with approximately .0005-.001" radius at the connector edge, increased density, and zero dry cycles. No malfunctions of the sear were experienced during drop test of the M/700. This sample of sears had tight pin holes and had to be polished out for testing.

The fire control adjustment was made by Production prior to the dry cycle and drop testing. Hardness measurements on the RC scale varied from 38.5 RC to 54.5 RC. This variation of measured RC hardness should be clarified. Kelly Chadwick [illegible]

Recommendations:

Based on test results of submitted test samples, the chrome plated powder metal sears should be considered for use in the M/700.

If the hardness difference is considered significant, some of the latest, softer sears should be dry cycled for wear on the sear connector edge.

Enc.
AAH:c

REMINGTON ARMS COMPANY, INC.

ENGINEERING DEPARTMENT COMPUTATION SHEET

M700 PM SEAR TEST
DROP TEST SEAR DATA.

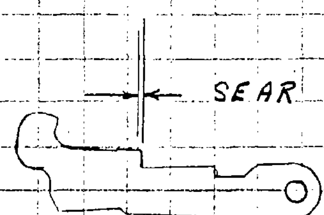
AAH.

SAMPLE NUMBER ONE

SEAR NUMBER	TOTAL NUMBER OF DRY CYCLES	SEAR RADIUS AT CONNECTOR EDGE	SEAR COMPONENT WEIGHT & HARDNESS	AVE. TRIG. PULL @ BEGINNING AND END OF TEST
153959	30,000	.0045	9.3685 GRAMS 38.5 RC SCALE	5.10 - 5.10
139298	30,000	.0035	9.4080 gr. 52 RC SCALE	5.20 - 5.15
139413	30,000	.0050	9.4200 gr. 51.5 RC SCALE	3.90 - 3.80
139555	30,000	.0068	9.3880 52 RC SCALE	4.90 - 4.55
139312	30,000	.0029	9.4140 gr. 51 RC SCALE	NOT TESTED
139457	30,000	.0053	9.4310 gr. 54.5 RC SCALE	4.60 - 4.75

SAMPLE NUMBER TWO

TESTED IN 139298 BLUE	00	.0005	9.5332 38.5 RC SCALE	5.55* - 4.95
TESTED IN 139413	00	.0011	9.5000 45.0 RC SCALE	4.85 - 4.75



SEAR RADIUS AT CONNECTOR MEASURED ON OPTICAL COMPARATOR

WAIST HEIGHT WAS TAKEN AT 45 INCHES.

CHRONOLOGICAL RECORD OF TESTING

MODEL & DESCRIPTION ~~ADL~~ 700 POWDER METAL ~~[illegible]~~ SEAR WITH [illegible] ~~[illegible]~~

CALIBER ~~or GAUGE~~ .243

DATE 6-1-66 TEST M/700 sear drop test TESTER J. Hennings. PAGE NO.

Barrels - 139298, 153959, 139555, 139457, 139413 - were used with POWDER METAL ~~[illegible]~~ sears.

Test - I - Trigger pulls & Firing pin indents - (seperate sheets)

Test - II - (Top side - down) #139457 on second drop rear sight broke

Test - III - (bottom side down) #139457 on first & second drops bolt jarred open

Test - IV - no malfunctions noticed

Test - V - (top-side down) #139457 on second drop rear sight came off. (bottom-side down) #139298 on second drop stock started to crack around trigger plate.

Test - VI - (muzzLE down) sears #1, 2, 3, had a total of 7 drops in which saftey was jared to "ON" position. (top-side down) sears #1, 3, 4, 5 - had a total of 5 drops in which bolt was jarred open. (#139298 on third drop saftey jarred to "ON" position.) (bottom - side down) sears - #1, 2, 3, 4 - had a total of 5 drops in which bolt jarred ~~open~~. (#139555 on first drop stock broke just behind trigger guard.)

CHRONOLOGICAL RECORD OF TESTING

MODEL & DESCRIPTION 700 P.M sear (LATEST PROD W SHARP RAD)

CALIBER ~~or GAUGE~~ .243

DATE 6-1-66 TEST P.M sear drop test TESTER PAGE NO.

J. Hennings

barrels # 139298 + 139413 were used with new P.m sears.

TEST - I - Trigger pulls + firing pin indents (seperate sheets)

Test - II - (butt down) - # 139298 - on first drop rear sight broke off.

TEST III - (MUZZLE DOWN) - # 139298 - on second drop bolt jarred open.

TEST - IV - no malfunctions noticed.

TEST - V - no malfunctions noticed.

TEST - VI - (butt down) both guns - a total of 4 drops in which saftey was jarred open.

139298 on third drop bolt jarred open.

NOTE! ON BOTH ACTIONS PIN HOLE WAS TIGHT CAUSING SEAR TO BIND -

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KINZER V. REMINGTON

R2538540

RD-69-B

REMINGTON ARMS COMPANY, INC.

INTER-DEPARTMENTAL CORRESPONDENCE

Remington DU PONT   PETERS DU PONT

"CONFINE YOUR LETTER TO ONE SUBJECT ONLY"

DROP TEST PROCEDURE

MEASUREMENT and TEST LAB

I. Trigger Pull and Firing Pin Indent

A. Take five samples.

II. Safety Mechanism Shock Test

A. Drop gun ten inches on solid wood surface with safety "ON" Safe.

1. Butt down
2. Muzzle down
3. Topside down
4. Bottom down

B. The Trigger shall be tried after each drop to determine whether the safety has released any mechanism which may allow firing.

C. Three drops per position.

III. Jar-Off Test

A. Drop gun ten inches on solid wood surface with safety "OFF" Safe.

1. Butt down
2. Muzzle down
3. Topside down
4. Bottomside down

B. The Trigger shall be tried after each drop to determine whether the safety has released any mechanism which may allow firing.

C. Three drops per position.

AAH:T
566

IV. Safety Operations Test

A. This test is for testing the safety mechanism.

1. Cock gun
2. Put Safety "ON"
3. Try Trigger
4. Release the Safety
5. Pull Trigger
6. Record if Trigger functions with Safety on
7. Record if Firing Pin fell when Trigger was pulled

B. Make 50 trials.

V. Safety Mechanism Shock Test

A. Drop gun "waist height" on solid wood surface with safety "ON" Safe.

1. Butt down
2. Muzzle down
3. Topside down
4. Bottomside down

B. The Trigger shall be tried after each drop to determine whether the Safety has released any mechanism which may allow firing.

C. Three drops per position.

VI. Jar Off Test

A. Drop gun "waist height" on solid wood surface with safety "OFF" Safe.

1. Butt down
2. Muzzle down
3. Topside down
4. Bottomside down

B. Trigger shall be tried after each drop to determine whether the safety has released any mechanism which may allow firing.

C. Three drops per position.

VII. Gun Function Check

A. Trigger pull
B. Firing pin indent
C. Take sample of five.

AAH:T
566

Received 5-31-66

Model 700 -

Description

Barrel ~~[illegible]~~	# 139298
Caliber	.243
Type of Feed	bolt
Other	~~[illegible]~~ ~~[illegible]~~ # 1 POWDER METAL .0035R.

Date 6-1-66

Firing Pin Indent (Inches)

Before	
1	.020
2	.020
3	.020
4	.020
5	.020
Avg. of 5	.020
Max.	.020
Min.	.020
Ev.	0

Firing Pin Indent

After	
1	.021
2	.021
3	.0205
4	.021
5	.021
Avg. of 5	.0209
Max.	.021
Min.	.0205
Ev.	.0005

Trigger Pull (lbs.)

Before	
1	5.50
2	5.25
3	5.00
4	5.25
5	5.00
Avg. of 5	5.20
Max.	5.50
Min.	5.00
Ev.	.50

Trigger Pull (lbs.)

After	
1	5.00
2	5.00
3	5.25
4	5.25
5	5.25
Avg. of 5	5.15
Max.	5.25
Min.	5.00
Ev.	.25

661. #139 298

Test - I - OK

" II - OK

" III - OK

" IV - OK

" V - A.

4. on second drop stock started to crack around trigger plate.

" VI. A.

~~1~~. on first + second drops safety jarred to "ON" position.

3. on second drop bolt opened.
on third drop saftey jarred to "ON" position.

4. on second & third drops bolt jarred open

Received 5-31-66 Model 700

Description

Barrel ~~Len.~~	# 153959
Caliber	.243
Type of Feed	Bolt
Other	~~[illegible]~~ # 2 Powder metal work.

Date 6-1-66

Firing Pin Indent (Inches)

	Before	After
1	.020	.0215
2	.0195	.0215
3	.0195	.022
4	.020	.022
5	.020	.0215
Avg. of 5	.0198	.0217
Max.	.020	.022
Min.	.0195	.0215
Ev.	.0005	.0005

Trigger Pull (lbs.)

	Before	After
1	4.75	5.25
2	5.25	5.00
3	4.75	5.25
4	5.25	5.00
5	5.50	5.00
Avg. of 5	5.10	5.10
Max.	5.50	5.25
Min.	4.75	5.00
Ev.	.50	.25

651 153.95-9

Test- I - OK

Test II - OK

" III - OK

" IV - OK

" V - OK

" VI - A.

B. on all three drops safety was jarred to "ON" position.

4. on third drop bolt opened

Date Received 5-31-66 Model 700

Description

Barrel ~~Len.~~	# 139550
Caliber	.243
Type of Feed	6014
Other	~~prod.~~ ~~[illegible]~~ # 3 Powder Metal .0068 R

Date 6-1-66

Firing Pin Indent (Inches)

Before		After	
1	.021	1	.021
2	.021	2	.022
3	.020	3	.0215
4	.020	4	.022
5	.020	5	.0215
Avg. of 5	.0204	Avg. of 5	.0216
Max.	.021	Max.	.022
Min.	.020	Min.	.021
Ev.	.001	Ev.	.001

Trigger Pull (lbs.)

Before		After	
1	4.75	1	4.50
2	4.75	2	4.75
3	4.75	3	4.50
4	4.75	4	4.50
5	5.50	5	4.50
Avg. of 5	4.90	Avg. of 5	4.55
Max.	5.50	Max.	4.75
Min.	4.75	Min.	4.50
Ev.	.75	Ev.	.25

661 # 139555

Test I - OK

" II - OK

" III - OK

" IV OK

" V OK

" VI A.

1. - on second and third drops saftey was jared to "ON" position.

3. - on first + third drops bolt opened on recoil of drop.

4. stock broke at rear of trigger guar on first drop.
on second drop bolt opened on recoil of drop.

Date Received 5-31-66

Model 700

Description

Barrel No.	#	139457
Caliber		.243
Type of Feed		bolt
Other:		~~good~~. ~~[illegible]~~ #4
		Powder [illegible] .0053 R.

Date 6-1-66

Firing Pin Indent (Inches) Before		Firing Pin Indent After	
1	.020	1	.019
2	.020	2	.019
3	.020	3	.019
4	.020	4	.020
5	.0195	5	.019
Avg. of 5	.0199	Avg. of 5	.0192
Max.	.020	Max.	.020
Min.	.0195	Min.	.019
Ev.	.0005	Ev.	.001

Trigger Pull (lbs.) Before		Trigger Pull (lbs.) After	
1	4.75	1	4.75
2	4.75	2	4.75
3	4.50	3	4.75
4	4.50	4	4.75
5	4.50	5	4.75
Avg. of 5	4.60	Avg. of 5	4.75
Max.	4.75	Max.	4.75
Min.	4.50	Min.	4.75
Ev.	.25	Ev.	0

661. # 139457

Test - I - OK

" II - A.

3. on second drop rear sight broke

" III - A.

4. - on first + second drop bolt jarred open.

" IV - OK

" V - A.

3. on second drop rear sight came off.

" VI A.

3 on third drop bolt jarred open

Received 5-31-66

Model 700

Description

Barrel ~~Len.~~	# 139413
Caliber	.243
Type of Feed	6014
Other	~~prod.~~ ~~seam~~ # 5 POWDER METAL .0050 R.

Date 6-1-66

Firing Pin Indent (Inches) Before		Firing Pin Indent After	
1	.019	1	.019
2	.019	2	.020
3	.0195	3	.0195
4	.019	4	.019
5	.019	5	.019
Avg. of 5	.0191	Avg. of 5	.0193
Max.	.0195	Max.	.020
Min.	.019	Min.	.019
Ev.	.0005	Ev.	.001

Trigger Pull (lbs.) Before		Trigger Pull (lbs.) After	
1	3.75	1	4.00
2	3.75	2	3.75
3	4.00	3	3.75
4	4.00	4	3.75
5	4.00	5	3.75
Avg. of 5	3.90	Avg. of 5	3.80
Max.	4.00	Max.	4.00
Min.	3.75	Min.	3.75
Ev.	.25	Ev.	.25

661. #139413

Test- I - OK

Test - II - OK

" - III - OK

" - IV - OK

" - V - OK

" - VI - A. 1- OK

2.- first drop bolt jarred open

3. bolt jarred open on third drop.

4.- OK

Page______

PROCEDURE

GUN DESIGN SPECIFICATIONS SHEET

Date Received 5-31-66 Model 700 243 cal.

Description:

Barrel Length #139298 new sear
Caliber 243
Type of Feed bolt.
Other

			Design Spec	Tester	Date
I	Headspace as Received				
II	Proof Test	☐ Yes			
III	Headspace after Proof				
IV	Firing Pin Indent (Inches)				
	1 .019	6 .019			
	2 .018	7 .019			
	3 .0185	8 .019			
	4 .0185	9 .019			
	5 .0185	10 .019			
	Avg. of 10	.0185 .019			
	Max.	.019 .019			
	Min.	.018 .019			
	E.V.	.001 0			
V	Trigger Pull (Lbs.)				
	1 5.50	6 6.00			
	2 6.25	7 4.75			
	3 5.50	8 4.25			
	4 5.25	9 4.50			
	5 5.25	10 5.25			
	Avg. of 10	5.55 4.95			
	Max.	6.25 6.00			
	Min.	5.25 4.25			
	E.V.	1.00 1.75			
VI	Firing Pin Protrusion (in.)				
	(a) Positive				
	(b) Extreme				

465

Date Received 5-31-66

Model 700

Description

Barrel Len.	# 139298
Caliber	.243
Type of Feed	bolt
Other	New P.M. sear #1

Date 6-2-66

Firing Pin Indent (Inches)

Before

1	.019
2	.018
3	.0185
4	.0185
5	.0185
Avg. of 5	.0185
Max.	.019
Min.	.018
Ev.	.001

Firing Pin Indent

After

1	.019
2	.019
3	.019
4	.019
5	.019
Avg. of 5	.019
Max.	.019
Min.	.019
Ev.	0

Trigger Pull (lbs.)

Before

1	5.50
2	6.25
3	5.50
4	5.25
5	5.25
Avg. of 5	5.55
Max.	6.25
Min.	5.25
Ev.	1.00

Trigger Pull (lbs.)

After

1	6.00
2	4.75
3	4.25
4	4.50
5	5.25
Avg. of 5	4.95
Max.	6.00
Min.	4.25
Ev.	1.75

661 # 139298 new sear

Test - I - OK

" II - A.

1.- on first drop rear sight broke off.

2.- OK

3.- OK

4.- OK.

" III - A. 2. on second drop bolt jarred open

" IV - OK

" V - OK

" VI - A.

1. on second & third drops saftey was jarred to "ON" position

4. on third drop bolt jarred open.

Date Received 5-31-66 Model 700

Description

Barrel ~~Len.~~	# 139413
Caliber	.243
Type of Feed	Bolt
Other	New P.M. sear # 2

Date 6-2-66

Firing Pin Indent (Inches)

Before	
1	.018
2	.018
3	.018
4	.018
5	.018
Avg. of 5	.018
Max.	.018
Min.	.018
Ev.	0

Firing Pin Indent

After	
1	.019
2	.019
3	.0185
4	.0185
5	.019
Avg. of 5	.0188
Max.	.019
Min.	.0185
Ev.	.0005

Trigger Pull (lbs.)

Before	
1	5.00
2	4.75
3	5.00
4	4.75
5	4.75
Avg. of 5	4.85
Max.	5.00
Min.	4.75
Ev.	.25

Trigger Pull (lbs.)

After	
1	4.75
2	4.75
3	4.50
4	4.50
5	5.25
Avg. of 5	~~4.75~~ 4.76
Max.	5.25
Min.	4.50
Ev.	.75

bbl. - # 139413 new sear.

this sear is very loggy

Test - I - OK

" - II - OK

" - III - OK

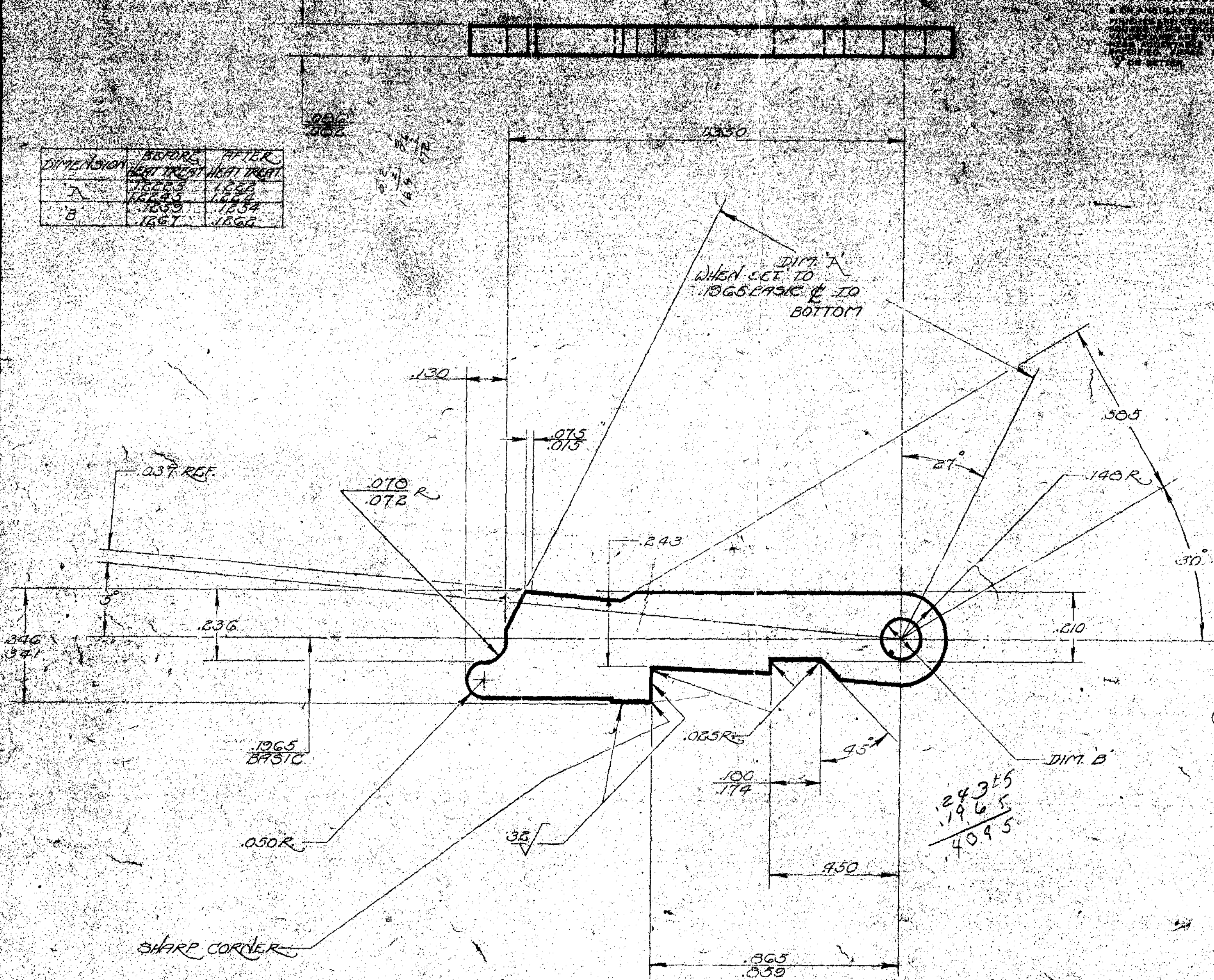
" IV - OK

" V - OK

" VI - A.

1. - on first & third drops saftey jarred to "ON" position.

DIMENSION	BEFORE HEAT TREAT	AFTER HEAT TREAT
A	.12253 / .12245	.1252 / .1244
B	.1259 / .1267	.1254 / .1262



40X-B	SEAR	P.L.
XC-13	SEAR	P.L.
XP-100	SEAR BLANK	P.L.
700BDL	SEAR	P.L.
700ADL	SEAR	P.L.
725	SEAR	D-24573
414	SEAR BLANK	C-16802
413	SEAR BLANK	C-16802
412-A	SEAR BLANK	C-16802
412	SEAR BLANK	C-16802
411-C	SEAR BLANK	P.L.
411-B	SEAR BLANK	C-10377
40XC	SEAR	P.L.
40-X	SEAR	P.L.
722	SEAR	H-17005?
721	SEAR	H-17005?
MODEL	PART USE	SEE

RECOMMENDED MATERIAL AND HEAT TREAT
MATERIAL C-1022 OR 1020
HEAT TREAT CYD. HDN. .005/.010 CASE
HARDNESS R15N 88/92
COLOR
HEAT TREAT AND COLOR TO BE DONE BY REMINGTON

DES'D BY DATE | DRAWN BY DATE [illegible] 5-23-62 | CHECK BY DATE [illegible] 8-15-62 | APPR. BY DATE W.[illegible]

TITLE SEAR

NUMBER ZC-17946 | SCALE 4:1 | SUPERSEDES—REFERENCE ZB-17946

REMINGTON ARMS CO. INC.
RESEARCH & DEV. DEPT.

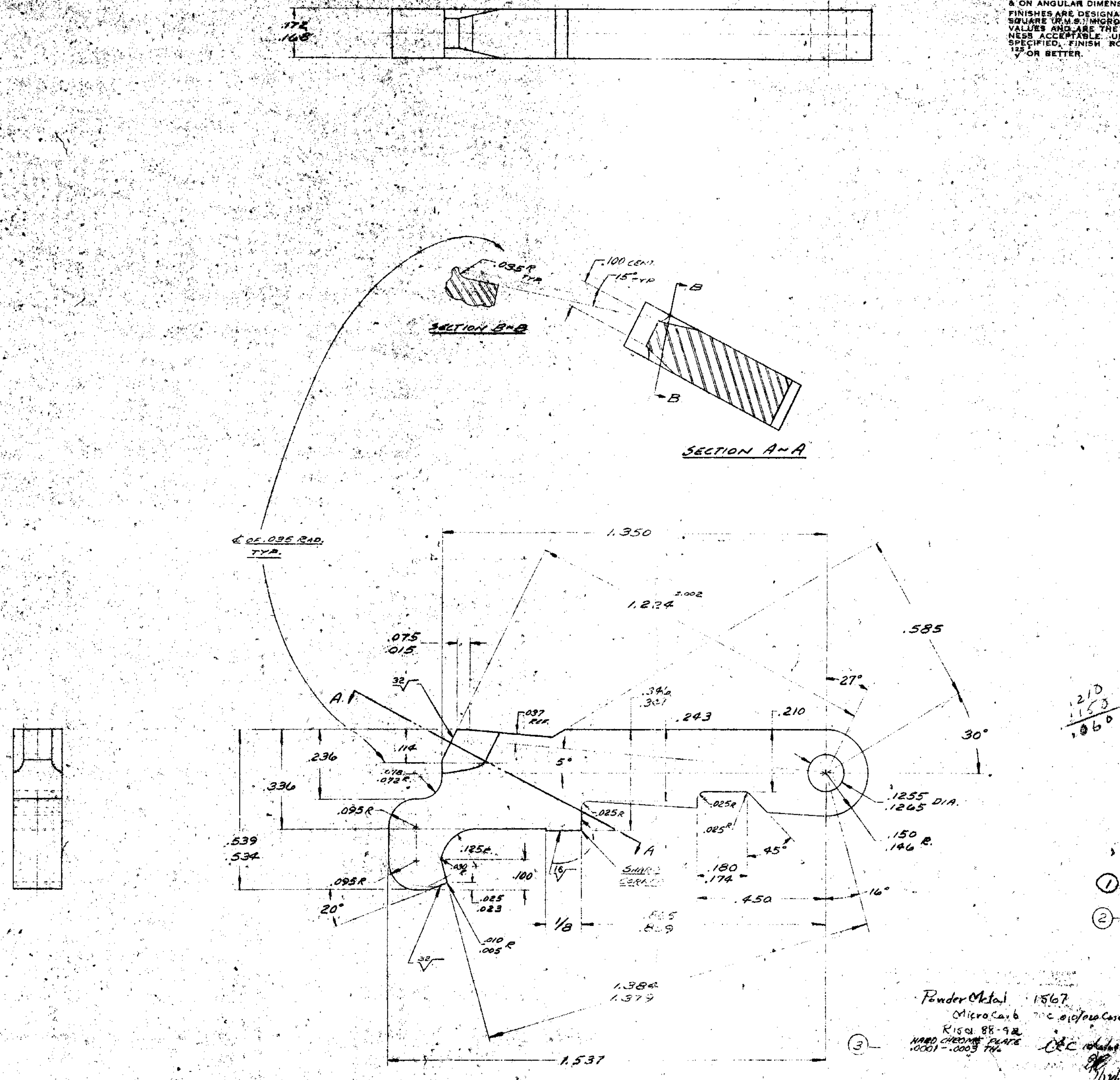
FORM TEC-1 Rev. 2

C-15066

DO NOT SCALE THIS DRAWING: WORK TO FIGURES
UNLESS OTHERWISE NOTED, TOLERANCES ON DECIMAL DIMENSIONS ARE ± .005
& ON FRACTIONAL DIMENSIONS ± 1/64
& ON ANGULAR DIMENSIONS ± 00°30'
FINISHES ARE DESIGNATED BY ROOT MEAN SQUARE (R.M.S.) MICRO-INCH ROUGHNESS VALUES AND ARE THE MAXIMUM ROUGHNESS ACCEPTABLE. UNLESS OTHERWISE SPECIFIED, FINISH ROUGHNESS TO BE 125 √ OR BETTER.

ALTERATIONS

LET.	WAS	REFERENCE	BY	DATE
1	ADD 456 660	6666	F.	4/1/66
2	ADD BLANK	6736	DD	3 JAN 67
3	.0008 / .0005	6736	DD	3 JAN 67



.210
.150
.060

FEB 8 1969

	MODEL	PART USE	QUAN.	
(1)	660	SEAR SAFETY CAM	1	P.L.
	700 VAR	SEAR SAFETY CAM	1	P.L.
(2)	40-XB	SEAR SAFETY CAM BLANK	1	P.L.
	600	SEAR SAFETY CAM	1	P.L.
	700 BDL	" "	1	P.L.
	700 ADL	" "	1	P.L.

Powder Metal 1567
Micro Carb TTC .010/.020 Case
Rc 88-92
(3) HARD CHROME PLATE .0001-.0003 TH.

DES'D BY DATE	DRAWN BY DATE	CHECK BY DATE	APPR. BY DATE
	Bosquet 10-29-64	10-29-64	4/1/65

TITLE: SEAR SAFETY CAM

NUMBER	SCALE	SUPERSEDES-REFERENCE
C-15066	4X	M 26530

REMINGTON ARMS CO. INC.
RESEARCH & DEV. DEPT.

FORM TFC-1 Rev. 2

NUMBER	REMINGTON ARMS CO. INC. RESEARCH & DEV. DEPT.		
A-16719	SCALE 4:1	REFERENCE - A-19461	
TITLE CONNECTOR			
DES. BY DATE	DRN. BY DATE PN 7-30-57	CHK. BY DATE R.S.J. 8/13/57	APP. BY DATE (R) 8-13-57

FOR DETAILS, SEE PROCESS RECORD

MODEL	PART USE	QUAN.	SEE	
40X	TRIGGER CONNECTOR			
40XCF	TRIGGER CONNECTOR	1	P.L.	1
40X-B	" "	1	P.L.	3

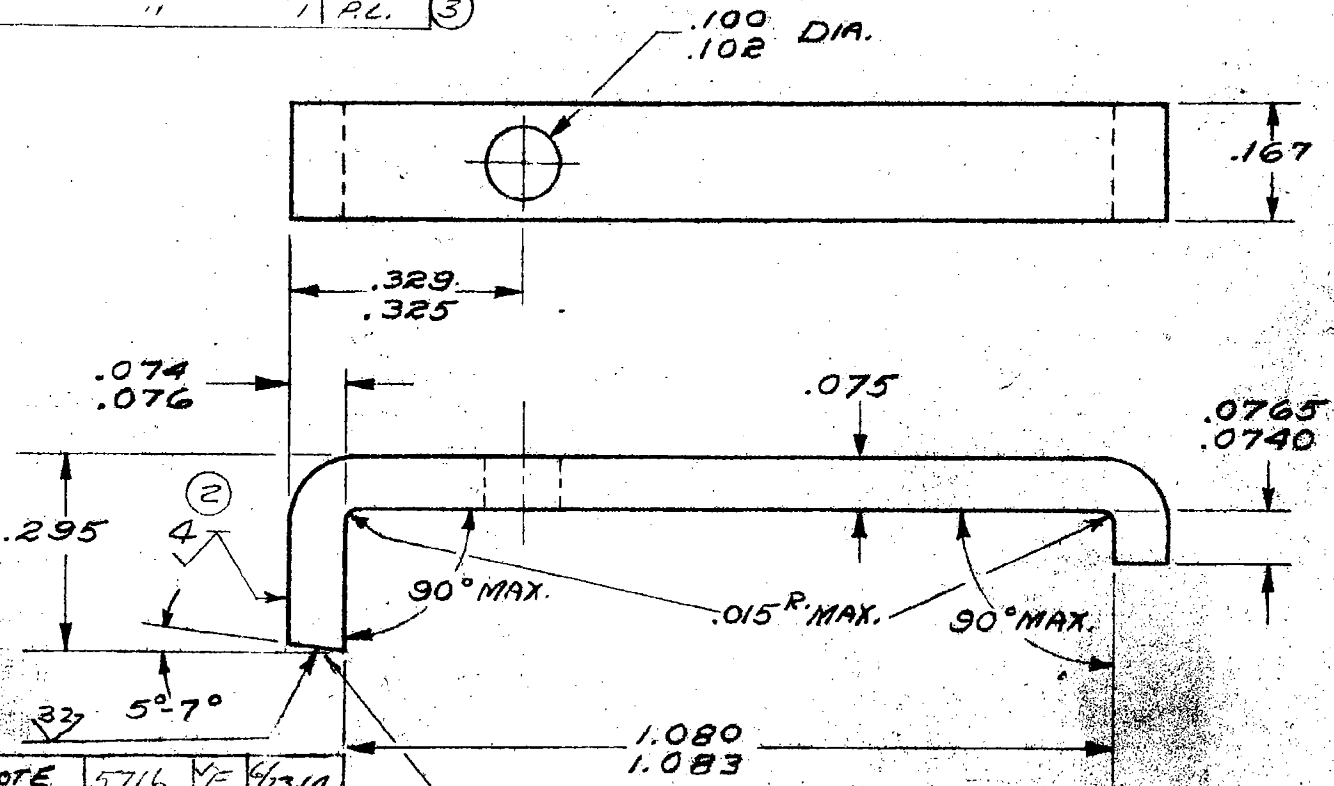
DO NOT SCALE THIS DRAWING: WORK TO FIGURES

UNLESS OTHERWISE NOTED, TOLERANCES ON DECIMAL DIMENSIONS ARE ±.005 & ON FRACTIONAL DIMENSIONS ± 1/64 & ON ANGULAR DIMENSIONS ± 00°-30' FINISHES ARE DESIGNATED BY ROOT MEAN SQUARE (R.M.S) MICRO-INCH ROUGHNESS VALUES AND ARE THE MAXIMUM ROUGHNESS ACCEPTABLE. UNLESS OTHERWISE SPECIFIED, FINISH ROUGHNESS TO BE 125 OR BETTER.

RECOMMENDED MATERIAL AND HEAT TREAT

MATERIAL C-1022 OR EQUIV.
HEAT TREAT CYANIDE .005/.010 CASE (4)
HARDNESS R15N 88-92
NONE

HEAT TREAT AND COLOR TO BE DONE BY REMINGTON



(5) NOTE: HEAT TREAT BEFORE GRINDING.

NOTE: THIS PART TO BE CHROME-PLATED.

NOTE: CHECK MATERIAL THICKNESS AFTER BENDING BY LOCATING ON BODY WITH LONG LEG RESTING ON SURFACE AT 90°. CHECK FROM 90° SURFACE TO TOP SURFACE OF LONG LEG.

ALT.	WAS	REFERENCE	BY	DATE
5	ADDED NOTE	5716	YF	6/23-64
4	ADDED H.T. SPECS.	5149	DEB	3-20-63
3	ADD USE 40X-B	5129	DEB	1-24-63
2	32	"	"	"
1	ADDED 40X C.F.	3941	DEB	7-15-60

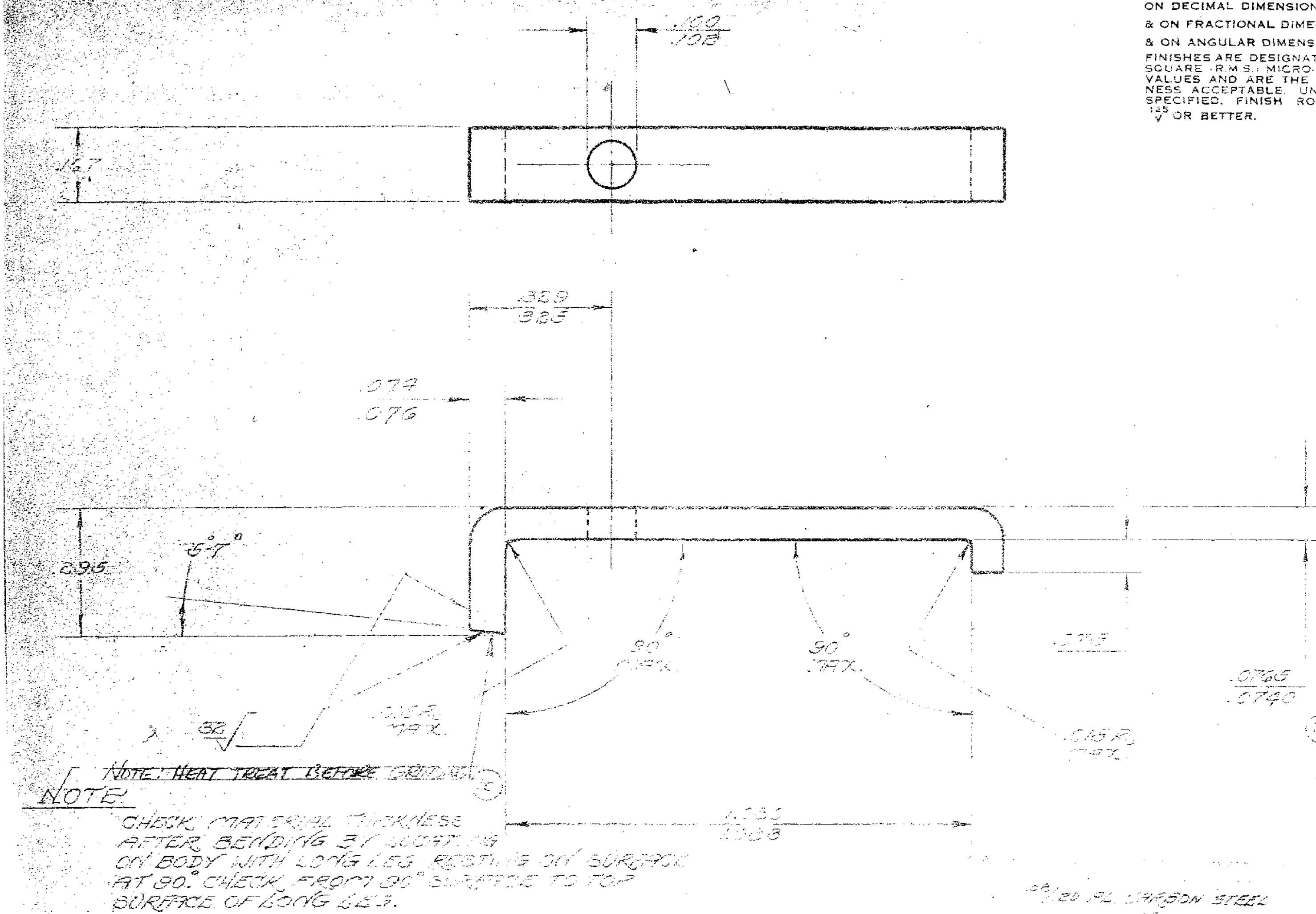
ALTERATIONS

77A-8 REV. 1

A-16719

(5)

B-19461



NOTE
CHECK MATERIAL THICKNESS AFTER BENDING BY LOCATING ON BODY WITH LONG LEG RESTING ON SURFACE AT 90°. CHECK FROM 90° SURFACE TO TOP SURFACE OF LONG LEG.

.080 FL. CARBON STEEL
C.H. .003 .008 CASE

DO NOT SCALE THIS DRAWING. WORK TO FIGURES
UNLESS OTHERWISE NOTED, TOLERANCES ON DECIMAL DIMENSIONS ARE ±.005 & ON FRACTIONAL DIMENSIONS ± $\frac{1}{64}$ & ON ANGULAR DIMENSIONS ±00°-30'
FINISHES ARE DESIGNATED BY ROOT MEAN SQUARE (R.M.S.) MICRO-INCH ROUGHNESS VALUES AND ARE THE MAXIMUM ROUGHNESS ACCEPTABLE. UNLESS OTHERWISE SPECIFIED, FINISH ROUGHNESS TO BE 125 OR BETTER.

ALTERATIONS

LET.	WAS	REFERENCE	BY	DATE
7	REDRAWN	4652		3-8-62
8	A-19461			
9	FILE HARD	5149		
10	ADDED NOTE	5716		4/23/64
11	ADDED SIZE	6479	DD	3-14-66

MODEL	PART USE	QUAN.	SEE
1100 INE	TRIGGER CONNECTOR		FL.
552	TRIGGER CONNECTOR		
742	TRIGGER CONNECTOR		
725	TRIGGER CONNECTOR		
722	TRIGGER CONNECTOR		
721	TRIGGER CONNECTOR		

DES'D BY DATE	DRAWN BY DATE	CHECK BY DATE	APPR. BY DATE
	3-8-62	7-9-62	AL 4/16/62

TITLE: CONNECTOR

NUMBER: B-19461 | SCALE: 4:1 | SUPERSEDES — A-19461

REMINGTON ARMS CO. INC.
RESEARCH & DEV. DEPT.

FB-1 REV. 2

cc: J.W. Brooks

Ilion, New York
July 11, 1966

MEMORANDUM

TO: C. B. Workman

FROM: A. A. Hugick

POWDER METAL ENDURANCE TESTING

A 100,000 cock-and-fire dry cycle test was run on the M/700 PM sear in the Measurement Lab dry cycle machine. The hardness of this sear was measured as 88.5 - R15N. Initial radius at the connector edge was measured as .0013" on the optical comparitor. The radius was measured as .0033" at the dry cycle test completion. All dry cycle testing was conducted with the sear lubricated with lubriplate.

Initial test trigger pull as adjusted by production was 4.55 lbs. During the dry cycle testing two firing pin tips broke. (@ 20,000 and 80,000).

AAH:c

Form R05845

REMINGTON ARMS COMPANY, INC.

ENGINEERING DEPARTMENT (DU PONT) COMPUTATION SHEET

SHEET NO 1

TITLE OF PROJ: PM SEAR ENDURANCE TEST

PROJ NO

SUBJECT

WORKS

COMPUTER WMC DATE 6/15 1966

1) GUN TESTED – M700 with new PM sear

A) Trigger pull at start of test

1 - 4.50
2 - 4.50
3 - 4.50 ave.
4 - 4.75
5 - 4.75

20000 – Firing pin broke during the 20000 cycles. Sear showed negligible rounding after inspection on optical comparator. New firing pin assembly

40000 – Sear ok.

61000 – Sear condition of – little change over ~~60000~~ 40,000 cycles – firing pin ok

Trigger pull (ave. of 5)

1 - 3.75
2 - 3.75
3 - 3.75
4 - 3.50
5 - 3.75

82000 – Broken firing pin tips over a period of ~~40000~~ 20,000 cycles [illegible]

100000 – Sear ok [illegible]

M100 PIN SEAR
100,000 COCK-AND-FIRE
DRY CYCLES - WELL
LUB.
88.5 - R15N
48.5 MEAS. RC.

.0013 RAD. AT
CONNECTOR - INITIAL

.0033 RAD. AT
CONNECTOR - TERMIN.

6-27-66 AAH.

cc: W.A. Leek
C.H. Morse
~~R.H. Walker~~
J.W. Brooks
~~M.J. Waterman~~
R.[illegible] Kelly

Ilion, New York
June 24, 1966

MEMORANDUM

TO: C. B. Workman

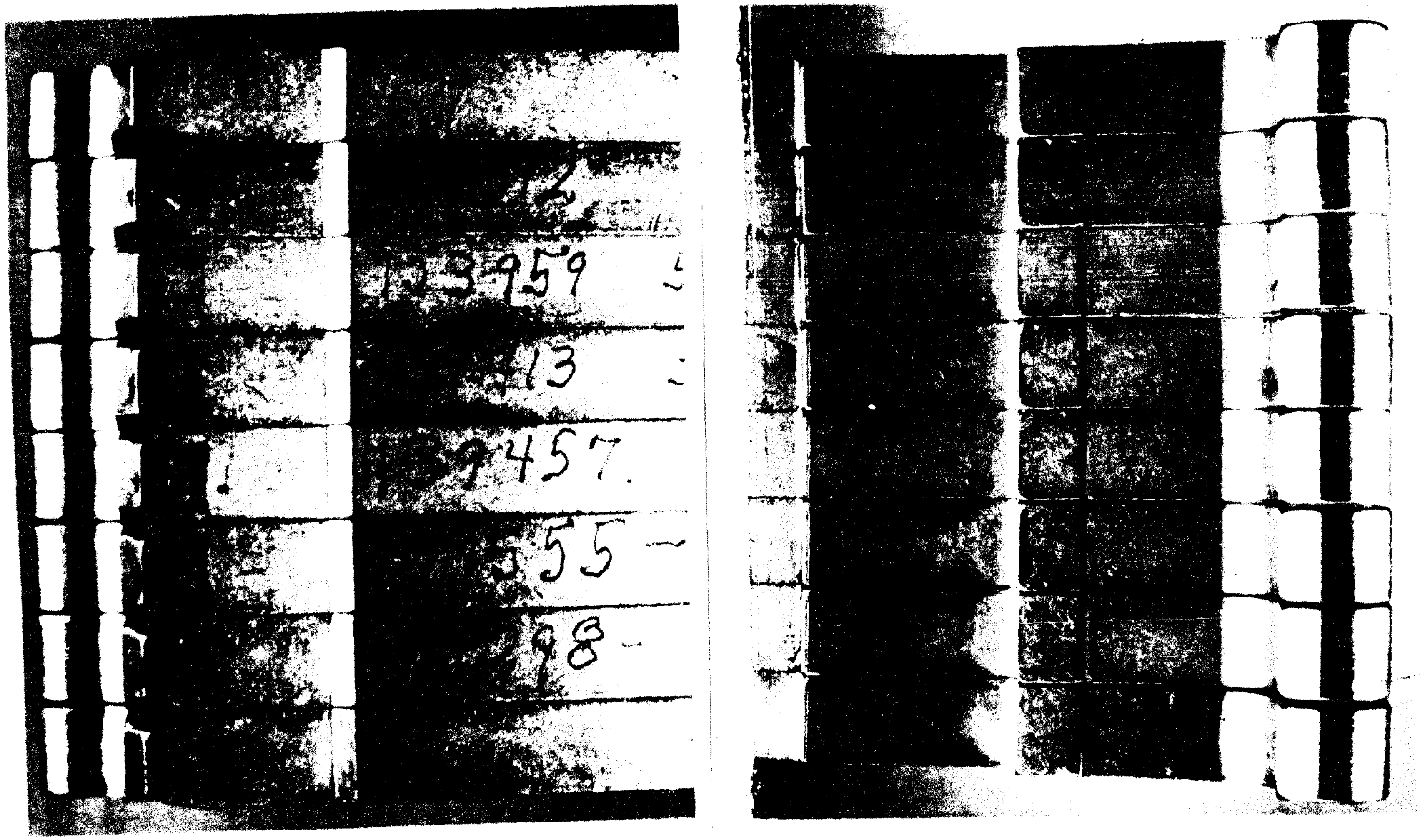
FROM: A. A. Mugick - W. M. Curry

Model 700 [illegible] POWDER METAL SEARS

Six M/700 rifles with powder metal sears were cock-and-fire dry cycled 30,000 cycles each in the Measurement Lab dry cycle machine for the purpose of establishing M/700 firing pin dry cycle life. The included test sears had a radius of approximately .003" on the connector surface edge when received from production. The average sear component weight was measured as 9.4021 grams. The average measured RC hardness was approximately 50 RC. All dry cycle testing was conducted with the sear well lubricated.

Enclosed is a photograph which best illustrates the lack of sear wear at the connector and cocking cam surfaces of the M/700 sears.

AAM:WMC:es
Enc.



MODEL 700 SEAR TEST

CHROME PLATED POWDER METAL SEAR

30,000 Cock and Fire Dry Cycle

AAH:WMC

6-7-66

Form RD5845

REMINGTON ARMS COMPANY, INC.

ENGINEERING DEPARTMENT DUPONT COMPUTATION SHEET

SHEET NO

TITLE OF PROJ M700 PROJ NO

SUBJECT FLASH CHROME PLATED PM WORKS

SEAR TESTING COMPUTER AAH DATE 6-8-66

SEAR NUMBER	TOTAL NUMBER OF CYCLES	SEAR RAD. AT CONNECTOR	SEAR COMPONENT WT	AVE. TRIGGER PULL AT END OF DRY CYCLING
153959	30,000	.0045	9.3685 gr	5.60 LBS
139298	30,000	.0035	9.4080 gr	7.70 LBS.
139413	30,000	.0050	9.4200 gr	4.60 LBS.
139555	30,000	.0068	9.3880 gr	5.70 LBS.
139312	30,000	.0029	9.4140 gr	5.35 LBS.
139457	30,000	.0053	9.431 gr	5.50 LBS.
NONE	000	.0035	9.385 GRAMS	
AVE		.0045	9.4021 GRAMS.	

AAH-6-8-66

J. Brooks

Ilion, New York
June 13, 1966

MEMORANDUM

To: C. B. Workman

From: A. A. Hupick - W. H. Curry

MODEL 700 COCK-AND-FIRE DRY CYCLE FIRING PIN LIFE

M/700 cock-and-fire dry cycle life testing was run in the Measurement Lab dry cycle machine. Each of Six M/700 actions were subject to a 30,000 dry cycle test. One firing pin tip failed at 20,000 dry cycles. The M/700 dry cycle test guns have been returned to the tester for further examination of parts.

Enclosed are the dry cycle testing observations and comments.

6/8/66
Latest test of one rifle with latest [illegible] (PA) the firing pin broke some place between 0 - 2000. New Firing pin put in + it broke between 55,000 + 60,000. New Firing pin put in + still ok at 100,000.

AAH:WMC:c
Encl.
6/8/66

P

WORK REQUEST

DATE REQUESTED 3-9-66 WORK ORDER E0262

DESIGNER OR ENGINEER J W Brooks

MODEL M700 CAL. OR GAUGE — BARREL TYPE —

TYPE OF TEST

NEW DESIGN ✓ DESIGN CHANGE ____

DRY CYCLE ✓ ACCURACY ____ HANDLOADING ____ STRESS ____

PRESSURE ____ MUZZLE VELOCITY ____ FUNCTION ____ PHOTOS ____

EVALUATION ____ BOLT VELOCITIES ____ OTHER ____

REPORT REQUIRED

FORMAL ____ INFORMAL ____ TEST RESULTS ONLY ✓

TEST OBJECTIVE

Firing Pin evaluation, Sear (chrome) + connector (chrome)

Start
1. check trigger pull.

5000 rds
1. check Firing Pin point for cracking or breaking.
2. visual check of Sear.

10000
1. Repeat 5000 cycle check

15,000
1. Repeat above checks

20,000
1. Repeat above checks

25,000
1. [illegible]

* Drop test after completion of dry cycle

GUNS REQUIRED

1 rifle SN 39413 new Fire control + Firing Pin assem. rifle from previous dry cycle of M sear test.

TEST COMPLETION DATE ____ SIGNED ____

M700 Firing Pin Evaluation
Test of M700 firing pin assembly + chrome sear by dry cycling
COMPUTER WMC DATE 3/21 19 66

This test was made on #139413 M700 to determine damage to the firing pin (breakage) and durability of the P.M. chromed sear. The gun was cocked and fired at a rate of one cycle every two seconds with inspection of the firing pin + sear every 5000 cycles.

BEGINNING OF TEST

1- Five trigger pulls taken at start of test.

The fire control was cleaned		6.25
+ deburred before test.		6.25
	ave - 6.30 lbs	6.25
		6.50
		6.25

2- The sear stuck down at 4,750 cycles (cleaned + oiled firecontrol.

3- 5000 cycles: sear shows light wear but no deformation.
On examination of the firing pin the shoulder shows an uneven seat in the front of the bolt body. The firing pin tip shows heavy chopping against the firing pin hole.

4- 5,370 cycles: cocking cam had to be lubricated because of excessive force required to cock the action. (dry cycle machine jammed)

5- Shoulder of bolt has picked up small pieces of metal and seats unevenly in bolt body. Firing pin tip shows increased rubbing around the tip.

M700 Firing Pin Evaluation Test

WMC 3/21 66

11,680 cycles
6 – Action failed to cock due to excessive wear on cocking cam; replaced bolt body and took trigger pull. 5.25
5.25
5.00 ave. - 5.25 lbs
5.50
5.25

7) 15,000: The firing pin assembly seats more evenly in the sleeve bolt body. The area around the tip shows little additional wear. No change in condition of the sear.

8 – 20,000: The magnaflux process shows no cracks; visual inspection the same. The sear shows little change over 15000 cycles.

9 – 25,000: A second magnaflux inspection shows no cracks. A visual inspection indicates a very small place in the tip of the firing pin which looks ready to chip.

Trigger pull at 25000 cycles

4.25
4.50
4.75 ave - 4.60 lbs.
4.75
4.75

REMINGTON ARMS COMPANY, INC.
ENGINEERING DEPARTMENT COMPUTATION SHEET SHEET 3

SUBJECT: M 700 Firing Pin evaluation Test

COMPUTED WMC DATE 3/21 1966

Summary:

The M700 firing pin assembly under test showed no other faults than already mentioned and no cracks or breakage could be located by the magnaflux process or by visual inspection under the low power microscope. The worst area of wear seemed to be on the last .150 of the firing pin tip. One other change occured when the new bolt made a different seat on the firing pin shoulder. The second bolt was a more even seat.

Other than slight rubbing the sear seems in good condition, however the trigger pull decreased 1.70 lbs in the 25,000 cycles.

REMINGTON ARMS COMPANY, INC.

ENGINEERING DEPARTMENT COMPUTATION SHEET SHEET NO

TITLE OF PROJ Firing Pin Evaluation test PROJ NO

SUBJECT WORKS

COMPUTER WMC DATE 5/1/66 19

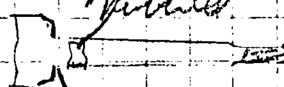
Continuation of firing pin dry cycle

Gun # 139555

Start of test (trigger pull) 5.0
5.0
5.0 Ave. 5.15
5.5
5.25

5000 - Wear spots in the area of three places have shown up on the pin assembly

rubbed rubbed

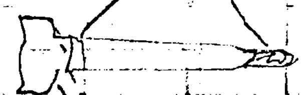


bright spot on shoulder

Sear ok

10,000 Wear spots have increased slightly on firing pin assembly

wear

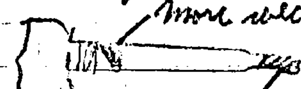


wear

Sear ok

15,000 Rubbed spots don't show much increase over 10,000 cycles. Rubbed area in front of shoulder shows slight enlargement.

more wear

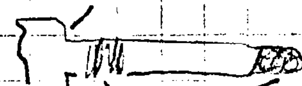


Sear shows normal wear

shoulder area same worn bright

20000 increased wear on parts of pin originally showing wear.

seat mark



increased wear

REMINGTON ARMS COMPANY, INC.

ENGINEERING DEPARTMENT COMPUTATION SHEET

TITLE OF PROJ: M700 Firing Pin Evaluation

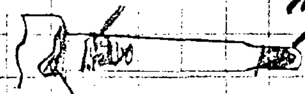
PROJ NO

WORK

SUBJECT

COMPUTER: WMC DATE: 5/4/66

25,000 No additional wear visible around the tip of pin. Rubbed section ahead of shoulder has increase of wear. On back of shoulder has light rub mark



30,000 No failures; magnaflux process finds no cracks

No excessive wear on sear

Average of 5 trigger pulls 5.70 lbs

*Note increase of trigger pull on this gun is contrast to the usual decrease over the 30000 cycle test.

REMINGTON ARMS COMPANY, INC.

ENGINEERING DEPARTMENT COMPUTATION SHEET SHEET NO. 1

M700 Firing Pin Evaluation test

PROJ. NO.

WORKS

COMPUTER WMC DATE 4/20 19 66

Continuation of firing pin-sear evaluation test

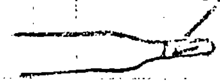
Trigger pull (start of test) Gun # 139312

5.5
5.0 Ave. 5.45 lbs
5.5
5.75
5.5

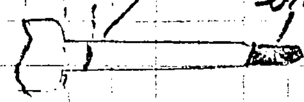
Cocking cam + out side bolt surface lubricated

5000 - light wear around firing pin tip

Sear OK



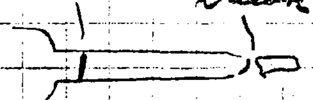
10,000 Metal rubbing (visible) around firing pin tip. Rubbed spot shows about .075 forward of shoulder



Sear OK

15000 - No noticeable change in wear condition

20000 - Tip of the pin broke around the rubbed portion caused by firing pin hole



Sear shows no excessive wear

20,000 - end of test (trigger pull ave. of 5)

5.35 lbs

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KINZER V. REMINGTON

R2538575

REMINGTON ARMS COMPANY, INC.

ENGINEERING DEPARTMENT COMPUTATION SHEET SHEET No.

TITLE OF PROJ M700 Firing pin Duration test PROJ No.

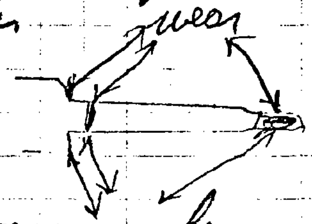
SUBJECT WORK

COMPUTER WMC DATE 5/24/66 19

Serial # 139298

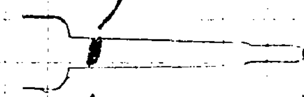
Start of test (trigger pull) 6.00
5.75
5.50 ave 5.85
6.00
6.00

5000 - beginning gall spots on tip shoulder & .100 in front of shoulder

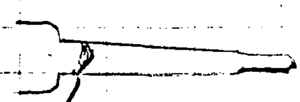


10000 - Slight increase over 5000 cycles

15000 Wear increased forward of shoulder slightly increase



20000 Wear increased forward of shoulder; tip & shoulder show a very slight increase in wear



expanded wear area
mostly on one side

25000 considerable increase in wear .100 forward of shoulder

REMINGTON ARMS COMPANY, INC.

ENGINEERING DEPARTMENT COMPUTATION SHEET

M700 Firing pin Evaluation Test

PROJ. NO.

WORKS

COMPUTER DATE

30000 – No breakage – magnaflux indicates no cracks.

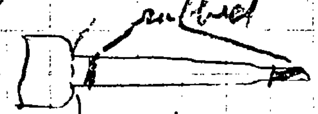
Trigger pull (ave of 5) – 6.25
7.50 ave 7.7 lb
8.00
8.75
8.00

TITLE OF PROJ M700 Firing pin Evaluation test PROJ. NO.
SUBJECT WORK
COMPUTER DATE 4/18/66 19

Continuation of firing pin + sear dry cycle test (gun # 153595)

Trigger pull before start of test. 6.75
6.00 ave. 6.15 lbs
6.25
5.75
6.00

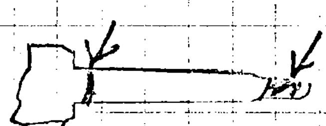
5000 - all normal wear spots rubbed bright



Sear ok

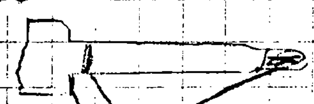
pin seat worn bright

10,000 - all worn spots increasing



Sear light rub marks no deformation

15000 Little visible increase over 10000 cycles
Wear has occurred in the same places as in the other tests.



Sear ok. visible wear spots
(no increase over 10,000)

REMINGTON ARMS COMPANY, INC.

ENGINEERING DEPARTMENT COMPUTATION SHEET

SHEET

TITLE OF PROJ 11700 Firing pin Evaluation test

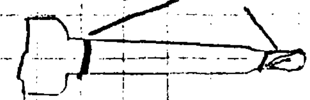
SUBJECT continued Gun # 153959

PROJ NO

WORKS

COMPUTER DATE 19

20000 - Wear area ground pin tip + in front of shoulder have increased



Sear brightened but shows no deformation.

25000 - No cracks no weight change in the last 5000 cycles
Sear shows no deformation

30,000 - End of test with no failure of firing pin or sear

Trigger pull ave at end of test - 5.60 lbs.

REMINGTON ARMS COMPANY, INC.

ENGINEERING DEPARTMENT COMPUTATION SHEET

SHEET NO. 1

TITLE OF PROJ. Firing Pin Evaluation Test

SUBJECT

COMPUTER CWMC DATE 4/1/66

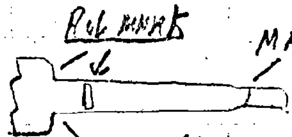
This is a dry cycle test to determine the strength of the firing pin assembly against breakage for 30,000 dry cycle firings. The guns used in this test will be cocked and fired by a machine once every 2 seconds.
The sear assembly will also be checked for undue wear.

GUN # 139467

Trigger pull before test: 5.75
6.00 Ave. - 5.75
5.50
6.25
6.25

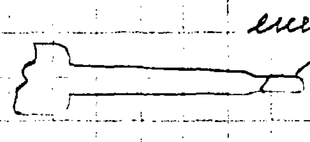
5000 cycles - no cracking of firing pin. Light wear around the tip of firing pin is the only sign of wear.
Sear shows bright spots but no wear.

10,800 - Tips shows scrub marks & area of firing pin seat shows even but noticeable bright marks



The sear is only rubbed bright in area of contact with no excessive wear.

15,200 - Tip shows heavy metal scrubbing; other areas of wear show no increase since 10800



- No excessive wear to sear.

REMINGTON ARMS COMPANY, INC.

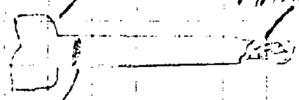
ENGINEERING DEPARTMENT COMPUTATION SHEET

TITLE OF PROJ. M 700 Firing Pin Evaluation

SUBJECT G# 139457

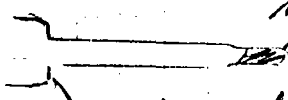
COMPUTER RMC DATE 4/7/66

20300 cycles increasing wear around the firing pin tip shoulder area notes little change

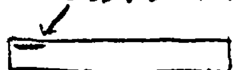


No excessive wear to sear

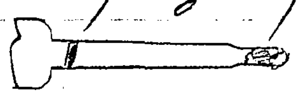
25,000 cycles wear around firing pin tip looks about the same as 20300 cycles. Shoulder has formed a light circle around the seating area



Sear shows more rubbing on the left top than on other exposed parts.



30000 - Magnaflux report shows no cracks; visual inspection - no cracks



Little change in looks over 25000 cycles
No visible change in sear
Trigger Pull (end of test)
Ave. of 5 - 5.5 lbs

REMINGTON ARMS COMPANY, INC.

ENGINEERING DEPARTMENT COMPUTATION SHEET 1

Firing Pin Evaluation Test

COMPUTED BY CWMC DATE 4/1/66

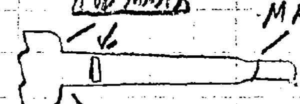
This is a dry cycle test to determine the strength of the firing pin assembly against breakage for 30,000 dry cycle firings. The guns used in this test will be cocked and fired by a machine once every 2 seconds.
The sear assembly will also be checked for undue wear — Chrome plated Production [illegible].

GUN # 139457

Trigger pull before test: 5.75
6.00 Ave. - 5.75
5.50
6.25
6.25

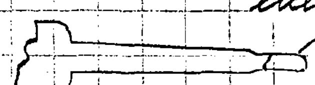
5000 cycles - no cracking of firing pin.
Light wear around the tip of firing is the only sign of wear.
Sear shows bright spot but no wear.

10,800 - Tip shows scrub marks. Area of firing pin seat shows wear but noticeable bright marks



The sear is only rubbed bright in areas of contact with no excessive wear.

15,200 - Tip shows heavy metal scrubbing; other areas of wear show no increase over 10800
excessive wear



- No excessive wear to sear

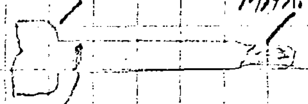
REMINGTON ARMS COMPANY, INC.

ENGINEERING DEPARTMENT COMPUTATION SHEET 2

M 700 Firing Pin Evaluation

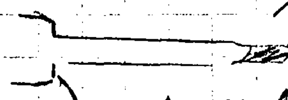
G# 139457 COMPUTED BY RWMC DATE 4/7/66

20300 cycles - increasing wear around the firing pin tip. shoulder area notes little change

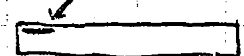


No excessive wear to sear

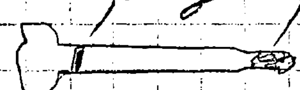
25,000 cycles wear around firing pin tip looks about the same as 20308 cycles. Shoulder has formed a light circle around the seating area



Sear shows more rubbing on the left top than on other exposed parts.



30000 - Magnaflux process shows no cracks; visual inspection - no cracks



Little change in looks over 25000 cycles
No visible change in sear

Trigger Pull (end of test)

Ave. of 5 - 5.5 lbs

WORK REQUEST

DATE REQUESTED 3-9-66 WORK ORDER E0262

DESIGNER OR ENGINEER J W Brooks

MODEL M700 CAL. OR GAUGE — BARREL TYPE —

TYPE OF TEST

NEW DESIGN ✓ DESIGN CHANGE ______

DRY CYCLE ✓ ACCURACY ____ HANDLOADING ____ STRESS ____

PRESSURE ____ MUZZLE VELOCITY ____ FUNCTION ____ PHOTOS ____

EVALUATION ____ BOLT VELOCITIES ____ OTHER ______

REPORT REQUIRED

FORMAL ______ INFORMAL ______ TEST RESULTS ONLY ✓

TEST OBJECTIVE

Firing Pin evaluation, Sear (chrome) + connector (chrome)

start
1. check trigger pull.

5000 rds
1. check Firing Pin joint for cracking or breaking.
2. visual check of sear

10,000
1. Repeat 5000 cycle check

15,000
1. Repeat above check

20,000
1. Repeat above check

25,000
1. Repeat above check

GUNS REQUIRED

1 rifle SN 39415 - new Fire control & Firing Pin assem.
rifle from previous dry cycle for sear test.

TEST COMPLETION DATE ______ SIGNED ______

CONFIDENTIAL-SUBJECT TO PROTECTIVE ORDER
KINZER V. REMINGTON

R2538584

Form FD5845

REMINGTON ARMS COMPANY, INC.

ENGINEERING DEPARTMENT (DU PONT) COMPUTATION SHEET Sheet No. 1

Title of Proj. M 700 Firing Pin Evaluation Proj. No.

Subject Test of M 700 firing pin assembly + chrome sear by dry cycling Work

Computer W McC Date 3/21 66

This test was made on # 139413 M700 to determine damage to the firing pin (breakage) and durability of the P.M. chromed sear. The gun was cocked and fired at a rate of one cycle every two seconds with inspection of the firing pin + sear every 5000 cycles.

BEGINNING OF TEST

1- Five trigger pulls taken at start of test.

6.25

The fire control was cleaned 6.25

+ deburred before test. avg - 6.30 lb 6.25

6.50

6.25

2- The sear stuck down at 4,750 cycles (cleaned + oiled firecontrol).

3- 5000 cycles: sear shows light wear but no deformation.

On examination of the firing pin the shoulder shows an uneven seat in the front of the bolt body. The firing pin tip shows heavy chopping against the firing pin hole.

4- 5,370 cycles: cocking cam had to be lubricated because of excessive force required to cock the action. (dry cycle machine jammed)

5- Shoulder of bolt has picked up small pieces of metal and seats unevenly in bolt body. Firing pin tip shows increased rubbing around the tip.

Form 1D3845

REMINGTON ARMS COMPANY, INC.

ENGINEERING DEPARTMENT — COMPUTATION SHEET — SHEET NO. 2

TITLE OF PROJ: M700 Firing Pin Evaluation Test — PROJ. NO.

SUBJECT — WORK

COMPUTER: WMC — DATE: 3/21 1966

11,680 cycles
6 - Action failed to cock due to excessive wear on cocking cam; replaced bolt body (No. 10111.7) and took trigger pull: 5.25
5.25
5.00 ave.-5.25 lbs
5.50
5.25

7) 15,000: The firing pin assembly seats more evenly in the new bolt body. The area around the tip shows little additional wear. No change in condition of the sear.

8-20,000: The magnaflux process shows no cracks; visual inspection the same. The sear shows little change over 15000 cycles.

9-25,000: A second magnaflux inspection shows no cracks. A visual inspection indicates a very small place in the tip of the firing pin which looks ready to chip.

Trigger pull at 25,000 cycles

4.25
4.50
4.75 ave-4.60 lbs.
4.75
4.75

CONFIDENTIAL-SUBJECT TO PROTECTIVE ORDER
KINZER V. REMINGTON

Form RD-3945

REMINGTON ARMS COMPANY, INC.

ENGINEERING DEPARTMENT DUPONT COMPUTATION SHEET SHEET NO. 3

TITLE OF PROJ.: M 700 Firing Pin evaluation Test PROJ. NO.

SUBJECT WORK

COMPUTER WMC DATE 3/21 66

Summary:

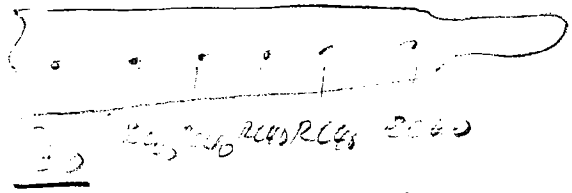
The M700 firing pin assembly under test showed no other faults than already mentioned and no cracks or breakage could be located by the magnaflux process or by visual inspection under the low power microscope. The worst area of wear seemed to be on the last .150 of the firing pin tip. One other change seemed when the new bolt made a different seat on the firing pin shoulder. The second bolt was a more worn seat.

Other than light rubbing the sear seems in good condition, however the trigger pull decreased 1.70 lbs in the 25,000 cycles.

3-2-66

Per K. Chadwick

The firing pin that broke at shoulder was checked for hardness & was ok running as follows



It was approx RC 40 from tip back almost to the shoulder & then it dropped to RC 20. These parts are heat treated only on the points. The two other Firing Pins that looked cracked from magnaflux & under the glass. one broke & one cracked further when bent, material is ok. Kelly will run micro if necessary but at this time it does not seem necessary

M700 SEAR TEST
FIRING PIN BREAKAGE AND
DRY CYCLE NUMBER

Broken Firing Pin

X 139555 pm ✓ — 25,000 FIRING PIN BREAKAGE
— 33,000 TOTAL CYCLES ON GUN

139 298 mark ok — 21,000 FIRING PIN LAST CHECKED OKAY
— 21,000 TOTAL CYCLES ON GUN

139609 mark ok — 21,000 FIRING PIN LAST CHECKED OKAY
— 21,000 TOTAL CYCLES ON GUN

154225 — 10,000 FIRING PIN LAST CHECKED OKAY
— 10,000 TOTAL CYCLES ON GUN

X 139413 pm ✓ — 26000 FIRING PIN LAST TESTED OKAY
— 29000 TOTAL CYCLES ON GUN

X 139457 pm ck ✓ — 30,000 FIRING PIN LAST CHECKED OKAY
Broken at shoulder 70,000 TOTAL CYCLES ON GUN

139312 pm ck OK — 30,000 FIRING PIN LAST CHECKED OKAY
— 70,000 TOTAL CYCLES ON GUN

X 153959 std Prod ✓ — 10,000 FIRING PIN LAST CHECKED OKAY
— 50,000 TOTAL CYCLES ON GUN

AAH
2/24/66

REMINGTON ARMS COMPANY INC.
COMPUTATION SHEET

M700 SEAR TEST
FIRING PIN BREAKAGE AND DRY CYCLE NUMBER

~~139555~~	- 25,000	FIRING PIN BREAKAGE X
	- 33,000	TOTAL CYCLES ON GUN
139298 OK	- 21,000	FIRING PIN LAST CHECKED OKAY
	- 21,000	TOTAL CYCLES ON GUN
139609 OK	- 21,000	FIRING PIN LAST CHECKED OKAY
	- 21,000	TOTAL CYCLES ON GUN
154225	- 10,000	FIRING PIN LAST CHECKED OKAY
	- 10,000	TOTAL CYCLES ON GUN
139413	- 26000	FIRING PIN LAST TESTED OKAY
	- 29000	TOTAL CYCLES ON GUN
139457	- 30,000	FIRING PIN LAST CHECKED OKAY
	70,000	TOTAL CYCLES ON GUN
139312 OK	- 30,000	FIRING PIN LAST CHECKED OKAY
	- 70,000	TOTAL CYCLES ON GUN
153959	- 10,000	FIRING PIN LAST CHECKED OKAY
	- 50,000	TOTAL CYCLES ON GUN

John
We should give Workman a test rifle or two with known firing pins when he tests the production F/P sears
[illegible]

AAH
2/24/66

11-22-65

Mike
Paul Acoy
Kelly Chalmers
Clarke
Adam
Vic DeHues

9 AM Monday
Nov. 22

1. Release Chromed P.M. Sears to production if there are no more tests to run., For M700 & 6a

2. A. When new parts are run with corrected dies test will be run to see if $\$0 \times B$ can be included.

B also test parts impregnated with oil as one of tests to determine if sears can be used without chrome plate.

C. Section parts with discolored surface to see what discolored surface is.

Kelly to get new PM Sears made up + tumbled & plated. Decision as to what is to be done will be made at that time. Opinion seems to be that sear is ok + can be released to production however it should be kept track of once it is released to make sure there are no complaints because of trigger pull etc because of PM [illegible]

RD 6565

EST, #2502

ESTIMATED SAVINGS & RETURN ON INVESTMENT

PROPOSEL ONE PIECE POWDER METAL BLANK
M/XP-100, 600 & 700 SEAR SAFETY CAM ASSY

		1965 Year of Operation			
		PRESENT (2) PIECE CONSTR.	PROPOSED (1) PIECE STAMPING PROPOSAL "A"		PROPOSED (1) PIECE POWDER METAL BLANK PROPOSAL "B"
Quantity Forecast	XP-100 1,200 M/600 15,000 M/700 32,000	48,200			
OPERATING COSTS					
Purchased parts		$ 2750	$ 1,620	$	$
Raw material					400
Direct Labor		6,840	4,470		1,190
Industrial Relations @ 33%		2,260	1,490		390
Supplies Tool Replacement Cutter Grind Tool Maintenance Maintenance		680	1,110		1,080
Electricity			2390		3060
Equipment Depreciation @ 10%		—	710		—
Franchise Tax @ 4%			130		380
		$12,530	$ 9520	$	$ 3,440
SAVINGS IN OPERATING COST			$3,010		$9090
Less: All other expense: All Other 65%; Federal Tax 48%			1,550		4,670
NET SAVINGS			$ 1,460		$ 4420
INVESTMENT					
Project expenditures			$ 7,100		$ —
Manufacturing and working facilities					
Net Change in working capital			(2,000)		(5450)
Total capital required for this project			$ 5,100		($ 5,450)
RETURN ON INVESTMENT - THIS PROJECT			28.6%		NO CAPITAL INVESTMENT

* * * * * * * * * * * * * * *

Return on total capital required including research and development and other operation charges	VENDOR TOOLING OPER. CHGES	$2,400 $ 3,900 $ 11,400 12.8%	P/M TOOLING $1,600 400 ($3450) NET DECREASE IN TOTAL CAPITAL
Return on total additional investment after completion of this project			

(Subdivision 5)

FG CARLSON
10/15/64

CONFIDENTIAL-SUBJECT TO PROTECTIVE ORDER
KINZER V. REMINGTON

R2538592

1C-17946

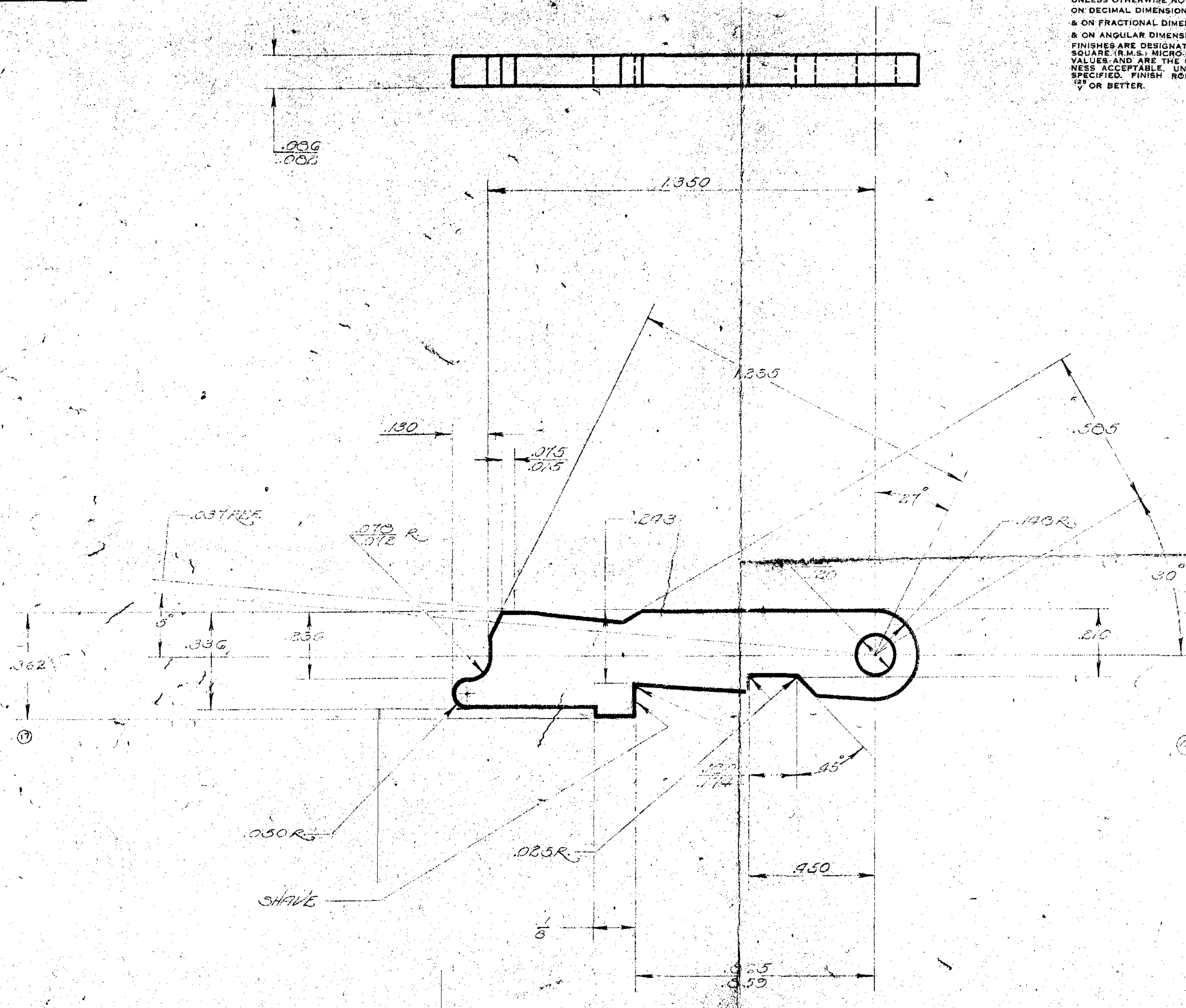
DO NOT SCALE THIS DRAWING: WORK TO FIGURES

UNLESS OTHERWISE NOTED. TOLERANCES ON DECIMAL DIMENSIONS ARE ± .005 & ON FRACTIONAL DIMENSIONS ± $\frac{1}{64}$ & ON ANGULAR DIMENSIONS ± 00°-30'

FINISHES ARE DESIGNATED BY ROOT MEAN SQUARE (R.M.S.) MICRO-INCH ROUGHNESS VALUES AND ARE THE MAXIMUM ROUGHNESS ACCEPTABLE. UNLESS OTHERWISE SPECIFIED. FINISH ROUGHNESS TO BE $\sqrt{}^{125}$ OR BETTER.

ALTERATIONS

LET.	WAS	REFERENCE	BY	DATE
14	REDRAWN	4862	GR	8-13-62
15	1B-17946	"	GR	"
16	ADDED 40X-B	5129	JKB	1-29-63
17	.347	5779	JWB	7-23-64



C-1022 OR 1020

MODEL	PART USE	QUAN.	SEE
(17) 40X-B	SEAR BLANK	1	1C-17946
600	SEAR BLANK		1C-17946
40-XCF	SEAR BLANK		1C-17946
40-X	SEAR BLANK		1C-17946
414	SEAR BLANK		1C-17946
413	SEAR BLANK		1C-17946
412-A	SEAR BLANK		1C-17946
412	SEAR BLANK		1C-17946
411-C	SEAR BLANK		1C-17946
411-B	SEAR BLANK		1C-17946
700BDL	SEAR BLANK		1C-17946
700ADL	SEAR BLANK		1C-17946
725	SEAR BLANK		1C-17946
722	SEAR BLANK		1C-17946
721	SEAR BLANK		1C-17946

DES'D BY DATE	DRAWN BY DATE	CHECK BY DATE	APPR. BY DATE
—	L. REED 8-13-62	JK 8-13-62	WLG 8-20-62

TITLE: SEAR, BLANK

(14) (15)

NUMBER	SCALE	SUPERSEDES--REFERENCE
1C-17946	4:1	1B-17946

REMINGTON ARMS CO. INC.
RESEARCH & DEV. DEPT.

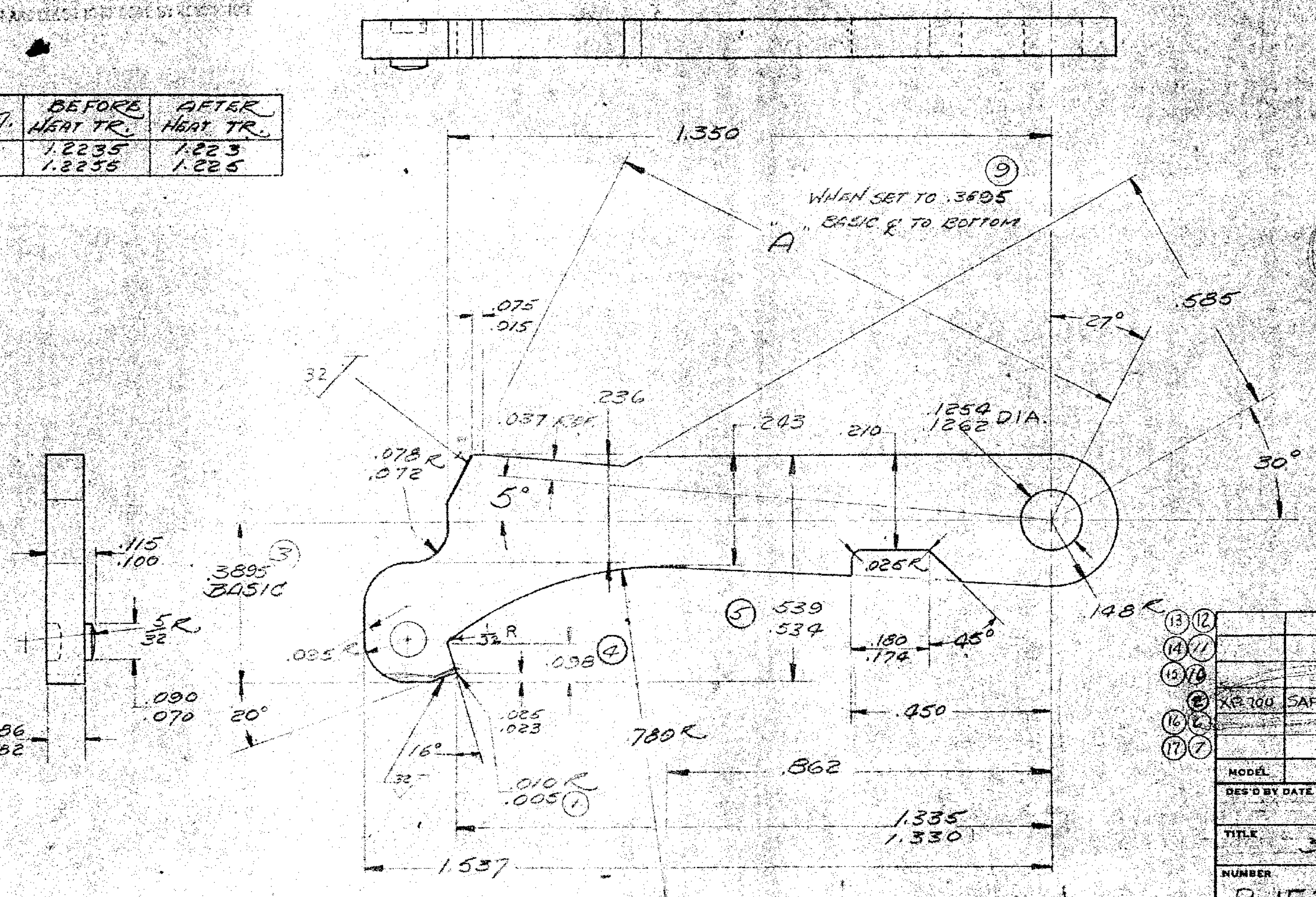
B-15369

C-1022
See N-26590

DO NOT SCALE THIS DRAWING - WORK TO FIGURES
UNLESS OTHERWISE NOTED, TOLERANCES ON DECIMAL DIMENSIONS ARE ±.005 & ON FRACTIONAL DIMENSIONS ±1/64 & ON ANGULAR DIMENSIONS ±0°-30'
FINISHES ARE DESIGNATED BY ROOT MEAN SQUARE (R.M.S.) MICRO-INCH ROUGHNESS VALUES AND ARE THE MAXIMUM ROUGHNESS ACCEPTABLE. UNLESS OTHERWISE SPECIFIED, FINISH ROUGHNESS TO BE 125 OR BETTER.

(8) NOTE
USE BLANK - 18-17945

DIM.	BEFORE HEAT TR.	AFTER HEAT TR.
"A"	1.2235 1.2255	1.223 1.225



ALTERATIONS

SYM.	WAS	RECORD	BY	DATE
1	ADDED .010 R .005	4316		
2	ADDED	4041		
3	.3815	4443		
4	.090	"	"	"
5	.531/.526	"		
6	700 ADL	"	"	"
7	700 A	"	"	"
8	ADDED	4445	"	
9	.3815	"	"	"
10	ADDED XC-13	4499		
11	ADD USE 40X-B	5180		
12	ADD USE	6479	DD	3-14-66
13	700 VAR.	6509	DD	22APR66
14	40X-B	"	"	"
15	600	"	"	"
16	700 ADL	"	"	"
17	700 BDL	6509	DD	22APR66

MODEL	PART USE	QUAN.	REF.
(13)(12)			
(14)(11)			
(15)(10)			
(8) XP700	SAFETY CAM BLANK		
(16)(6)			
(17)(7)			

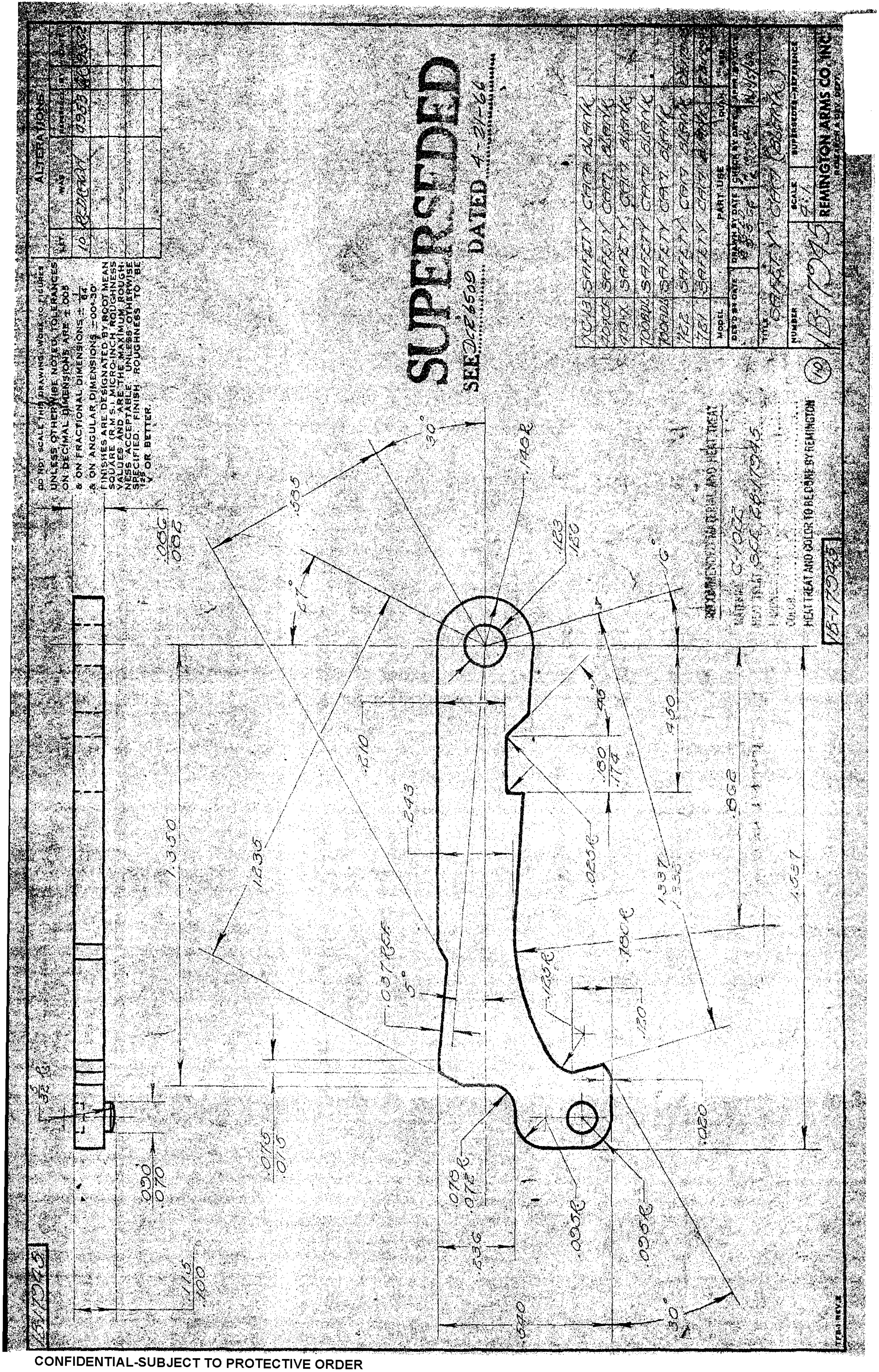
DES'D BY DATE | DRAWN BY DATE 6-22-61 | CHECK BY DATE R.J.B. 7-7-61 | APPR. BY DATE

TITLE SAFETY CAM

NUMBER B-15369 | SCALE 4X | SUPERSEDES - REFERENCE

REMINGTON ARMS CO. INC.

TFB-1 REV. 2


ALTERATIONS
SUPERSEDED
SEE DCE6500 DATED 4-21-66
DO NOT SCALE THIS DRAWING. WORK TO FIGURES
UNLESS OTHERWISE NOTED, TOLERANCES ON DECIMAL DIMENSIONS ARE ± .005
& ON FRACTIONAL DIMENSIONS ± 1/64
& ON ANGULAR DIMENSIONS ± 00°-30'
FINISHES ARE DESIGNATED BY ROOT MEAN SQUARE (R.M.S.) MICRO-INCH ROUGHNESS VALUES AND ARE THE MAXIMUM ROUGHNESS ACCEPTABLE. UNLESS OTHERWISE SPECIFIED, FINISH ROUGHNESS TO BE 125 OR BETTER.
MATERIAL C-1020
HEAT TREAT SEE 2BW17945
HEAT TREAT AND COLOR TO BE DONE BY REMINGTON
SAFETY CAM (BLANK)
B-17945
REMINGTON ARMS CO., INC.

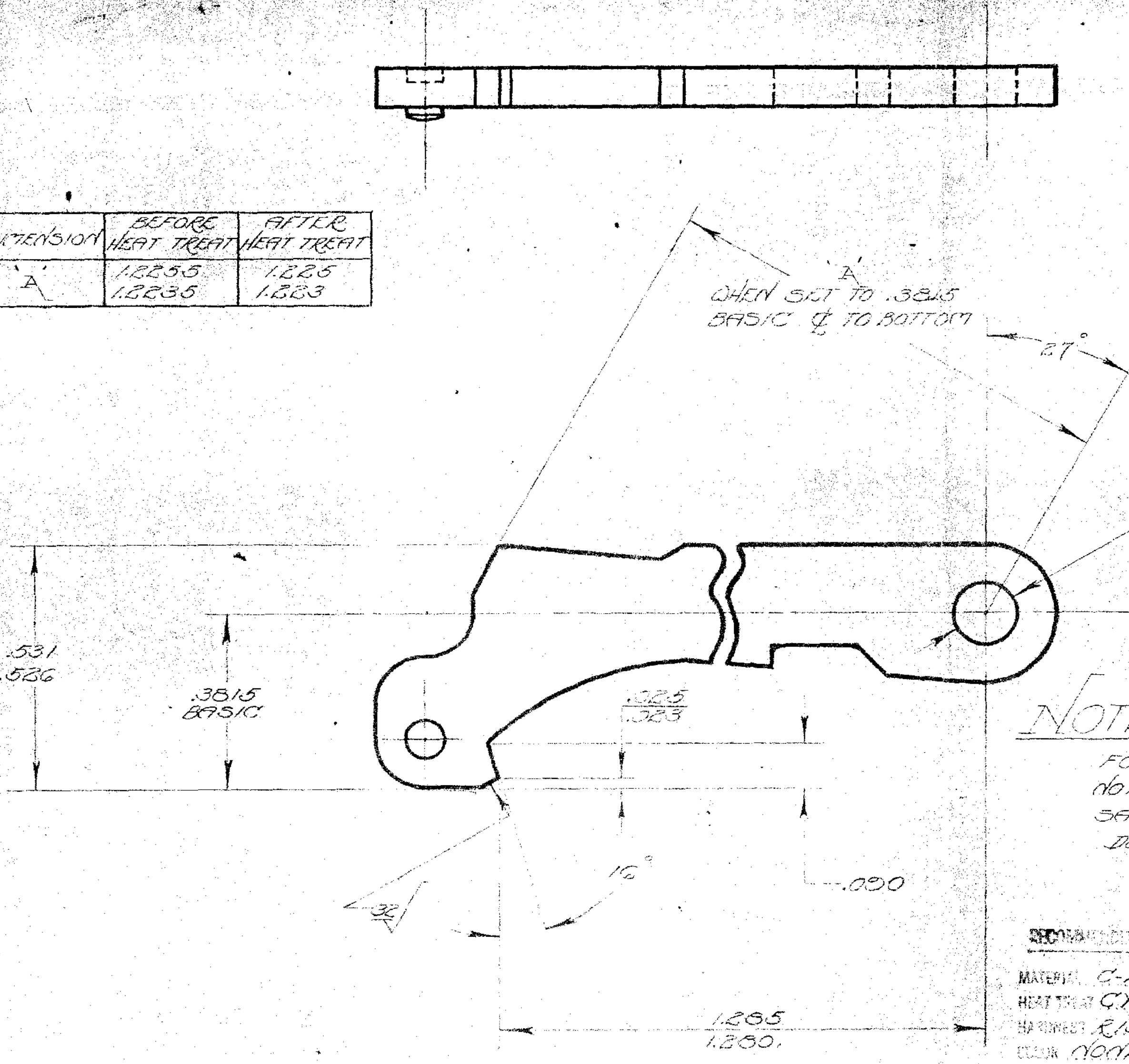
2B-17945

DO NOT SCALE THIS DRAWING. WORK TO FIGURES
UNLESS OTHERWISE NOTED. TOLERANCES ON DECIMAL DIMENSIONS ARE ±.005 & ON FRACTIONAL DIMENSIONS ± 1/64 & ON ANGULAR DIMENSIONS ±00°-30'
FINISHES ARE DESIGNATED BY ROOT MEAN SQUARE (R.M.S.) MICRO-INCH ROUGHNESS VALUES AND ARE THE MAXIMUM ROUGHNESS ACCEPTABLE UNLESS OTHERWISE SPECIFIED. FINISH ROUGHNESS TO BE 125 OR BETTER.

ALTERATIONS

LET.	WAS	REFERENCE	BY	DATE
18	REDRAWN	9353	GR	9-6-62

DIMENSION	BEFORE HEAT TREAT	AFTER HEAT TREAT
'A'	1.2255 1.2235	1.226 1.223



SUPERSEDED
SEE Rev. 19 5149 DATED 3-26-63

NOTE
FOR DIMENSIONS NOT SHOWN, SEE SAFETY CAM BLANK DWG. 1B-17945.

RECOMMENDED MATERIAL AND HEAT TREAT
MATERIAL C-1022
HEAT TREAT CYANIDE
HARDNESS R15N 89-90
COLOR NONE
HEAT TREAT AND COLOR TO BE DONE BY REMINGTON

MODEL	PART USE	QUAN.	SEE
40XCR	SAFETY CAM		P.L.
40-X	SAFETY CAM		P.L.
722	SAFETY CAM		P.L.
721	SAFETY CAM		P.L.

DES'D BY DATE	DRAWN BY DATE	CHECK BY DATE	APPR. BY DATE
	G REED 9-6-62	ᴴR 10-1-62	WL 10/5/62

TITLE SAFETY CAM

NUMBER	SCALE	SUPERSEDES—REFERENCE
(18) 2B-17945	4:1	

REMINGTON ARMS CO. INC.
RESEARCH & DEV. DEPT.

FB-1 REV. 2

2B-17945

2-B-17945

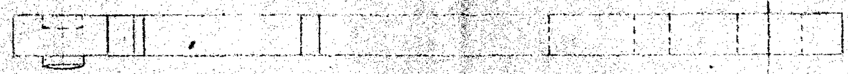
RECOMMENDED MATERIAL AND HEAT TREAT
MATERIAL SEE 1B-17945
(16) HEAT TREAT C4A1110E
HARDNESS R 15N 80-90
COLOR NONE
HEAT TREAT AND COLOR TO BE DONE BY REMINGTON

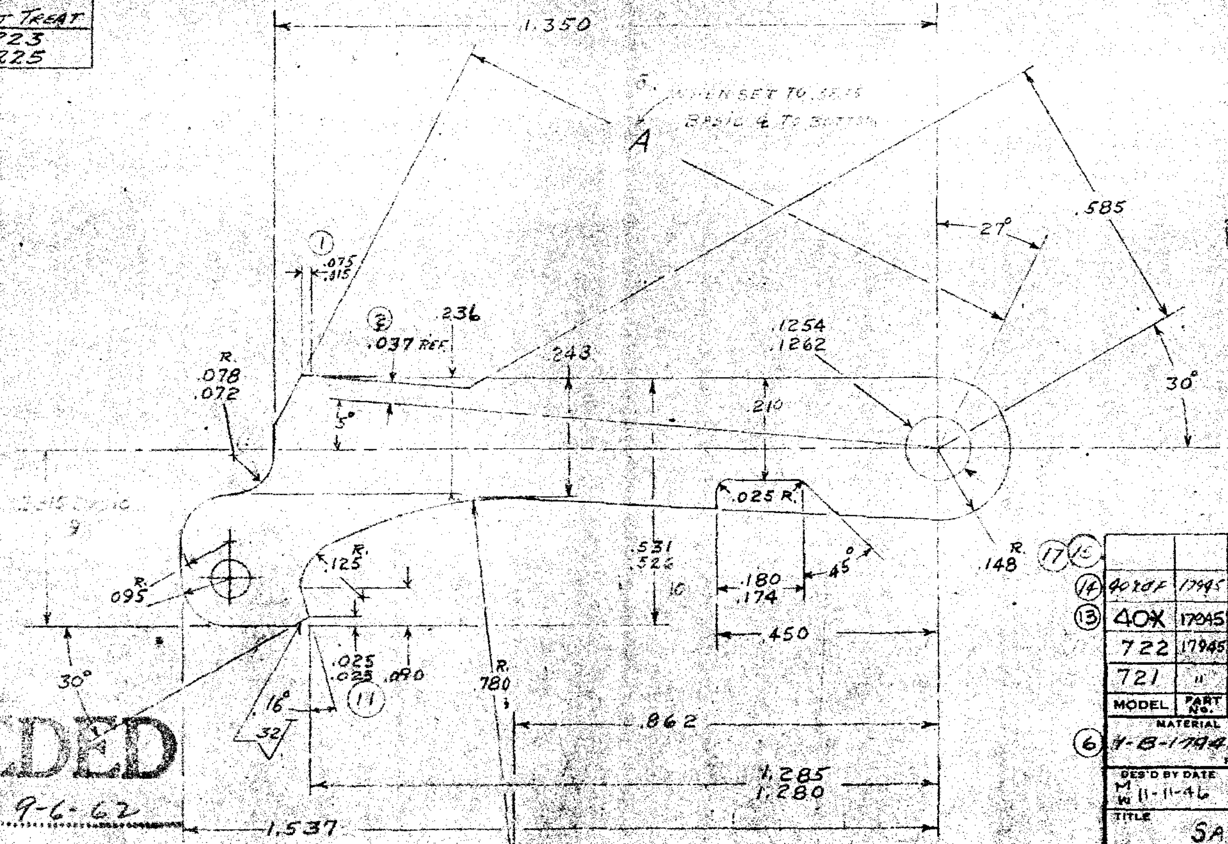
DO NOT SCALE THIS DRAWING: WORK TO FIGURES
UNLESS OTHERWISE NOTED, TOLERANCES ON DECIMAL DIMENSIONS ARE ±.005 & ON FRACTIONAL DIMENSIONS $\pm\frac{1}{64}$
FINISHES ARE DESIGNATED BY ROOT MEAN SQUARE (R.M.S) MICRO-INCH ROUGHNESS VALUES AND ARE THE MAXIMUM ROUGHNESS ACCEPTABLE. UNLESS OTHERWISE SPECIFIED, FINISH ROUGHNESS TO BE $\overset{125}{\vee}$ OR BETTER.

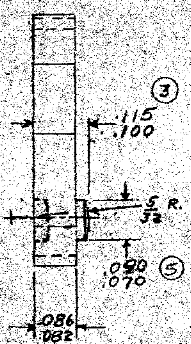
ALTERATIONS				
LET.	WAS	REFERENCE	BY	DATE
1	ADDED	900103	L.R.	2-12-47
2	.049 - .043	" "	L.R.	2-12-47
3	.025	" 100	"	2-21-47
4	B-17945	" "	"	2-21-47
5	.070 - .080	" "	MW	2-24-47
6	AISI-C1118	" "	"	"
7	D-17036Y		L.R	7-16-47
8	ADDED NOTE		L.R.	7-21-47
9	ADDED BASIC		L.R.	"
10	[illegible]		L.R	"
11	.020	222060	MW	9-8-48
12	Added	OCR 141	MW	11-29-51
13	ADDED	DCR 427	MW	5-8-53
14	ADDED	3941	FB	7-15-60
15	" [illegible]	4217	"	6-1-61
16	" [illegible]	"	"	"
17	REMOVED M-700	4295	"	7-[illegible]-61

(12)

DIMENSION	BEFORE HEAT TREAT	AFTER HEAT TREAT
A	1.2235 1.2255	1.223 1.225







SUPERSEDED
SEE 2-B-17945 DATED 9-6-62
Rev. 18
#4953

(17)(15)					
(14) 40XBF	17945	SAFETY CAM	1	FB	P.X
(13) 40X	17945	SAFETY CAM		MW	P.L.
722	17945	SAFETY CAM		L.R	[illegible]
721	"	SAFETY CAM		L.R	[illegible]
MODEL	PART No.	PART USE	QUAN.	LIST BY	SEE

MATERIAL	HEAT TREATMENT	SURFACE TREATMENT
(6) 1-B-17945	.005 - .010 CASE	NONE

FOR DETAILS, SEE PROCESS RECORD

DES'D BY DATE	DRAWN BY DATE	INDEX BY DATE	CHECK BY DATE
MW 11-11-46	L.R. 1-17-47		MW 1-2[illegible]

TITLE SAFETY CAM — APPR. BY DATE [illegible]

NUMBER	SCALE	REFERENCE
(4) 2-B-17945	4 X SIZE	O

THE REMINGTON ARMS CO. [illegible]

2-B-17945

10/26/65

Chromed P. M. Sears - Tests to be completed after they cycle tests are completed?

1. Drop test.

2. Dust test. (Wet) ? (#15) Run with control sample.

3. Creep

4. Safety mechanism shock test. (#9)

5. No lubrication test (#16). Done in census

6. Field test (#18)

7. Defective ammo. (Punctured primer etc.) (#20)

8. Safety Mechanism Function Test (#22)

not necessary!

Test 40 X B with new Chrom. PM sears + Connectors checks to see that load stays constant thru any cycle.

P.M. Sear test

1. Wash P.M. sear in tri-clean.
2. " connector in Tri-clean
3. assemble into Fire control without touching mating surfaces or cam surface.
4. wash Firing Pin head sear cam surface.
5. adjust trigger pull within spec. if possible.
6. Take 5 readings of spring force at trigger pull.
7. " " " " trigger pull.
8. Dry cycle rifle (close interval approx. 5 sec.)
9. Check 5 reading of trigger pull.
10. check surfaces for visual.
11. If rust appearing & heavy enough have part sectioned to check to see if it is rust.
12. If not heavy enough run more dry cycle to build up more surface for checking.

Keily

1. Present sears are lapped before + after chrom.

2. S.A. Sears have very small or line or connector contact surface.

3. What consistent weight should be checked for?

1. 3# to start with.
2. 1# to start with.
3. 3# for testing.
4. 1# after testing.

P. M. Sears

Impregnated with oil instead of chrome plated.

1. [illegible] lint & dust pick up in too great?

2. wear of surface?

3. cost saving over chrome?

4.

1. Have new sears made up with corrected dies.

2. Chrome parts for test.

3. Cost to chrome.

4. Oil impregnated parts for test.

5. cost to impregnate with oil.

6.

zinc phosphate

mang. phosphate

6-7-65

Asked Markley setting up ? controls on 8 rifles. 2 with Production ?
2 " P.M. "
2 " " " Chrome Plated
2 " machined sears + higher trigger .021

.021 higher trigger is to allow for .021 lower pad on machined sear.

About to be tested by Clark Workman when rifles are assembled.

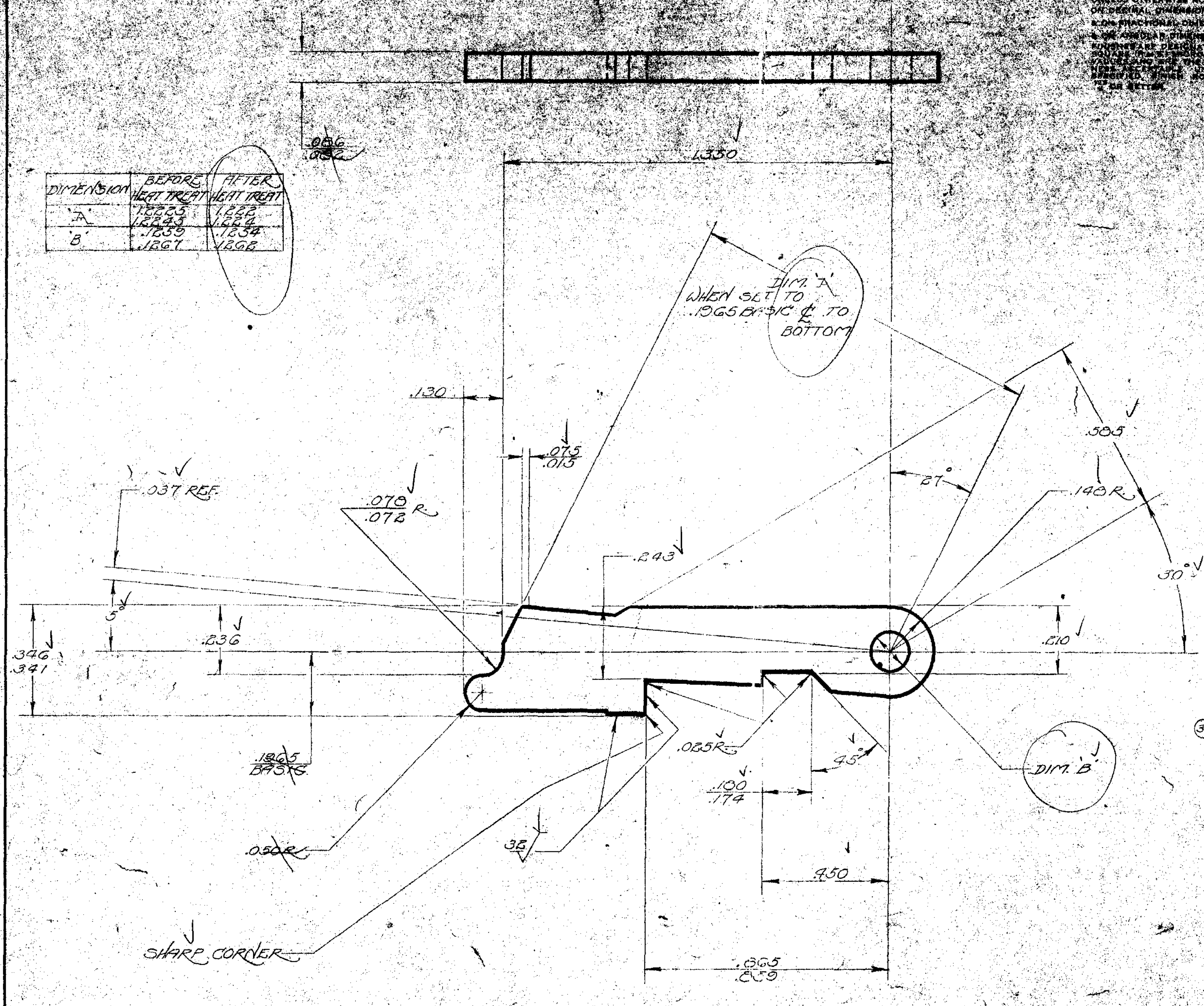
9-8-65

Adam Hagick has 5000 rounds on Std, PM chromed, & PM sears. Machined sears dropped from test at start. PM sears dropped because of high trigger pull at ? rounds. PM chromed + std sears to run to 10,000 cycles then reevaluate to see if further testing should be done.

Run std + PM chromed sears to 50,000 cycles.

Test completed 10- -65 PM chromed sear good. Run other function tests on it.

ZC-17946



DIMENSION	BEFORE HEAT TREAT	AFTER HEAT TREAT
'A'	.12225 / .12245	.1222 / .1224
'B'	.1259 / .1267	.1234 / .1268

MODEL	PART USE		SUPR.
40X-B	SEAR		P.L.
XC-13	SEAR		P.L.
XP-100	SEAR	BLANK	P.L.
700BDL	SEAR		P.L.
700ADL	SEAR		P.L.
725	SEAR		D24575
414	SEAR	BLANK	C16802
413	SEAR	BLANK	C16802
412-A	SEAR	BLANK	C16802
412	SEAR	BLANK	C16802
411-C	SEAR	BLANK	P.L.
411-B	SEAR	BLANK	C16377
40XCF	SEAR		P.L.
40-X	SEAR		P.L.
722	SEAR		H-17657
721	SEAR		H-17657

RECOMMENDED MATERIAL AND HEAT TREAT

MATERIAL C-1022 OR 1020

HEAT TREAT CYN. HDN. .005/.010 CASE

HARDNESS R/15N 89/92

COLOR

HEAT TREAT AND COLOR TO BE DONE BY REMINGTON

DRAWN BY DATE: 3-29-62 · CHECKED BY DATE: 4-18-62 · APPROVED BY: W.J.

TITLE: SEAR

NUMBER: ZC-17946 · SCALE: 4:1

REMINGTON ARMS CO. INC.

FORM TFC-1 Rev. 2

12/18/78

John Brooks

Per M/D Change # DCR 10586 - we are grinding flat - not at 6°

Any question please call on contact -

[illegible signature]

[illegible initials]

1. What type of Fixture?
2. Could it be altered to grind at 5°
Gerry will let us know 1/9/79
Yes it can be

D-6738 G. J. Hill

DCR # 10586

Sheet 1 of 1

DESIGN CHANGE REQUEST (DCR)

~~PARTS LIST CHANGE NOTICE (PLCN)~~

~~OR~~

~~PARTS LIST TRANSMITTAL~~

~~TRANSMITTAL of DRAWINGS / PARTS LIST~~

To Stfgnd Talbe 1/17

Requested By	Changed By	Date
RESEARCH	F. MARTIN	9 JAN 78

Originating Date	Transmittal Date
	1-10-78

Model	Part Name / List	Drawing No.	Part No.
M-700	SEAR SAFETY CAM	C-15666	
M-600	SEAR SAFETY CAM	C-91470	

Dwg. No.	Rev. No.	Design Change
C-15666	12	CHGD. "AFTER GRIND" TO "BLANK DIM"
"	13	ADD .866-.890 AFTER GRIND
C-91470	9	CHG'D. "AFTER GRIND" TO "BLANK DIM"
"	10	ADD .866-.890 AFTER GRIND

Reason for Change: FOR BETTER DIMENSIONAL CONTROL OF PARTS AND IMPROVE CHARACTERISTICS OF TRIGGER ASSEMBLY BY INSURING SHARP CORNER AFTER GRIND.

Disposition of Parts on Hand (check below)

( ) Scrap ( ) Alter ( ) Use Inventory

(PLCN) Use form below if part number is changed / add - used, or superseded.

	Drawing No.	Part No.	Part Name
Current Listing			
New Listing			
Current Listing			
New Listing			

NOTE: Please mark your Parts List to agree ( )

( ) Superseded Part is Obsolete (check disposition below)

( ) Use Up ( ) Scrap ( ) Service Repair ( ) Other Model Use

( ) New Part is: ( ) Steel ( ) Powder Metal ( ) Assembly ( ) Wood ( ) Purchased ( ) Other

APPROVED: John W Brooks 1/11/78

RD-6738 G. J. Hill

DESIGN CHANGE REQUEST (DCR)

~~PARTS LIST CHANGE NOTICE (PLCN)~~

~~OR~~

~~PARTS LIST TRANSMITTAL~~

To Stoffel/albe 1/17

~~TRANSMITTAL of DRAWINGS / PARTS LIST~~

DCR # 10532

Sheet 1 of 1

Requested By	Changed By	Date
Research	F. Martin	9-Jan 78

Originating Date	Transmittal Date
	1-10-78

Model	Part Name / ~~List~~	Drawing No.	Part No.
M-700	Sear Safety Cam	C-15666	
M-600	Sear Safety Cam	C-91490	

Dwg. No.	Rev. No.	Design Change
C-15666	12	Chg'd. "After Grind" To "Blank Dim."
"	13	Add .866-.870 After Grind
C-91490	9	Chg'd. "After Grind" To "Blank Dim."
"	10	Add .866-.870 After Grind

Reason for Change: For Better Dimensional Control Of Parts And Improve Characteristics Of Trigger Assembly By Insuring Sharp Corner After Grind.

6-29-78 New Fixture Ready For Tryout

Disposition of Parts on Hand (check below)

( ) Scrap ( ) Alter ( ) Use Inventory

(PLCN) Use form below if part number is changed / add – used, or superseded.

	Drawing No.	Part No.	Part Name
Current Listing			
New Listing			
Current Listing			
New Listing			

NOTE: Please mark your Parts List to agree ( )

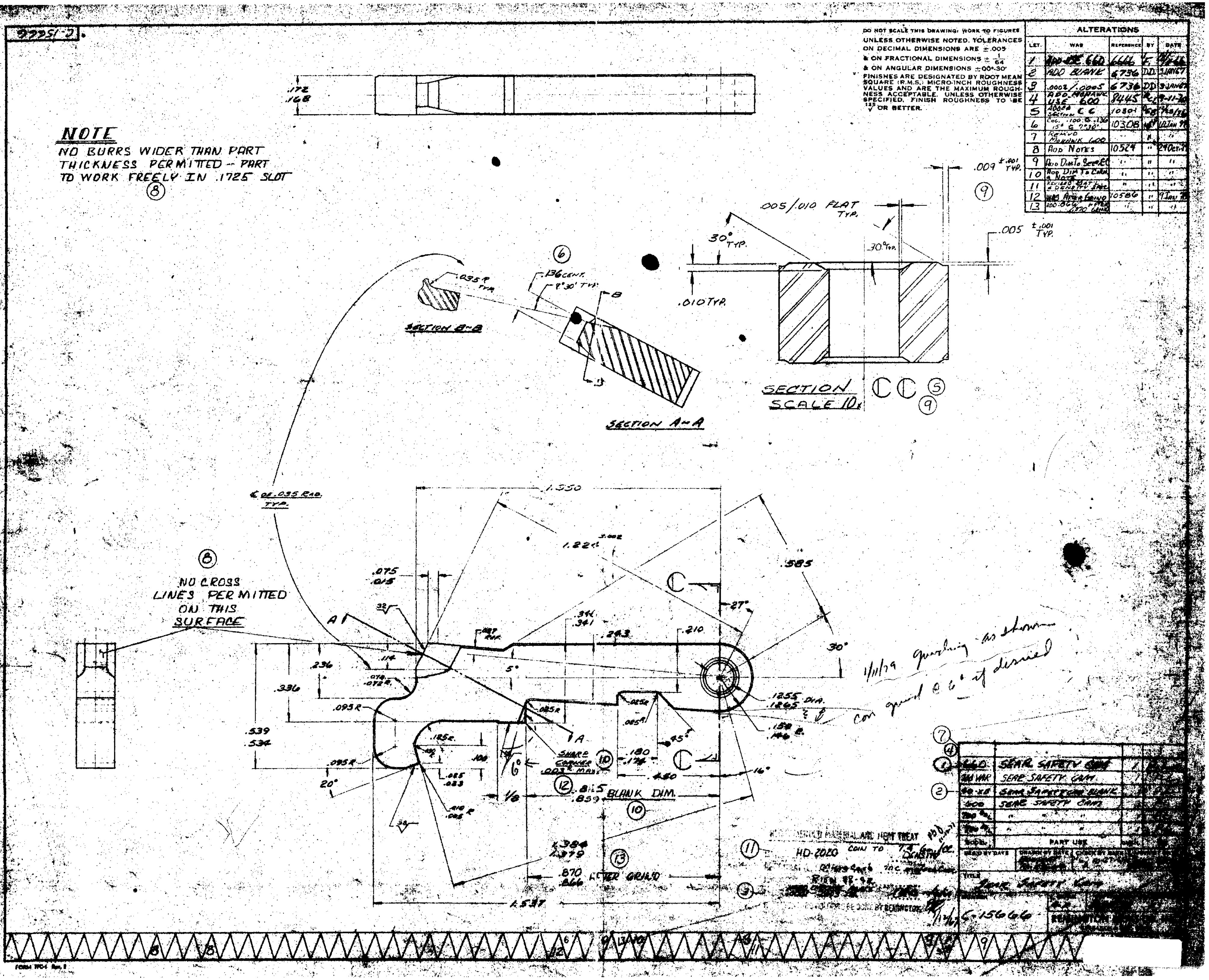
( ) Superseded Part is Obsolete (check disposition below)

( ) Use Up ( ) Scrap ( ) Service Repair ( ) Other Model Use

( ) New Part is: ( ) Steel ( ) Powder Metal ( ) Assembly ( ) Wood ( ) Purchased ( ) Other

APPROVED: [illegible signature] ______ ____

CONFIDENTIAL-SUBJECT TO PROTECTIVE ORDER
KINZER V. REMINGTON


C-15666
DO NOT SCALE THIS DRAWING; WORK TO FIGURES
UNLESS OTHERWISE NOTED, TOLERANCES ON DECIMAL DIMENSIONS ARE ±.005
& ON FRACTIONAL DIMENSIONS ± 1/64
& ON ANGULAR DIMENSIONS ±00°-30'
FINISHES ARE DESIGNATED BY ROOT MEAN SQUARE (R.M.S.) MICRO-INCH ROUGHNESS VALUES AND ARE THE MAXIMUM ROUGHNESS ACCEPTABLE. UNLESS OTHERWISE SPECIFIED, FINISH ROUGHNESS TO BE 125 OR BETTER.
ALTERATIONS
LET. WAS REFERENCE BY DATE
1 ADD 660 6666
2 ADD BLANK 6736 DD
3 .0002/.0005 6736 DD
4 ADD MOHAWK USE 600 8445
5 ADDED SECTION C C 10801
6 10308
7 REMOVED MOHAWK 600
8 ADD NOTES 10524
9 ADD DIM TO SEC. C C
10 ADD DIM TO CAM & NOTE
11 REVISED MAT'L & DENSITY SPEC
12 WAS AFTER GRIND 10586
13 ADD .866
NOTE
NO BURRS WIDER THAN PART THICKNESS PERMITTED — PART TO WORK FREELY IN .1725 SLOT
NO CROSS LINES PERMITTED ON THIS SURFACE
SECTION B-B
SECTION A-A
SECTION C C SCALE 10x
.005/.010 FLAT TYP.
30° TYP.
.010 TYP.
.009 ±.001 TYP.
.005 ±.001 TYP.
.136 CENT.
.035 R TYP.
℄ OF .035 RAD. TYP.
1.350
1.222 ±.002
.585
27°
30°
16°
5°
20°
.1255 .1265 DIA.
SHARP CORNER .003 R MAX.
.815 .859 BLANK DIM.
.870 .866 AFTER GRIND
1.537
.384 .379
.539 .534
1/11/79 Quenching as shown — can grind 0.6° if desired
HD-2020
SEAR SAFETY CAM
SEAR SAFETY CAM BLANK
PART USE
C-15666

xc: R.L. Hall
H.K. Boyle
J.P. Linde
G.D. Campbell
R.W. Farrington, Jr
Est. #4293

May 27, 1981

C.B. Workman

Proposed Revisions to Model 700 ADL Product Specifications

A "high-spot" analysis of current M/700 ADL costs and the effects of proposed revisions to the product specifications has been completed based on a list of proposed features provided by Marketing and Research. All costs are stated in current dollars and are based on current labor, material, and burden rates.

Three sets of specifications and a total of 25 revised features were proposed. Detailed processes and project expenditure estimates were not provided. The net cost effect of each feature was estimated relative to current M/700 ADL specifications and volume. The estimated factory cost for each proposed set of specifications are summarized in the following table:

Feature	Net Cost Effect: Full Allocation	Net Cost Effect: Incremental	Proposals: Marketing	Proposals: Ilion I	Proposals: Ilion II
Present M/700 ADL	--	--	$ 138.62	$ 138.62	$ 138.62
1. Cut Checkering -	$ 6.21	$ 3.62	Yes	Yes	Yes
2. Open Sights	--	--	No	No	No
3. Delete Open Sights	(5.29)	(3.63)	Yes	Yes	Yes
4. Scope Rings	15.63	12.63	Yes	No	No
5. Cast Follower	--	--	Yes	No	No
6. Formed Follower	(3.20)	(2.51)	No	Yes	Yes
7. Soft Rubber Butt Pad	Not Evaluated[1]		No	No	No
8. Simplified Butt Plate	(.25)	(.17)	Yes	Yes	Yes
9. Delete Jeweled Bolt	(.38)	(.28)	No	Yes	Yes
2 10. Plain Bolt Handle	Not Evaluated[2]		No	Yes	Yes
11. Present Bolt Handle	--	--	Yes	No	No
12. BDL Floor Plate	3.90	2.95	Yes	No	Yes
13. RKW-Finish	--	--	Yes	No	No
14. Lacquer Finish - Gloss	(5.29)	(4.26)	No	Yes	Yes
15. Monte Carlo	--	--	Yes	No	No
16. Cheekpiece	--	--	Yes	No	No
3 17. Grip Cap - 700 BDL	.28	.19	Yes	No	No
18. "Classic" Style Stock	(.96)	(.70)	No	Yes	Yes
19. Swivel Studs	1.02	.76	Yes	No	Yes
20. Sling	Not Evaluated[1]		No	No	No
21. Walnut Stock	--	--	Yes	Yes	Yes
22. Alternate Wood	Not Evaluated[1]		No	No	No
23. High Gloss Finish	--	--	Yes	Yes[3]	No
24. Satin Finish	--	--	No	Yes	Yes
25. Delete Bolt Lock	(.04)	(.03)	No	No	No
Estimated Full Allocation Factory Cost			$ 160.09	$ 129.42	$ 134.34

Proposed Revisions to Model 700 ADL Product Specifications - (cont'd.)

Footnotes to Table

1. Although listed, these features were not estimated because they were deleted in the Marketing and Ilion proposed specifications.

2. A plain bolt handle was not evaluated because neither detailed process estimates nor purchased cost data were currently available.

3. Proposal Ilion I called for high gloss lacquer finish. This feature was estimated based on process costs for the low-lustre M/788 lacquer finish.

As a further basis for comparison, the following table shows estimated pretax earnings and percentage margin at current M/700 ADL pricing for each proposal, plus calculated net and retail selling prices to yield stated percentage margin levels.

	Present M/700 ADL	Marketing	Ilion I	Ilion II
Current Retail Selling Price	$ 334.95	$ 334.95	$ 334.95	$ 334.95
Current Net Selling Price	$ 177.44	$ 177.44	$ 177.44	$ 177.44
Pretax Earnings	$ 18.59	($ 1.54)	$ 27.40	$ 22.79
% of Net Selling Price	10.5%	(0.9%)	15.4%	12.5%
Calculated Prices for 10% Margin				
Retail Selling Price	$ 332.58	$ 384.10	$ 310.51	$ 322.21
Net Selling Price	$ 176.19	$ 203.47	$ 164.49	$ 170.75
for 15% Margin				
Retail Selling Price	$ 356.40	$ 411.60	$ 332.74	$ 345.39
Net Selling Price	$ 188.80	$ 218.04	$ 176.27	$ 182.97
for 20% Margin				
Retail Selling Price	$ 383.61	$ 443.02	$ 358.15	$ 371.76
Net Selling Price	$ 203.22	$ 234.69	$ 189.73	$ 196.94
for 25% Margin				
Retail Selling Price	$ 415.51	$ 479.89	$ 387.95	$ 402.70
Net Selling Price	$ 220.13	$ 254.22	$ 205.52	$ 213.33

J. C. Hutton

J.C. Hutton, Superintendent
Industrial Engineering Section

By: T.R. Andrews

TRA/kc

700 [illegible] ADL [illegible]

	+ Full abs.	Inc.	− Full abs.	Inc.
1. Floor plate	3.90	2.85		
2. Sights –	–	–	5.29	3.63
3. Cast follower				
4. Formed follower –				
5. no bolt locks	–	–	.04	.03
6. Cut checkering	6.21	3.62		
7. Loggen finish			5.29	4.26
8. Sling swivel studs	1.02	.76		
9. M Form Butt Plate	–	–		
10. BDL Grip Cap.	.28	.19		
11. ~~Imp~~ cased walnut finish	10.41	7.52	10.52	7.92
12.				

Marketing Full abs.

160.09
10.41
170.50
10.52
159.98 cost after July 14 & Sept 4 [illegible]

[illegible]

[illegible]

xc: R.L. Hall
H.K. Boyle
J.P. Linde
G.D. Campbell
R.W. Farrington, Jr.
Est. #4293

May 27, 1981

C.B. Workman

Proposed Revisions to Model 700 ADL Product Specifications

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Three sets of specifications and a total of 25 revised features were proposed. Detailed processes and project expenditure estimates were not provided. The net cost effect of each feature was estimated relative to current M/700 ADL specifications and volume. The estimated factory cost for each proposed set of specifications are summarized in the following table:

	Net Cost Effect		Proposals		
	Full	Incre-		Process	
Feature	Allocation	mental	Marketing	Ilion I	Ilion II
Present M/700 ADL	--	--	$ 138.62	$ 138.62	$ 138.62
1. Cut Checkering -	$ 6.21	$ 3.62	Yes	Yes	Yes
2. Open Sights	--	--	No	No	No
3. Delete Open Sights	(5.29)	(3.63)	Yes	Yes	Yes
4. Scope Rings	15.63	12.63	Yes	No	No
5. Cast Follower	--	--	Yes	No	No
6. Formed Follower	(3.20)	(2.51)	No	Yes	Yes
7. Soft Rubber Butt Pad	Not Evaluated[1]		No	No	No
8. Simplified Butt Plate	(.25)	(.17)	Yes	Yes	Yes
9. Delete Jeweled Bolt	(.38)	(.28)	No	Yes	Yes
2 10. Plain Bolt Handle	Not Evaluated[2]		No	Yes	Yes
11. Present Bolt Handle	--	--	Yes	No	No
12. BDL Floor Plate	3.90	2.95	Yes	No	Yes
13. RKW-Finish	--	--	Yes	No	No
14. Lacquer Finish - Gloss	(5.29)	(4.26)	No	Yes	Yes
15. Monte Carlo	--	--	Yes	No	No
16. Cheekpiece	--	--	Yes	No	No
3 17. Grip Cap — 700 BDL	.28	.19	Yes	No	No
18. "Classic" Style Stock	(.96)	(.70)	No	Yes	Yes
19. Swivel Studs	1.02	.76	Yes	No	Yes
20. Sling	Not Evaluated[1]		No	No	No
21. Walnut Stock	--	--	Yes	Yes	Yes
22. Alternate Wood	Not Evaluated[1]		No	No	No
23. High Gloss Finish	--	--	Yes	Yes[3]	No
24. Satin Finish	--	--	No	Yes	Yes
25. Delete Bolt Lock	(.04)	(.03)	No	No	No
Estimated Full Allocation Factory Cost			$ 160.09	$ 129.42	$ 134.34

Proposed Revisions to Model 700 ADL Product Specifications - (cont'd.)

Footnotes to Table

1. Although listed, these features were not estimated because they were deleted in the Marketing and Ilion proposed specifications.

2. A plain bolt handle was not evaluated because neither detailed process estimates nor purchased cost data were currently available.

3. Proposal Ilion I called for high gloss lacquer finish. This feature was estimated based on process costs for the low-lustre M/788 lacquer finish.

As a further basis for comparison, the following table shows estimated pretax earnings and percentage margin at current M/700 ADL pricing for each proposal, plus calculated net and retail selling prices to yield stated percentage margin levels.

	Present M/700 ADL	Marketing	Ilion I	Ilion II
Current Retail Selling Price	$ 334.95	$ 334.95	$ 334.95	$ 334.95
Current Net Selling Price	$ 177.44	$ 177.44	$ 177.44	$ 177.44
Pretax Earnings	$ 18.59	($ 1.54)	$ 27.40	$ 22.79
% of Net Selling Price	10.5%	(0.9%)	15.4%	12.5%
Calculated Prices				
for 10% Margin				
Retail Selling Price	$ 332.58	$ 384.10	$ 310.51	$ 322.21
Net Selling Price	$ 176.19	$ 203.47	$ 164.49	$ 170.75
for 15% Margin				
Retail Selling Price	$ 356.40	$ 411.60	$ 332.74	$ 345.39
Net Selling Price	$ 188.80	$ 218.04	$ 176.27	$ 182.97
for 20% Margin				
Retail Selling Price	$ 383.61	$ 443.02	$ 358.15	$ 371.76
Net Selling Price	$ 203.22	$ 234.69	$ 189.73	$ 196.94
for 25% Margin				
Retail Selling Price	$ 415.51	$ 479.89	$ 387.95	$ 402.70
Net Selling Price	$ 220.13	$ 254.22	$ 205.52	$ 213.33

J. C. Hutton

J.C. Hutton, Superintendent
Industrial Engineering Section

By: T.R. Andrews

TRA/kc

M/7 DESIGN SPECIFICATION

This is a composite listing of features provided on the M/7 proto-type and those desired by Research:

- Octagonal Receiver
  - Investigate the use of octagonal stock
  - Heavier barrel lug
- Walnut Stock
  - True Classic
  - No Monte Carlo
  - Cheekpiece
  - Cut - functional checkering
  - Sling swivel studs
- Hammer Forged Barrel
  - No turn or polish
  - Program to determine possible benefits i.e., accuracy vs. finish
  - Lightweight - slimmer contour
  - Clean no sights
- Fire Control
  - Blocked trigger and sear
  - Bolt lock
  - New safety configuration or location
  - With safe adjustments
- Improved (Reduced) Locktime
  - Lightweight firing pin
  - Investigate pierced primer gas flow around firing pin and head
- Additional Desired Features
  - Scope mounts
  - New bolt handle
  - Jeweled
    - follower
    - bolt body
- New Extractor
- New Feeding System
  - To be smoother
  - To be functionally superior
  - To be detachable with integral magazine box

- Classic Calibers
- Limited Production 3,000 - 4,000 per year

F. E. Martin:ws
September 11, 1981

c: J. G. Williams
J. E. Preiser
P. H. Holmberg
J. P. Linde
G. D. Campbell
J. W. Brooks

RD-69 REV. 6-58

REMINGTON ARMS COMPANY, INC.

INTER-DEPARTMENTAL CORRESPONDENCE

Remington

Bridgeport, Connecticut
July 14, 1981

C. B. WORKMAN

MODEL REQUIREMENTS - M/700 ADL RESTYLE

Following is a list of model requirements for the M/700 ADL re-style.

ACTION:

- Standard M/700 with detachable floor plate
- No iron sights
- Redesigned cast magazine follower
- No bolt lock
- Jeweled bolt

STOCK:

- M/700 ADL style
- Cut-checkering (reduced pattern from BDL or Classic)
- New lacquer finish (medium gloss)
- Sling swivel studs
- M/Four butt plate
- BDL grip cap

ACCESSORIES:

- Scope mount rings - design to be determined

Bill.

W. H. FORSON

WHF:b

REMINGTON ARMS CO.
RECEIVED
JUL 1 ? 1981
ILION RESEARCH DIVISION

RD-49-B

REMINGTON ARMS COMPANY, INC.

INTER-DEPARTMENTAL CORRESPONDENCE

Remington DUPONT   PETERS DUPONT

"CONFINE YOUR LETTER TO ONE SUBJECT ONLY"

Ilion, New York
November 28, 1978

TO: C.B. WORKMAN

FROM: J. A. STEKL

SUBJECT: CENTER FIRE RIFLE CALIBERS INTRODUCED BY REMINGTON

The following table summarizes center fire rifle calibers introduced by Remington Arms Company, Inc. from 1963 to date:

CALIBER	YEAR INTRODUCED	INTRODUCED IN MODEL 700
6mm Rem.	1963	X
223 Rem.	1964	
22/250 Rem.	1965	X
350 Rem. Mag.	1965	
6.5mm Rem. Mag.	1966	
25-06 Rem.	1970	X
17 Rem.	1971	X
8mm Rem. Mag.	1977	X

JAS:sse

RIFLE BOLT MALFUNCTIONS

- Springs are right hand.
- When bolt is opened, spring is depressed and expands by coils turning.
- If spring ends cannot move, assembly will have no torque moment but spring tries to unwind. Probably tend to buckle.
- If both ends of spring cannot move, it will not turn assembly to uncock.
- If front end can turn only or slide, and the rear of spring cannot turn the spring will not have torque moment as spring will unwind.
- If rear end can turn only or slide, and the front end cannot turn, the spring will not have torque moment as spring will unwind.
- If firing pin cannot turn and front of spring cannot turn, there will be no torque as spring will unwind.
- Same with rear of spring held and firing pin held, spring will unwind.
- If bolt opened slow or fast - front of spring held to firing pin - O.D. of spring held to I.D. of bolt then firing pin would tend to rotate and cause uncocking.
- Dirt, grease, etc., in detent notch and frozen could allow firing pin head and bolt plug to rotate up, sliding off crud.
- Worn detent notch could cause problem along with frozen dirt or crud in detent notch.

JWBrooks:eb
8-27-82

RD-49-B

REMINGTON ARMS COMPANY, INC.

INTER-DEPARTMENTAL CORRESPONDENCE

Remington DUPONT   PETERS DUPONT

"CONFINE YOUR LETTER TO ONE SUBJECT ONLY"

xc: C.B. Workman
C.E. Ritchie
J.W. Brooks
D.E. Bullis

Ilion, New York
December 28, 1981

TO: J.H. Hennings

FROM: A.J. Long/F.L. Supry FLS

M/700 NEW DESIGN SAFETY, NO BOLT LOCK ARM

Date Started: 9/4/81
Date Completed: 10/6/81
Work Order No.: C-1803

INTRODUCTION

Six M/700 new design safety switches were received from design for evaluation. The evaluation will include dry cycle function, drop test function and live fire function.

TEST OBJECTIVE

To determine if the new safety will function satisfactorily without the bolt lock arm.

TEST OBSERVATION

Five samples were dry cycled 10,000 cycles each, four of the five samples experienced no malfunctions. At 4,000 cycles, sample no. 4 was found to be difficult to operate. It was then disassembled, cleaned, lubricated and reassembled. There were no malfunctions during the remainder of the test.

There were no malfunctions during the live fire tests on the same five samples.

There were no failures during the drop testing, which was conducted on two of the five samples and on the sample that had no dry cycles or live fire rounds. One standard production M/700 was included as a control rifle.

A photograph comparing the current design to the new design is included in this report.

DRY CYCLE

Five of the six samples were assembled into Model 700 actions, after the sear lift and engagement was determined by assembly. Ten Thousand (10,000) cycles were conducted on each sample on a safe on - off dry cycle machine.

The trigger pull and safe on–off forces were measured at the start of the dry cycle and at 1,000 round intervals during the test. The sear engagement and sear lift was also measured at the completion of the dry cycle testing.

TEST RESULTS (for individual test results refer to Data Sheet No. 1)

After 10,000 Dry Cycles:

- Sear engagement showed no change.
- Sear lift showed an overall increase of .0017".
- Trigger pull showed an overall increase of .025 lbs.
- Safe "on" forces showed an overall decrease of 2.0 lbs.
- Safe "off" forces showed an overall decrease of 2.25 lbs.
- There were no failures or breakages.

LIVE FIRE

The five samples with 10,000 dry cycles were assembled in M/700 30.06 caliber actions; and 500 rounds of R30065 (180 gr. pointed soft point core-lokt) were fired thru each action.

TEST RESULTS

There were no breakages or failures.

DROP TEST

Three of the M/700 design change fire controls (2 with 10,000 dry cycles and 500 live rounds, one as received from design) and one current production M/700 fire control were assembled in M/700 30,06 cal. actions; and a drop test was conducted.

Each of the rifles were dropped from 4 feet onto a solid neoprene rubber mat, and from 2 feet onto a solid maple plank.

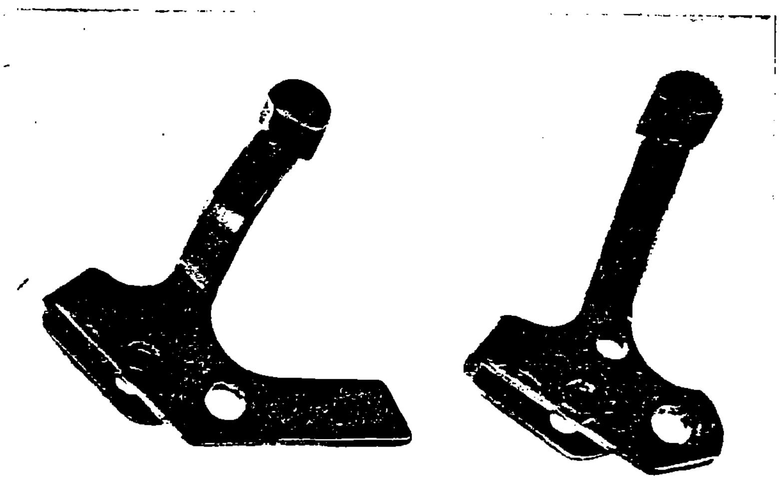
- At each distance the rifles were dropped in four different positions:
  a) muzzle first
  b) butt first
  c) top first
  d) bottom first
- The actions were closed on a copper crusher placed in a holder in the chamber.
- The safety was in the "on" position in the 4 foot drops, and in the "off" position in the two foot drops.

TEST RESULTS

- The position of the safety was not affected by the drops.
- The rifle did not fire during the test.
- The copper crusher was not indented during the test.
- There was no difference noticed in the results of this test between the new design and the current design fire controls.

Firearms Research Division
AL/FS:m
Attachments

MODEL 700 SAFETY NEW DESIGN TEST



CURRENT NEW DESIGN

10/15/81

MODEL 700 NEW DESIGN SAFETY
NO BOLT LOCK ARM

DATA SHEET #1

10-19-81

A.J.L.

	SEAR ENGAGEMENT	SEAR LIFT FULL	SEAR LIFT NULL		DRY CYCLES 0	1000	2000	3000	4000	5000	6000	7000	8000	9000	10000	AFTER 500 RDS LIVE FIRE
1 →	.010	.011	.0057	TRIG. PULL	6.1	6.3	6.3	6.25	6.1	6.4	5.9	6.4	6.25	6.25	6.25	6.0
				SAFE ON	9.1	7.3	7.5	7.6	6.6	6.4	6.1	6.1	6.1	6.5	6.1	4.3
				OFF	9.0	8.1	8.1	8.3	7.5	7.1	5.3	4.8	4.6	5.1	4.5	3.2
2 →	.010	.0095	.0035	TRIG. PULL	5.75	6.0	6.25	6.5	6.5	6.4	6.4	6.1	6.3	6.9	6.9	7.5
				SAFE ON	8.1	6.1	5.1	6.1	6.1	5.1	5.1	5.3	5.1	4.5	4.5	4.5
				OFF	7.1	8.1	6.8	5.1	5.1	6.3	4.5	5.3	5.1	4.1	4.1	3.5
3 →	.010	.011	.006	TRIG. PULL	6.3	6.5	6.5	6.6	6.75	6.5	7.0	6.8	6.6	6.4	6.6	7.0
				SAFE ON	7.0	7.5	7.5	7.3	6.0	5.0	5.1	4.5	4.5	4.5	5.0	4.5
				OFF	7.5	7.5	7.5	7.5	5.6	5.3	5.6	4.5	5.5	5.5	5.3	4.0
4 →	.010	.0105	.0045	TRIG. PULL	5.5	5.75	6.0	5.9	5.6	5.9	6.4	6.8	6.5	6.5	6.3	6.0
				SAFE ON	8.3	8.0	7.5	7.5	5.1	5.1	5.5	6.0	6.5	6.5	6.5	4.7
				OFF	8.8	7.6	7.8	7.0	6.5	6.8	6.5	6.8	6.8	7.1	7.5	4.5
5 →	.010	.0105	.0045	TRIG. PULL	6.4	6.75	6.5	6.4	6.3	6.4	6.6	6.5	6.5	6.75	6.5	7.5
				SAFE ON	8.6	8.6	8.0	7.6	7.1	6.9	6.0	6.6	5.6	6.5	6.0	6.0
				OFF	6.6	6.5	6.6	7.5	6.1	6.3	6.6	6.9	7.1	7.5	6.1	5.5

AFTER 10,000 CYCLES AND DROP TEST

	SEAR ENGAGEMENT	SEAR LIFT FULL	SEAR LIFT NULL
1 →	.010	.010	.0065
2 →	.010	.010	.005
3 →	.010	.010	.0065
4 →	.010	.0105	.006
5 →	.010	.010	.0075

RO-40-8

REMINGTON ARMS COMPANY, INC.

INTER-DEPARTMENTAL CORRESPONDENCE

Remington DUPONT / PETERS DUPONT

Distribution: C.B. Workman
C.E. Ritchie
J.W. Brooks
D.E. Bullis

"CONFINE YOUR LETTER TO ONE SUBJECT ONLY"

RESEARCH TEST and MEASUREMENT REPORT – Report No. 812391

M700 NEW DESIGN SAFETY, NO BOLT LOCK ARM

Prepared by: A. Long / F. Supry

Date Prepared: 12-28-81

Proofread and Cleared By:

J.H. Hennings, Foreman-Test Lab / R.E. Nightingale, Foreman-Measurement Lab

James Hennings — Signature — 1-20-82 — Date

C.E. Ritchie,
Sr. Supervisor - Testing,
Meas. & Mech. Analysis Lab

C. Evan Ritchie — Signature — 1/20/82 — Date

RD-40-8

REMINGTON ARMS COMPANY, INC.

INTER-DEPARTMENTAL CORRESPONDENCE

Remington DU PONT   PETERS DU PONT

"CONFINE YOUR LETTER TO ONE SUBJECT ONLY" ____________

xc: C.B. Workman
C.E. Ritchie
J.W. Brooks
D.E. Bullis

Ilion, New York
December 28, 1981

TO: J.H. Hennings

FROM: A.J. Long/F.L. Supry FLS

M/700 NEW DESIGN SAFETY, NO BOLT LOCK ARM

Date Started:	9/4/81
Date Completed:	10/6/81
Work Order No.:	C-1803

INTRODUCTION

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A photograph comparing the current design to the new design is included in this report.

DRY CYCLE

Five of the six samples were assembled into Model 700 actions, after the sear lift and engagement were determined to be satisfactory by assembly. Ten thousand (10,000) cycles were conducted on each sample on a safe on-off dry cycle machine.

The trigger pull and safe on-off forces were measured at the start of the dry cycle and at 1,000 round intervals during the test. The sear engagement and sear lift were also measured at the completion of the dry cycle testing.

TEST RESULTS (For individual test results refer to Data Sheet No. 1).

After 10,000 Dry Cycles:

- Sear engagement showed no change.
- Sear lift showed an average decrease of .0004" FULL, and an average INCREASE of .001" NULL.
- Trigger pull showed an overall increase of 0.25 lbs.
- Safe "on" forces showed an overall decrease of 2.0 lbs.
- Safe "off" forces showed an overall decrease of 2.25 lbs.
- There were no failures or breakages.

LIVE FIRE

The five samples with 10,000 dry cycles were assembled in M/700 30.06 caliber actions; and 500 rounds of R30065 (180 gr. pointed soft point core-lokt) were fired thru each action.

TEST RESULTS

There were no breakage or failures.

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Three of the M/700 design change fire controls (2 with 10,000 dry cycles and 500 live rounds, one as received from design) and one current production M/700 fire control were assembled in M/700 30,06 cal. actions; and a drop test was conducted.

Each of the rifles were dropped from 4 feet onto a solid neoprene rubber mat, and from 2 feet onto a solid maple plank.

- At each distance the rifles were dropped in four different positions:
  a) muzzle first
  b) butt first
  c) top first
  d) bottom first

- The actions were closed on a copper crusher placed in a holder in the chamber.

- The safety was in the "on" position in the 4 foot drops, and in the "off" position in the two foot drops.

TEST RESULTS

- The position of the safety was not affected by the drops.

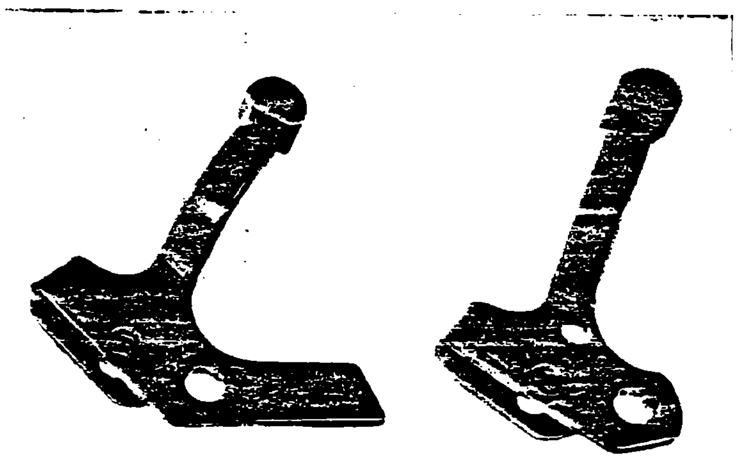
- The rifle did not fire during the test.

- The copper crusher was not indented during the test.

- There was no difference noticed in the results of this test between the new design and the current design fire controls.

Firearms Research Division
AL/FS:m
Attachments

MODEL 700 SAFETY NEW DESIGN TEST



CURRENT NEW DESIGN

10/15/81

MODEL 700 NEW DESIGN SAFETY
NO BOLT LOCK ARM

DATA SHEET #1
10-9-81
A.J.L.

	SEAR ENGAGEMENT ↓	SEAR FULL ↓	LIFT NULL ↓	DRY CYCLES →	0	1000	2000	3000	4000	5000	6000	7000	8000	9000	10000	AFTER 500 RDS LIVE AMMO
1 →	.010	.011	.0057	TRIG PULL	6.1	6.3	6.3	6.25	6.1	6.4	5.9	6.1	6.25	6.25	6.25	6.0
				SAFE ON	9.1	7.3	7.5	7.6	6.6	6.4	6.1	6.1	6.1	6.5	6.1	4.3
				OFF	9.0	8.1	8	8.3	7.5	7.1	5.3	4.8	4.6	5.1	7.5	3.2
2 →	.010	.0095	.0035	TRIG PULL	5.75	6.0	6.25	6.5	6.6	6.1	6.1	6.1	6.8	6.9	6.9	7.5
				SAFE ON	8.1	6.1	5.1	6.1	6.1	5.1	5.1	5.3	5.1	4.5	7.5	4.5
				OFF	7.1	8	6.3	5.1	5.1	5.3	4.5	5.3	5.1	4.1	7.1	3.5
3 →	.010	.011	.006	TRIG PULL	6.3	6.5	6.5	6.6	6.15	6.5	7.0	6.8	6.6	6.1	6.6	7.0
				SAFE ON	7.0	7.5	7.5	7.5	6.0	5.0	5.1	4.5	4.5	4.5	5.0	4.5
				OFF	7.5	7.5	7.5	7.5	5.6	5.3	5.8	4.5	5.8	5.5	5.3	4.0
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5 →	.010	.0105	.0015	TRIG PULL	6.4	6.75	6.5	6.1	6.3	6.4	6.6	6.5	6.5	6.75	6.5	7.5
				SAFE ON	8.6	8.6	8.0	7.6	7.1	6.9	6.0	6.6	5.6	6.5	6.0	6.0
				OFF	6.8	4.5	6.4	7.5	6.1	6.3	6.6	6.9	7.1	7.5	6.1	5.5
AFTER 10,000 CYCLES AND DROP TEST																
1 →	.010	.010	.0065													
2 →	.010	.010	.005													
3 →	.010	.010	.0065													
4 →	.010	.0105	.006													
5 →	.010	.010	.0075													

RO-49-6

REMINGTON ARMS COMPANY, INC.

INTER-DEPARTMENTAL CORRESPONDENCE

Remington DUPONT / PETERS DUPONT

"CONFINE YOUR LETTER TO ONE SUBJECT ONLY"

Distribution: C.B. Workman
C.E. Ritchie
J.W. Brooks
D.E. Bullis

RESEARCH TEST and MEASUREMENT REPORT – Report No. 812391

M700 NEW DESIGN SAFETY, NO BOLT LOCK ARM

Prepared by: A. Long / F. Supry

Date Prepared: 12-28-81

Proofread and Cleared By:

J.H. Hennings, Foreman-Test Lab / R.E. Nightingale, Foreman-Measurement Lab

Signature Date

C.E. Ritchie,
Sr. Supervisor - Testing,
Meas. & Mech. Analysis Lab

Signature Date

RD-49-B

REMINGTON ARMS COMPANY, INC.

INTER-DEPARTMENTAL CORRESPONDENCE

Remington DU PONT   PETERS DU PONT

xc: C.B. Workman
C.E. Ritchie
J.W. Brooks
D.E. Bullis

"CONFINE YOUR LETTER TO ONE SUBJECT ONLY"

Ilion, New York
December 28, 1981

Trigger Pull set at? 3-5 lbs.
speed?
Sear Engagement known? [illegible]?
.015 [illegible]
.005 between sear & connector

TO: J.H. Hennings

FROM: A.J. Long/F.L. Supry FLS

M/700 NEW DESIGN SAFETY, NO BOLT LOCK ARM

Date Started: 9/4/81
Date Completed: 10/6/81
Work Order No.: C-1803

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TEST RESULTS (for individual test results refer to Data Sheet No. 1)

After 10,000 Dry Cycles:

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- Sear lift showed an overall increase of .0017".
- Trigger pull showed an overall increase of .025 lbs.
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  d) bottom first

- The actions were closed on a copper crusher placed in a holder in the chamber.

- The safety was in the "on" position in the 4 foot drops, and in the "off" position in the two foot drops.

TEST RESULTS

- The position of the safety was not affected by the drops.

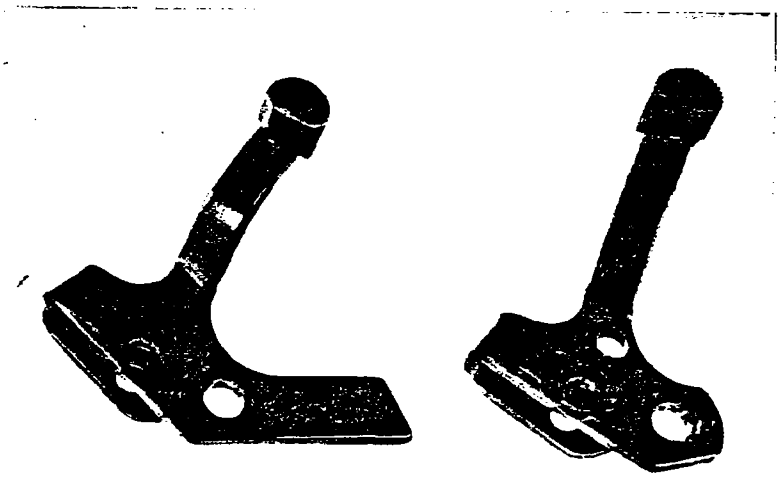
- The rifle did not fire during the test.

- The copper crusher was not indented during the test.

- There was no difference noticed in the results of this test between the new design and the current design fire controls.

Firearms Research Division
AL/FS:m
Attachments

MODEL 700 SAFETY NEW DESIGN TEST



CURRENT NEW DESIGN

10/15/81

.015 DLS. .005 Trig Pull 3-5"

MODEL 700 NEW DESIGN SAFETY
NO BOLT LOCK ARM

DATA SHEET #1
10-19-81
A.J.L.

DRY CYCLES

	SEAR ENGAGEMENT	SEAR LIFT FULL	SEAR LIFT NULL		0	1000	2000	3000	4000	5000	6000	7000	8000	9000	10000	AFTER 500 RDS LIVE FIRE
1 →	.010	.011	.0057	TRIG. PULL	6.1	6.3	6.3	6.25	6.1	6.4	5.9	6.4	6.25	6.25	6.25	6.0
				SAFE ON	9.1	7.3	7.5	7.6	6.6	6.4	6.1	6.1	6.1	6.5	6.1	4.3
				OFF	9.0	8.1	8.1	8.3	7.5	7.1	5.3	4.8	4.6	5.1	4.5	3.2
2 →	.010	.0095	.0035	TRIG. PULL	5.75	6.0	6.25	6.5	6.5	6.4	6.4	6.1	6.3	6.9	6.9	7.5
				SAFE ON	8.1	6.1	5.1	6.1	6.1	5.1	5.1	5.3	5.1	4.5	4.5	4.5
				OFF	7.1	8.1	6.3	5.1	5.1	6.3	4.5	5.3	5.1	4.1	4.1	3.5
3 →	.010	.011	.006	TRIG. PULL	6.3	6.5	6.5	6.6	6.75	6.5	7.0	6.8	6.6	6.4	6.6	7.0
				SAFE ON	7.0	7.5	7.5	7.3	6.0	5.0	5.1	4.5	4.5	4.5	5.0	4.5
				OFF	7.5	7.5	7.5	7.5	5.6	5.3	5.6	4.5	5.5	5.5	5.3	4.0
4 →	.010	.0105	.0045	TRIG. PULL	5.5	5.75	6.0	5.9	5.6	5.9	6.4	6.8	6.5	6.5	6.3	6.0
				SAFE ON	8.3	8.0	7.5	7.5	5.1	5.1	5.5	6.0	6.5	6.5	6.5	4.7
				OFF	8.8	7.6	7.3	7.0	6.5	6.8	6.5	6.8	6.8	7.1	7.5	4.5
5 →	.010	.0105	.0045	TRIG. PULL	6.4	6.75	6.5	6.4	6.3	6.4	6.6	6.5	6.5	6.75	6.5	7.5
				SAFE ON	8.6	8.6	8.0	7.6	7.1	6.9	6.0	6.6	5.6	6.5	6.0	6.0
				OFF	6.6	6.5	6.6	7.5	6.1	6.3	6.6	6.9	7.1	7.5	6.1	5.5

AFTER 10,000 CYCLES AND DROP TEST

	SEAR ENGAGEMENT	SEAR LIFT FULL	SEAR LIFT NULL
1 →	.010	.010	.0065
2 →	.010	.010	.005
3 →	.010	.010	.0065
4 →	.010	.0105	.006
5 →	.010	.010	.0075

RD-69 REV. 6-58

REMINGTON ARMS COMPANY, INC.

INTER-DEPARTMENTAL CORRESPONDENCE

Remington

cc: E. Hooton, Jr.
J. G. Williams
J. P. Glas
C. A. Riley
P. H. Holmberg
W. H. Forson
C. B. Workman
K. D. Green
J. H. Chisnall
J. A. Stekl
R. L. St. John
J. H. Carter
J. P. Linde
R. B. Sperling

Bridgeport, Connecticut
February 3, 1982

REMINGTON ARMS CO.
RECEIVED
FEB 5 1982
FIREARMS RESEARCH DIVISION

H. K. BOYLE

SERVICE REQUIREMENT FOR MODEL 700
RELATIVE TO REMOVAL OF BOLT LOCK

With removal of the bolt lock feature from the Model 700, several questions have arisen with regard to repairs. This note sets forth Marketing's desires for handling repairs and/or replacements of Model 700's.

The various Arms Service repairs should be handled following these guidelines:

- Receiver and trigger assembly not involved in repair.

  No change is to be made to the bolt lock. From a bolt lock standpoint, the gun is to be returned in the same condition it was received.

- Receiver or trigger assembly involved in repair but bolt lock is not affected.

  If the repairs can be made without impacting the bolt lock, they should be done that way.

- Receiver or trigger assembly must be replaced as part of the repair.

  The same guidelines as above should be followed. The features of the firearm should not be changed during a repair. If parts are not available to make such repairs, then the customer should be given the choice of either having the repair made (and accepting the feature change) or having the gun returned without being repaired.

Replacement of Model 40X, Model 600, and 660 parts should be handled the same way. If the bolt lock feature will change as a result of a repair, we must have the customer's permission in advance.

Repairs made by our Recommended Gunsmiths should follow this same philosphy. This situation would arise only when the trigger assembly is replaced, since the receiver is a restricted part.

FTMillener
F. T. Millener

FTM:fms

MODEL	TRIGGER PULL	FIRING PIN INDENT
Mohawk 10C	3.5 - 6.5 lbs.	.014"- .016"
40XB Sporter	3.0 - 5.0 lbs.	.019"
40XR Sporter	2.0 - 4.0 lbs.	.019"
Nylon 66	3.5 - 6.5 lbs.	.014" -.016"
540XR & Junior	1.0 - 5.0 lbs.	----------------
541-S Custom Spt.	3.0 - 5.0 lbs.	.017" -.025"
552	3.5 - 6.5 lbs.	.014" -.016"
572	3.5 - 6.5 lbs.	.016" -.018"
580-581-582	3.5 - 6.5 lbs.	.017" -.025"
40X C.F.	1.5 - 3.5 lbs.	.018" -.026"
40XC	2.0 - 4.0 lbs.	.018" -.026"
XP-100	1.5 - 2.750 lbs.	.018" -.026"
Mohawk 600	4.0 - 6.0 lbs.	.018" -.026"
700	3.0 - 5.0 lbs.	.018" -.026"
700 Custom	3.0 - 5.0 lbs.	.018" -.026"
700 Classic	3.0 - 5.0 lbs.	.018" -.026"
700 Sniper	3.0 - 3.5 lbs.	.018" -.026"
700 Varmint	2.0 - 4.0 lbs.	.018" -.026"
742,7400,Four 760,7600,Six	3.5 - 6.5 lbs.	.019" -.025"
788	3.5 - 6.5 lbs.	.018" -.018"
870-Field, Mag., Deer, & Police	3.5 - 6.5 lbs.	.013" -.018"
870 Trap Skeet	3.5 - 5.0 lbs.	.013" -.018"
1100 Field, Mag., and Deer	3.5 - 6.5 lbs.	.013" -.018"
1100 Trap-Skeet	3.5 - 5.5 lbs.	.013" -.018"
3200	3.0 - 5.5 lbs.	.013" -.018"

C.J.S.
June 14, 1982

M. 700 Modified Connector
830423
2-12-83 + 2-23-83

RD-49-8

REMINGTON ARMS COMPANY, INC.

INTER-DEPARTMENTAL CORRESPONDENCE

Remington DUPONT — PETERS DUPONT

Distribution: C. B. Workman
C. E. Ritchie
J. W. Brooks
J. P. Linde

"CONFINE YOUR LETTER TO ONE SUBJECT ONLY"

RESEARCH TEST and MEASUREMENT REPORT – Report No. 830423

M/700 MODIFIED TRIGGER CONNECTOR EVALUATION

Prepared by: C. E. Ritchie

Date Prepared: 2 - 12 - 83

Proofread and Cleared By:

J.H. Hennings, Foreman-Test Lab / R.E. Nightingale, Foreman-Measurement Lab

Signature Date

C.E. Ritchie,
Sr. Supervisor - Testing,
Meas. & Mech. Analysis Lab

C. Evan Ritchie 2/22/83
Signature Date

TEST & MEASUREMENT LAB REPORT

REPORT NUMBER: 830423

REPORT TITLE: M/700 MODIFIED TRIGGER CONNECTOR EVALUATION

MODEL(S): 700

GAUGE OR CALIBER: All (.308 Cal. Tested)

DATE: 2 - 11 - 83

WORK ORDER NO.: G0460 - 000 X

PART NAME: Trigger Connector

DESIGNER/ENGINEER: J. W. Brooks

TEST TYPE:

1. PHOTO LAB
2. STRENGTH TEST - NO. OF GUNS TESTED ______
3. FUNCTION TEST - NO. OF GUNS TESTED 4
4. ACCURACY TEST - NO. OF GUNS TESTED ______
5. MEASUREMENTS - TYPE: Trigger Pull, Safe On-Off Forces, ~~Sear Lift (Finish Test)~~
6. ENVIRONMENTAL TEST
7. AMMUNITION TESTING & EVALUATION - TYPE: ______
8. VISUAL EVALUATION - ______ OUT OF ______ GUN SAMPLE
9. ENDURANCE - NO. OF GUNS TESTED: 4

   Dry Cycle Rounds = 25,000
   NO. OF ROUNDS PER GUN: Live 100
   Dry Cycle Total = 100,000
   TOTAL ROUNDS FIRED IN TEST: 400

   AMMO TYPE: MAGS. ______; TARGET: X

   RIM FIRE ______ CENTER FIRE ______

February 12, 1983

TO: C. B. WORKMAN

FROM: C. E. RITCHIE

REPORT TITLE: M/700 MODIFIED TRIGGER CONNECTOR EVALUATION

ABSTRACT

Recently, Production received M/700 Trigger Connectors from the vendor which were slightly (0.001" to 0.003") out of specification. Process Engineering, through J. W. Brooks, Supervisor Current Products Design, requested the Test Lab to determine whether this dimensional difference would adversely affect the safe operation of the Trigger Assembly and ultimately the M/700 rifle itself.

SCOPE OF TEST

To evaluate the out of specification M/700 Trigger Connector by testing 4 specially prepared M/700 rifles, 2 rifles with a minimum stack-up of dimensional tolerances and 2 with a maximum stack-up of dimensional tolerances.

(Refer to sketches in Appendix "A" Page 3 and 4.)

TEST RESULTS

All four (4) test rifles went through the dry cycle, live fire and drop test with no trigger related malfunctions.

(Refer to Appendix "A"Page 1 and 2 for individual results.)

REPORT TEXT

1. All four (4) test rifles reached 25,000 dry cycles with no trigger related malfunctions.

2. All four (4) test rifles were Jack Fired 100 live rounds using Remington 180 grain P.S.P. Cal. .308 ammo. with no trigger related malfunctions.

3. All four (4) rifles were pendulum drop tested, against both a neoprene and a hardwood backstop, at the three foot level in the following modes:

   Muzzle First - with Safe "On" and with Safe "Off"
   Butt First - " " " " " " "
   Left Side - " " " " " " "
   Right Side - " " " " " " "

   There were no trigger related malfunctions (firing pin did not fall) in any of the test rifles during the drop test.

4. At finish of test the following measurements were taken: Trigger Pull, Safe "On-Off" and Sear Lift. Present Remington Specs. are:

Trigger Pull	–	3.0 to 5.0 lbs.
Safe "On - Off"	–	None Established
Sear Lift	–	.005" to .018"

   NOTE: It was noted that the two min. condition test rifles had a higher reading on Trigger Pull, Safe "On - Off" and Sear Lift tests than the two max. condition rifles.

   Refer to Appendix " A" for individual results.

TEST PROCEDURE

A. Measurements
Sear Lift was measured at the conclusion of dry cycle, live fire and drop tests.

B. Test Concictions

1. All four (4) test rifles were dry cycle tested on the 4 cock and fire dry cycle machines in the R & D Test Lab Dry Cycle Room.

   All rifles were lubricated liberally with DuPont Teflon Wet Lubricant, in and around the Bolt Cocking Cam surface, Sear Safety Cam (top), and the Trigger Housing inspection hole every 5,000 cycles starting at 0 cycles.

2. After dry cycle testing, all 4 rifles were live round fired 100 rounds each with Remington 180 grain P.S.P. ammunition . All rifles were shot 20 rounds each, then allowed to cool/able to touch with the hand until all 100 rounds had been shot.

3. A drop test was then conducted on all four rifles at the 3 foot test height, on both hardwood and neoprene backstops from the muzzle, butt and both sides.

4. Sear Lift was then measured using the optical comparator in the R & D Model Shop.

C. Ammunition
Remington 180 grain P.S.P. Code R308W3.

D. Rifles used in the test:

Remington M/700, 1983 Restyle, Cal. .308

Rifle No. 8	Serial No. B6440493	(Min. Condition)
Rifle No. 5	Serial No. B6438179	" "
Rifle No. 7	Serial No. B6438908	(Max Condition)
Rifle No.	Serial No. B6438658	" "

"APPENDIX "A"

Report No. 830423

M-700 Modified Trigger Connector

2-12-83

J. Baggetta

Data Sheet No 1

	Gun No.	B6440493	B6438179	B6438908	B6438658	
		Min. Condition	Min Condition	Max Condition	Max Condition	Test Results
Dry Cycles		25000	25000	25000	25000	OK
Rounds Fired Rem 180gr PSP		100	100	100	100	OK
Drop Test Neoprene Pad						
Muzzle First						
Safe ON		OK	OK	OK	OK	
Safe OFF		OK	OK	OK	OK	
Butt First						
Safe ON		OK	OK	OK	OK	
Safe OFF		OK	OK	OK	OK	
Right Side						
Safe ON		OK	OK	OK	OK	
Safe OFF		OK	OK	OK	OK	
Left Side						
Safe ON		OK	OK	OK	OK	
Safe OFF		OK	OK	OK	OK	
Drop Test Hardwood Pad						
Muzzle First						
Safe ON		OK	OK	OK	OK	
Safe OFF		OK	OK	OK	OK	
Butt First						
Safe ON		OK	OK	OK	OK	
Safe OFF		OK	OK	OK	OK	
Right Side						
Safe ON		OK	OK	OK	OK	
Safe OFF		OK	OK	OK		
Left Side						
Safe ON		OK	OK	OK	OK	
Safe OFF		OK	OK	OK	OK	
Sear Lift		.0205"	.0265"	.0070"	.0060"	

Remington Spec. Sear Lift .005 to .018

CONFIDENTIAL-SUBJECT TO PROTECTIVE ORDER
KINZER V. REMINGTON

R2538646

45-606 EYE-EASE
45-706 20/20 BUFF
NATIONAL Made in U.S.A.

REPORT #830423

M/700 MODIFIED TRIGGER CONNECTOR

2-12-83

R. HOWE

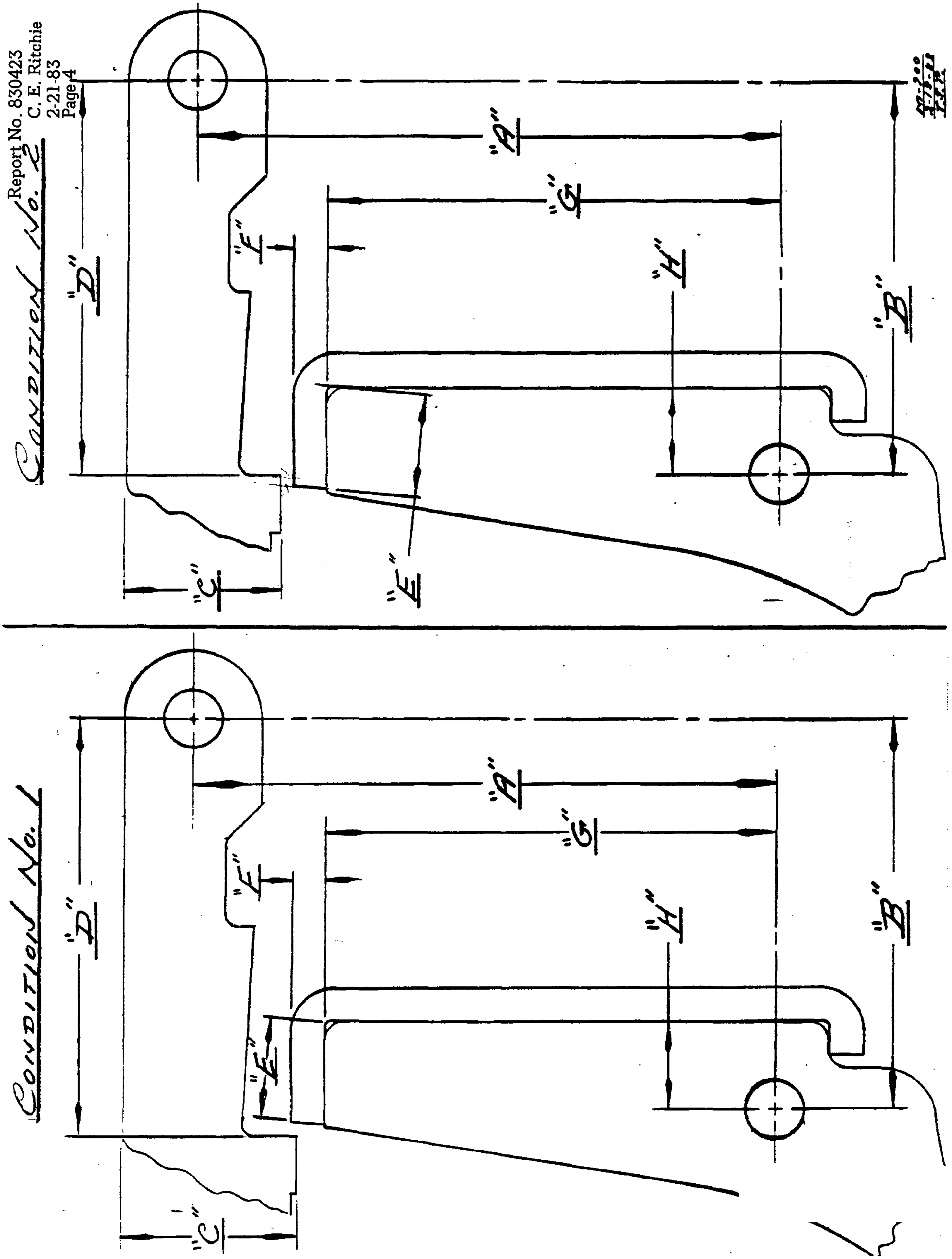
DATA SHEET NO. 2

	1	2	3	4	5	6
GUN NO.	B6440493 MIN CONDITION	B6438179 MIN CONDITION	B6438908 MAX CONDITION	B6438658 MAX CONDITION	REMINGTON SPEC.	
TRIGGER PULL POUND FORCES (RESULT OF THREE MEASUREMENTS)	5.9 LBS.	5.5 LBS.	4.9 LBS.	3.2 LBS.	3.0 TO 5.0 LBS.	
SAFE "ON" POUND FORCES (RESULT OF THREE MEASUREMENTS)	11.1 LBS.	16.5 LBS.	6.0 LBS.	6.2 LBS.	NONE ESTABLISHED	
SAFE "OFF" POUND FORCES (RESULT OF THREE MEASUREMENTS)	9.3 LBS.	8.8 LBS.	5.0 LBS.	8.0 LBS.	NONE ESTABLISHED	

CONDITION NO.		1	1	1	2	2	2	1	2	2	1	1	2
TRIGGER HOUSING ASSEMBLY NO.		1	2	3	4	5	6	7	8	9	10	11	12
	Dim.												
HOUSING	A	1.2395	1.2385	1.2395	1.241	1.2405	1.240	1.2385	1.2385	1.2405	1.240	1.238	1.2395
	B	.8395	.839	.8395	.841	.8415	.841	.840	.8405	.8405	.8385	.839	.842
SEAR	C	.1975-.198	.1975-.198	.1975-.198	.186	.1865	.1865	.1975	.1855	.1855	.1975	.1975-.198	.1865
	D	.8705-.871	.870-.8695	.8705-.871	.8655	.8655	.8645	.870-.8695	.863	.865	.871	.869-.8695	.8645
CONNECTOR	E	.215	.215	.215	.225	.225	.225	.215	.225	.225	.215	.215	.225
	F	.074	.072-.0715	.071-.0705	.071	.071	.071	.074	.071	.071	.074	.072-.0715	.071
TRIGGER	G	.972	.975	.975	.967	.967	.967	.9725	.967	.967	.9725	.975	.967
	H	.190	.190	.190	.186	.186	.186	.190	.186	.186	.190	.190	.186
						B6438179		B6438908	B6440493		B6438658		

JWB:js
2/18/83

Report No. 830423
C. E. Ritchie
2-21-83
Page 4



Report No. 830423

RESEARCH TEST & MEASUREMENT LAB WORK REQUEST

AREA OF TESTING

____ Developmental	____ Safety Related	____ Litigation
____ Design Acceptance	____ Competitive Evaluation	____ Warehouse Audit
____ Pre-Pilot	____ New Design	____ Cost Reduction
____ Pilot	____ Design Change	Stake ____
____ Production Acceptance	✓ Plant Assistance	____ Other

FIREARM STAT'S.	REPORT REQ'D.	
MODEL: 700	FORMAL ✓	DATE REQUESTED: 2-11-83
CAL or GAGE: ANY		DATE NEEDED BY: 2-14-83
BARREL TYPE: —	TEST RESULTS ONLY ____	REQUESTED BY: J. LINDE
PROOFED: YES ____ NO ____		WORK ORDER NO: G0460-000X

TEST TYPE

____ Strength Test	____ Ammunition Test	✓ Dry Cycle Test	____ Photo/Video
✓ Function Test	____ Environmental Test	____ Measurements	____ Other ____
____ Accuracy Test	____ Customer Complaint	✓ Endurance Test	____

XPLAIN IN DETAIL THE REASON FOR THIS TEST:

- Dry cycle rifles with sample Trigger assemblies 7, 10 and 4, 5 to 25,000 cycles
- Shoot 100 rounds in jack shooting + check for any Trigger related malfunctions
- Drop test from 3' on the muzzle, Butt, + sides. check for rifle firing.

UNS REQUIRED: 4

New trigger connector (min./max) conditions.

(Test Results to go to CB Workman immediately)

OTE: NO firearms or parts will be tested in the Labs unless they are accompanied by a Work Request, and both are delivered to the Labs by the designer or engineer. All Work Requests are to be filled out in detail. No Exceptions.

DATE COMPLETED: ____

TEST COMPLETED BY: ____

REPORT DATE: ____

RO-40-6

REMINGTON ARMS COMPANY, INC.

INTER-DEPARTMENTAL CORRESPONDENCE

Remington / PETERS

"CONFINE YOUR LETTER TO ONE SUBJECT ONLY"

Distribution: C. B. Workman
C. E. Ritchie
J. W. Brooks
J. P. Linde

RESEARCH TEST and MEASUREMENT REPORT – Report No. 830423
Supplement No. 1

M/700 MODIFIED TRIGGER CONNECTOR EVALUATION

Prepared by: R. Howe

Date Prepared: February 23, 1983

Proofread and Cleared By:

J.H. Hennings, Foreman-Test Lab / R.E. Nightingale, Foreman-Measurement Lab

R. E. Nightingale 2-28-83
Signature Date

C.E. Ritchie,
Sr. Supervisor - Testing,
Meas. & Mech. Analysis Lab

C. Evan Ritchie 2/25/83
Signature Date

TEST & MEASUREMENT LAB REPORT

REPORT NUMBER: 830423

REPORT TITLE: M/700 MODIFIED TRIGGER CONNECTOR EVALUATION
Supplement No. 1

MODEL(S): 700

GAUGE OR CALIBER: .308

DATE: 2/23/83

WORK ORDER NO.: G-0460-000X

PART NAME: Trigger Connector

DESIGNER/ENGINEER: J. W. Brooks

TEST TYPE:

1. PHOTO LAB
2. STRENGTH TEST - NO. OF GUNS TESTED ______
3. FUNCTION TEST - NO. OF GUNS TESTED 7
4. ACCURACY TEST - NO. OF GUNS TESTED ______
5. MEASUREMENTS - TYPE: Sear Lift Safe "On-Off", Trigger Pull
6. ENVIRONMENTAL TEST
7. AMMUNITION TESTING & EVALUATION - TYPE: ______
8. VISUAL EVALUATION - ______ OUT OF ______ GUN SAMPLE
9. ENDURANCE - NO. OF GUNS TESTED: 7

   Dry Cycle Rounds – 25,000
   NO. OF ROUNDS PER GUN: 100
   Total Dry-Cycle Rounds – 175,000
   TOTAL ROUNDS FIRED IN TEST: 700

   AMMO TYPE: MAGS. ______; TARGET: ______

   RIM FIRE ______ CENTER FIRE X

February 23, 1983

TO: C. B. WORKMAN

FROM: R. W. HOWE

REPORT TITLE: M/700 MODIFIED TRIGGER CONNECTOR EVALUATION
Supplement No. 1

ABSTRACT

Recently R & D Test Lab received seven (7) more M/700's with trigger connectors from the vendor which were slightly (0.001" to 0.003") undersized. Process Engineering through J. W. Brooks, Supervisor, Current Products Design, requested a follow-up test of these assemblies to supplement the original Report No. 830423 of February 12, 1983, to determine whether this dimensional difference would adversely affect the safe operation of the trigger assembly or the M/700 rifle itself.

SCOPE CF TEST

To evaluate the undersized M/700 trigger connector by testing seven (7) specially prepared M/700 rifles. Three (3) rifles would have a minimum stack-up of dimensional tolerances and four (4) would have a maximum stack-up of dimensional tolerances.

Refer to sketches in Appendix "A".

TEST RESU LTS

At no time during the entire test of the seven (7) M/700 rifles, with the specially prepared fire controls, did any trigger related malfunctions occur.

REPORT TEXT

1. Sear Lift measurements were taken and recorded on all seven (7) test rifles before dry-cycling.

2. All seven (7) test rifles were dry-cycled to 25,000 cycles each with no trigger related malfunctions.

3. Sear Lift, Safe "On-Off" pound forces and trigger pull measurements were taken at the conclusion of 25,000 each dry-cycle test.

   Present Remington Specs. are:
   Sear Lift – 0.005" to 0.018"
   Safe "On-Off" forces – none established
   Trigger Pull – 3.0 lbs. to 5.0 lbs.

4. The seven (7) rifles were then Jack Fired 100 live rounds each using Remington 180 grain P.S.P. ammo. with no trigger related malfunctions.

5. All seven (7) rifles were then pendulum drop tested against both a neoprene and a hardwood back stop at the three foot level in the following modes.:

   Muzzle first with Safe "On" and with Safe "Off"
   Butt first with Safe "On" and with Safe "Off"
   Left side with Safe "On" and with Safe "Off"
   Right side with Safe "On" and with Safe "Off"

   NOTE: It was noted that the three ~~minute~~ MINIMUM condition test rifles had a higher reading on trigger pull, Safe "On-Off" and Sear Lift measurements than the four maximum condition rifles.

   Refer to Appendix "A" Data Sheets for individual results.

TEST PROCEDURE

A. Measurements:

1. Sear Lift was measured at the start and the conclusion of the dry-cycle test.

2. Safe "On - Off" forces and trigger pull measurements were taken at the conclusion of the dry-cycle test.

B. Test Conditions:

1. Sear Lift was measured on all seven (7) rifles at the start of the test using the optical comparitor in the R & D Model Shop.

2. All seven (7) test rifles were dry-cycle tested on the four cock and fire dry-cycle machines in the R & D Test Lab Dry-Cycle Room. Each rifle was lubricated liberally with DuPont Teflon Wet Lubricant in and around the bolt cocking cam surface, sear safety cam (top) and trigger housing inspection hole every 5,000 cycles starting at 0 cycles.

3. Sear Lift, Trigger Pull and Safe "On - Off" forces were then taken on the seven (7) rifles; Sear Lift—using the above mentioned optical comparator. Trigger pull was taken using a Chatillon Model In-10 Spring Pull Scale. Safe "On-Off" forces were measured using a Chatillon DPP - 25 lb. Push-Pull Scale.

4. After above measurements were taken, all seven (7) rifles were live fire jack tested 100 rounds each with Remington 180 grain P.S.P. Ammunition in the R & D Lab Shooting Room. All rifles were shot 20 rounds each, then allowed to cool (able to touch with the hand) until all 100 rounds had been shot.

5. A Pendulum Drop Test was then conducted on all seven (7) rifles at the three foot test height on both hardwood and neoprene back stops from the muzzle, butt and both sides.

C. Ammunition:

Remington .308 cal. 180 grain P.S.P. Code R-308W3.

D. Rifles used in test:

Rifle No. 2	Serial No. B6440199	Max. Condition
Rifle No. 3	Serial No. B6440277	
Rifle No. 11	Serial No. B6440458	
Rifle No. 1	Serial No. B6440172	
Rifle No. 9	Serial No. B6438686	Min. Condition
Rifle No. 4	Serial No. B6438163	
Rifle No. 6	Serial No. B6439730	

"APPENDIX "A"

REPORT #830423

M/700 MODIFIED TRIGGER CONNECTOR EVALUATION
SUPPLIMENT #1

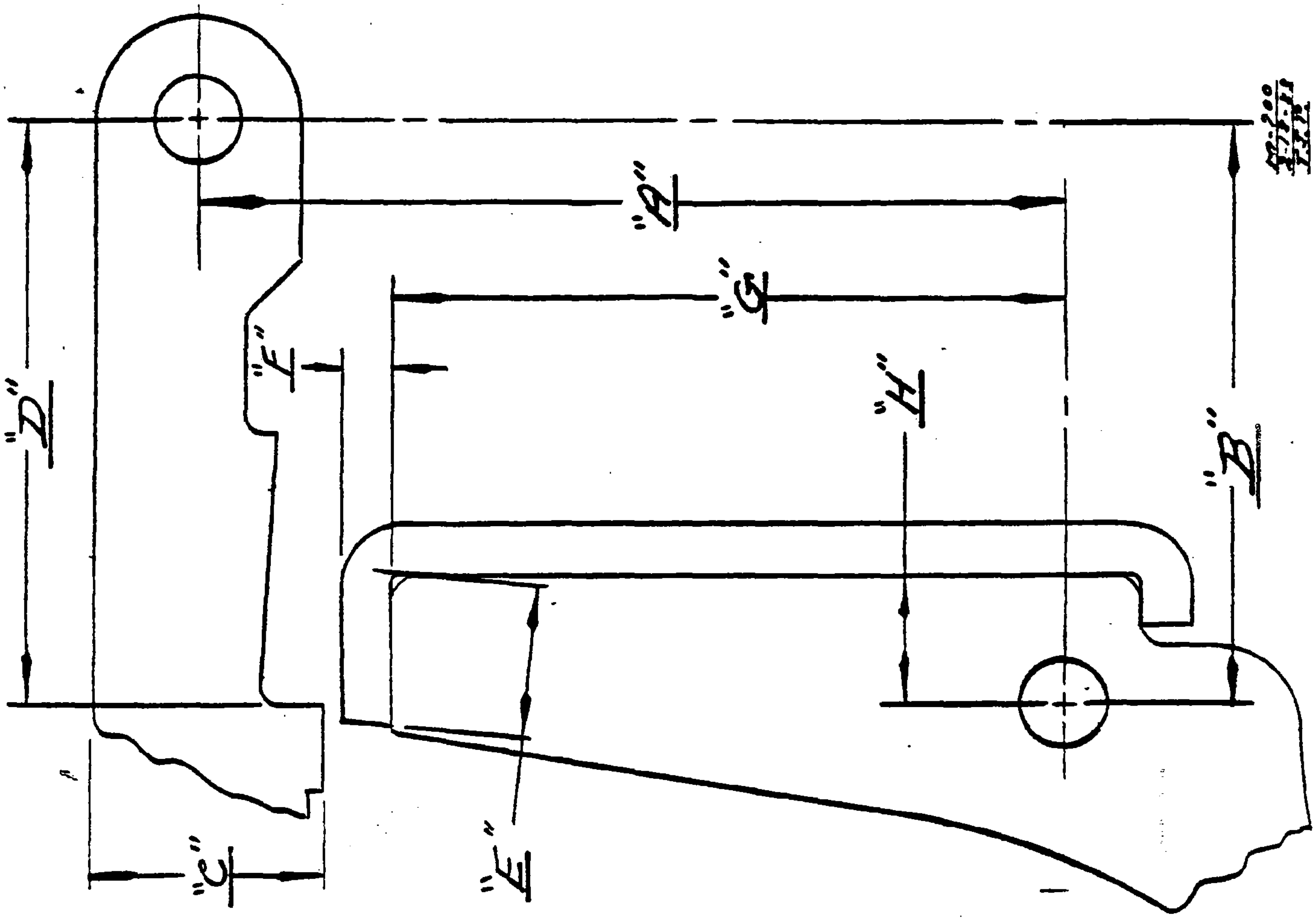
2-23-83 R. HOWE

GUN SER NO.	B6440199	B6440277	B6440458	B6440172	B6438686	B6438163	B6439730	
FIRE CONTROL NO.	2	3	11	1	9	4	6	REMINGTON SPEC.
CONDITION	MAX.	MAX.	MAX.	MAX	MIN.	MIN.	MIN.	
SEAR LIFT 0 CYCLES	.008"	.010"	.007"	.009"	.022"	.023"	.023"	.005" TO .018"
DRY CYCLES	25,000	25,000	25,000	25,000	25,000	25,000	25,000	
RESULTS	OK	OK	OK	OK	OK	OK	OK	
SEAR LIFT 25,000 CYCLES	.008"	.010"	.007"	.009"	.022"	.023"	.023"	.005" TO .018"
TRIGGER PULL LBS. (RESULT OF THREE MEASUREMENTS)	5.00	4.50	5.00	5.50	6.00	6.33	8.91	3.0 TO 5.0 LBS.
SAFE "ON" LBS. (RESULT OF THREE MEASUREMENTS)	6.3	7.0	6.7	5.0	20.0	24.0	11.2	NONE ESTABLISHED
SAFE "OFF" LBS. (RESULT OF THREE MEASUREMENTS)	7.0	6.7	7.6	5.1	9.5	7.6	6.0	NONE ESTABLISHED
DROP TEST 3'								
SAFE POSITION → NEOPRENE PAD	ON / OFF	ON / OFF	ON / OFF	ON / OFF	ON / OFF	ON / OFF	ON / OFF	
MUZZLE FIRST	OK / OK	OK / OK	OK / OK	OK / OK	OK / OK	OK / OK	OK / OK	
BUTT FIRST	" / "	" / "	" / "	" / "	" / "	" / "	" / "	
RIGHT SIDE	" / "	" / "	" / "	" / "	" / "	" / "	" / "	
LEFT SIDE	" / "	" / "	" / "	" / "	" / "	" / "	" / "	
HARD WOOD PAD	OK / OK	OK / OK	OK / OK	OK / OK	OK / OK	OK / OK	OK / OK	
MUZZLE FIRST	" / "	" / "	" / "	" / "	" / "	" / "	" / "	
BUTT FIRST	" / "	" / "	" / "	" / "	" / "	" / "	" / "	
RIGHT SIDE	" / "	" / "	" / "	" / "	" / "	" / "	" / "	
LEFT SIDE	" / "	" / "	" / "	" / "	" / "	" / "	" / "	
NO. LIVE ROUNDS FIRED	100	100	100	100	100	100	100	
RESULTS	OK	OK	OK	OK	OK	OK	OK	

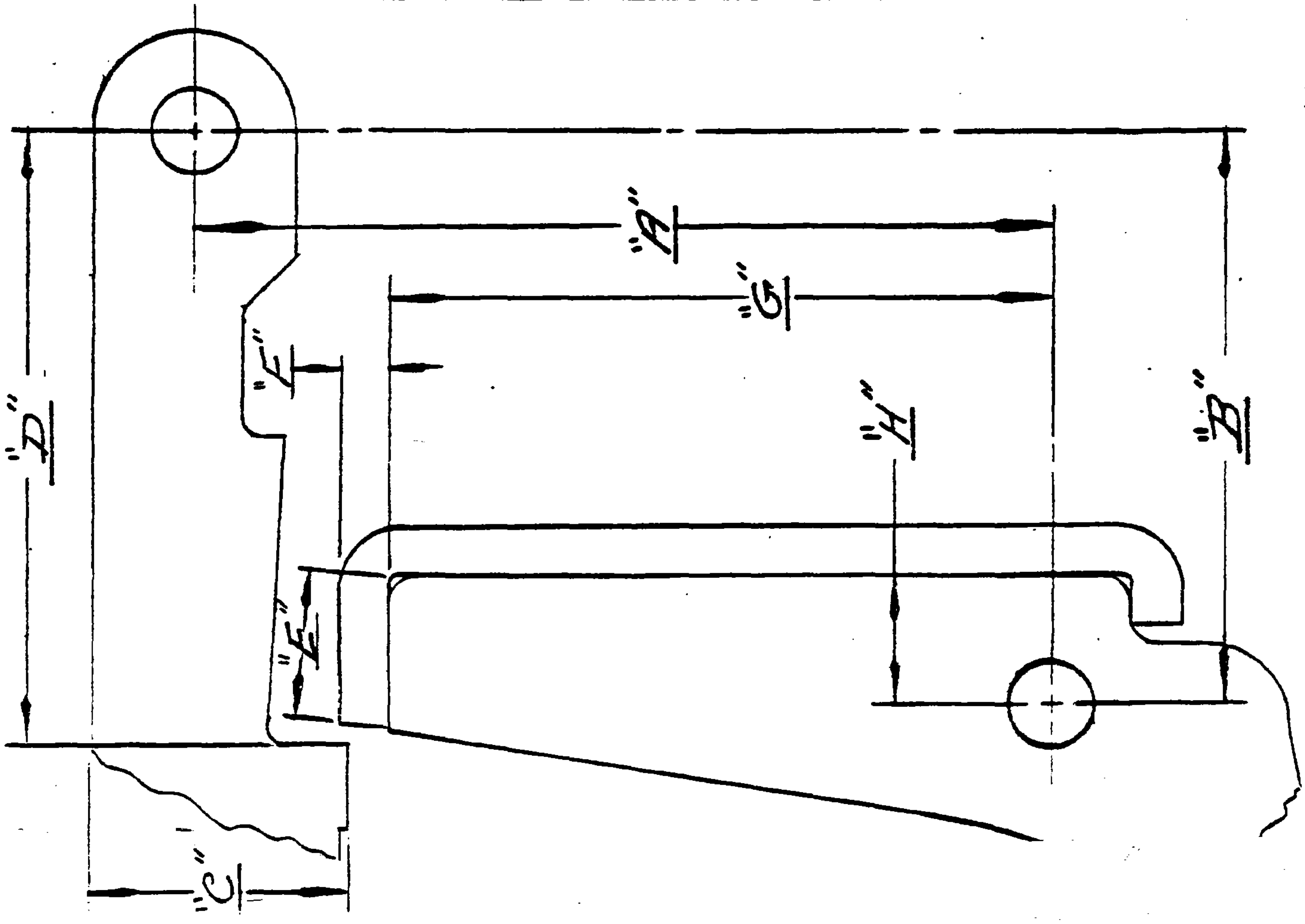
Ammo. - Cal 308 180 GR PSP

Report No. 830423
Supplement No. 1
2-23-83

Condition No. 2



Condition No. 1



Report No. 830423
Supplement No. 1
2-23-83

CONDITION NO.		1	1	1	2	2	2	1	2	2	1	1	2
TRIGGER HOUSING ASSEMBLY NO.		1	2	3	4	5	6	7	8	9	10	11	12
	Dim.												
HOUSING	A	1.2395	1.2385	1.2395	1.241	1.2405	1.240	1.2385	1.2385	1.2405	1.240	1.238	1.2395
	B	.8395	.839	.8395	.841	.8415	.841	.840	.8405	.8405	.8385	.839	.842
SEAR	C	.1975-.198	.1975-.198	.1975-.198	.186	.1865	.1865	.1975	.1855	.1855	.1975	.1975-.198	.1865
	D	.8705-.871	.870-.8695	.8705-.871	.8655	.8655	.8645	.870-.8695	.863	.865	.871	.869-.8695	.8645
CONNECTOR	E	.215	.215	.215	.225	.225	.225	.215	.225	.225	.215	.215	.225
	F	.074	.072-.0715	.071-.0705	.071	.071	.071	.074	.071	.071	.074	.072-.0715	.071
TRIGGER	G	.972	.975	.975	.967	.967	.967	.9725	.967	.967	.9725	.975	.967
	H	.190	.190	.190	.186	.186	.186	.190	.186	.186	.190	.190	.186
		B6440172	B6440199	B6440277	B6438163		B6439730			B6438686		B6440458	

JWB:js
2/18/83

Report No. 830423

RESEARCH TEST & MEASUREMENT LAB WORK REQUEST

AREA OF TESTING

___ Developmental
___ Design Acceptance
___ Pre-Pilot
___ Pilot
___ Production Acceptance

___ Safety Related
___ Competitive Evaluation
___ New Design
___ Design Change
✓ Plant Assistance

___ Litigation
___ Warehouse Audit
___ Cost Reduction
Stake: ___
___ Other

FIREARM STAT'S.

MODEL: 700
CAL or GAGE: Any
BARREL TYPE: —
PROOFED: YES ___ NO ___

REPORT REQ'D.

FORMAL ✓
TEST RESULTS ONLY ___

DATE REQUESTED: 2-11-83
DATE NEEDED BY: 2-14-83
REQUESTED BY: J. LINDE
WORK ORDER NO: G0460-000X

TEST TYPE

___ Strength Test
✓ Function Test
___ Accuracy Test
___ Ammunition Test
___ Environmental Test
___ Customer Complaint
✓ Dry Cycle Test
___ Measurements
✓ Endurance Test
___ Photo/Video
___ Other ___

EXPLAIN IN DETAIL THE REASON FOR THIS TEST:

- Dry cycle rifles with single Trigger assemblies 7, 10 and 4, 5 to 25,000 cycles
- Shoot 100 rounds - fast shooting + check for any Trigger related malfunctions
- Drop test from 3' on the muzzle, Butt, + sides, check for rifle firing.

GUNS REQUIRED: 4

New trigger connector (min./max.) conditions.

(Test Results to go to CB Workman immediately)

NOTE: NO firearms or parts will be tested in the Labs unless they are accompanied by a Work Request, and both are delivered to the Labs by the designer or engineer. All Work Requests are to be filled out in detail. No Exceptions.

DATE COMPLETED: ___
TEST COMPLETED BY: ___
REPORT DATE: ___

FOR ENCLOSURE

DATE 2/22

TO: R. Howe

FROM: Evan

Please Discuss With	For Approval	For Attention	For Information	Note and Forward To File	Note and Return To Sender	Forwarded Per Your Request

Pls hold onto
this material
in the file

DON'T SAY IT—*WRITE IT*

#830423

To ______ Location ______

From ______ Location ______ Phone No. ______

Subject ______ Date ______

[redacted]

FIRE CONTROL OR PACKET #

# 8	SERIAL	# B6440493	PACKET # 8
# 5	"	# B6438179	# 5
# 7	"	# B6438908	# 7
# 10	"	# B6438658	# 10
#9	"	# B6438686	
#4	"	# 6438163	
#6	"	# 6439730	
#2	"	# 6440199	
#3	"	# 6440277	
#11	"	# 6440458	
#1	"	# 6440172	

DONE

G-88 REV. 10-62

SECURITY IS EVERYONE'S RESPONSIBILITY

CONDITION NO.		1	1	1	2	2	2	1	2	2	1	1	2
TRIGGER HOUSING ASSEMBLY NO.		1	2	3	4	5	6	7	8	9	10	11	12
	Dim.												
HOUSING	A	1.2395	1.2385	1.2395	1.241	1.2405	1.240	1.2385	1.2385	1.2405	1.240	1.238	1.2395
	B	.8395	.839	.8395	.841	.8415	.841	.840	.8405	.8405	.8385	.839	.842
SEAR	C	.1975-.198	.1975-.198	.1975-.198	.186	.1865	.1865	.1975	.1855	.1855	.1975	.1975-.198	.1865
	D	.8705-.871	.870-.8695	.8705-.871	.8655	.8655	.8645	.870-.8695	.863	.865	.871	.869-.8695	.8645
CONNECTOR	E	.215	.215	.215	.225	.225	.225	.215	.225	.225	.215	.215	.225
	F	.074	.072-.0715	.071-.0705	.071	.071	.071	.074	.071	.071	.074	.072-.0715	.071
TRIGGER	G	.972	.975	.975	.967	.967	.967	.9725	.967	.967	.9725	.975	.967
	H	.190	.190	.190	.186	.186	.186	.190	.186	.186	.190	.190	.186

JWB:js
2/18/83

CONDITION NO.		1	1	1	2	2	2	1	2	2	1	1	2
TRIGGER HOUSING ASSEMBLY NO.		1	2	3	4	5	6	7	8	9	10	11	12
	Dim.												
HOUSING	A	1.2395	1.2385	1.2395	1.241	1.2405	1.240	1.2385	1.2385	1.2405	1.240	1.238	1.2395
	B	.8395	.839	.8395	.841	.8415	.841	.840	.8405	.8405	.8385	.839	.842
SEAR	C	.1975-.198	.1975-.198	.1975-.198	.186	.1865	.1865	.1975	.1855	.1855	.1975	.1975-.198	.1865
	D	.8705-.871	.870-.8695	.8705-.871	.8655	.8655	.8645	.870-.8695	.863	.865	.871	.869-.8695	.8645
CONNECTOR	E	.215	.215	.215	.225	.225	.225	.215	.225	.225	.215	.215	.225
	F	.074	.072-.0715	.071-.0705	.071	.071	.071	.074	.071	.071	.074	.072-.0715	.071
TRIGGER	G	.972	.975	.975	.967	.967	.967	.9725	.967	.967	.9725	.975	.967
	H	.190	.190	.190	.186	.186	.186	.190	.186	.186	.190	.190	.186

JWB:js
2/18/83

CONDITION NO.		1	1	1	2	2	2	1	2	2	1	1	2
TRIGGER HOUSING ASSEMBLY NO.		1	2	3	4	5	6	7	8	9	10	11	12
	Dim.												
HOUSING	A	1.2395	1.2385	1.2395	1.241	1.2405	1.240	1.2385	1.2385	1.2405	1.240	1.238	1.2395
	B	.8395	.839	.8395	.841	.8415	.841	.840	.8405	.8405	.8385	.839	.842
SEAR	C	.1975-.198	.1975-.198	.1975-.198	.186	.1865	.1865	.1975	.1855	.1855	.1975	.1975-.198	.1865
	D	.8705-.871	.870-.8695	.8705-.871	.8655	.8655	.8645	.870-.8695	.863	.865	.871	.869-.8695	.8645
CONNECTOR	E	.215	.215	.215	.225	.225	.225	.215	.225	.225	.215	.215	.225
	F	.074	.072-.0715	.071-.0705	.071	.071	.071	.074	.071	.071	.074	.072-.0715	.071
TRIGGER	G	.972	.975	.975	.967	.967	.967	.9725	.967	.967	.9725	.975	.967
	H	.190	.190	.190	.186	.186	.186	.190	.186	.186	.190	.190	.186

JWB:js
2/18/83

CONDITION NO.		1	1	1	2	2	2	1	2	2	1	1	2
TRIGGER HOUSING ASSEMBLY NO.		1	2	3	4	5	6	7	8	9	10	11	12
	Dim.												
HOUSING	A	1.2395	1.2385	1.2395	1.241	1.2405	1.240	1.2385	1.2385	1.2405	1.240	1.238	1.2395
	B	.8395	.839	.8395	.841	.8415	.841	.840	.8405	.8405	.8385	.839	.842
SEAR	C	.1975-.198	.1975-.198	.1975-.198	.186	.1865	.1865	.1975	.1855	.1855	.1975	.1975-.198	.1865
	D	.8705-.871	.870-.8695	.8705-.871	.8655	.8655	.8645	.870-.8695	.863	.865	.871	.869-.8695	.8645
CONNECTOR	E	.215	.215	.215	.225	.225	.225	.215	.225	.225	.215	.215	.225
	F	.074	.072-.0715	.071-.0705	.071	.071	.071	.074	.071	.071	.074	.072-.0715	.071
TRIGGER	G	.972	.975	.975	.967	.967	.967	.9725	.967	.967	.9725	.975	.967
	H	.190	.190	.190	.186	.186	.186	.190	.186	.186	.190	.190	.186

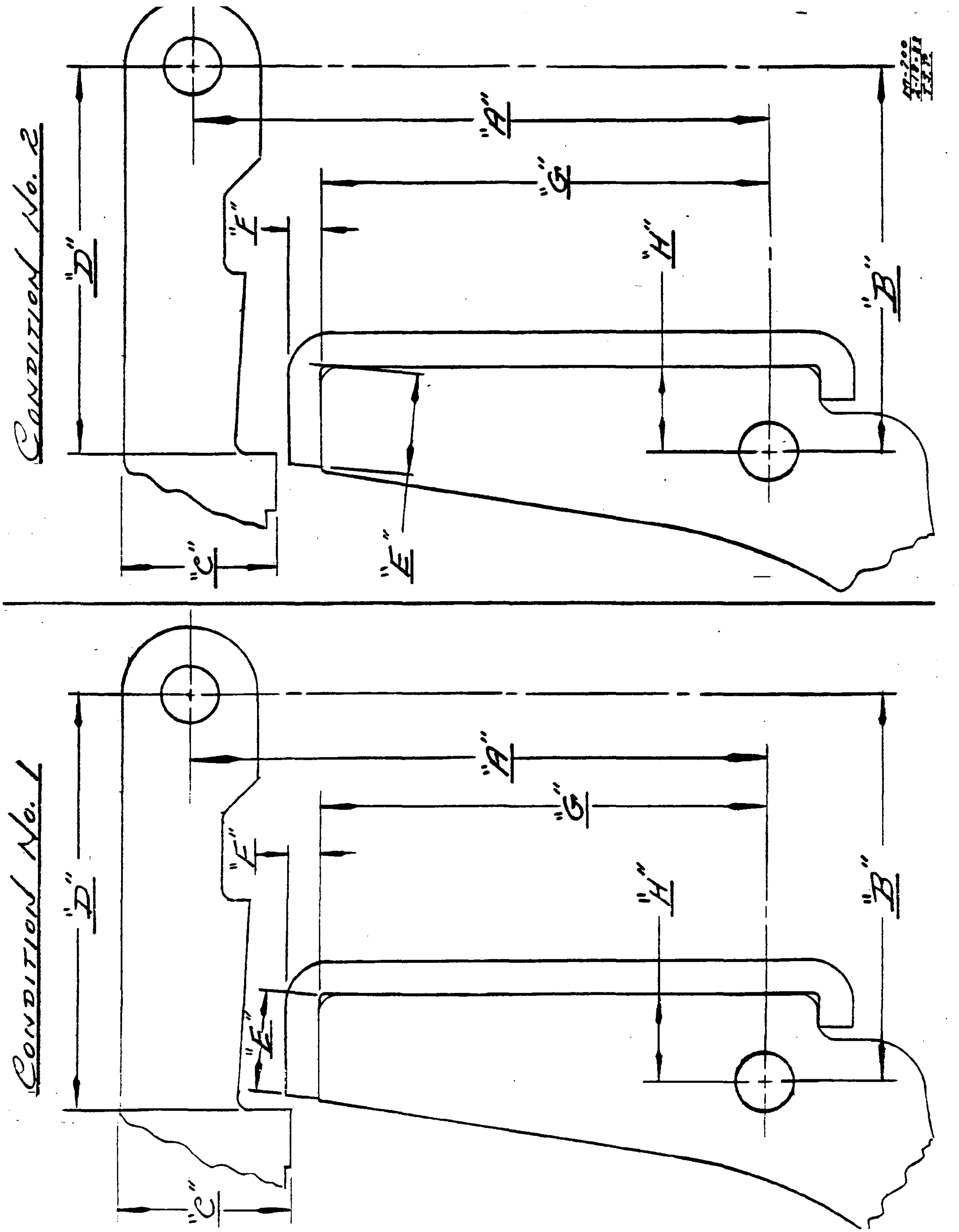
JWB:js
2/18/83

CONDITION NO.		1	1	1	2	2	2	1	2	2	1	1	2
TRIGGER HOUSING ASSEMBLY NO.		1	2	3	4	5	6	7	8	9	10	11	12
	Dim.												
HOUSING	A	1.2395	1.2385	1.2395	1.241	1.2405	1.240	1.2385	1.2385	1.2405	1.240	1.238	1.2395
	B	.8395	.839	.8395	.841	.8415	.841	.840	.8405	.8405	.8385	.839	.842
SEAR	C	.1975-.198	.1975-.198	.1975-.198	.186	.1865	.1865	.1975	.1855	.1855	.1975	.1975-.198	.1865
	D	.8705-.871	.870-.8695	.8705-.871	.8655	.8655	.8645	.870-.8695	.863	.865	.871	.869-.8695	.8645
CONNECTOR	E	.215	.215	.215	.225	.225	.225	.215	.225	.225	.215	.215	.225
	F	.074	.072-.0715	.071-.0705	.071	.071	.071	.074	.071	.071	.074	.072-.0715	.071
TRIGGER	G	.972	.975	.975	.967	.967	.967	.9725	.967	.967	.9725	.975	.967
	H	.190	.190	.190	.186	.186	.186	.190	.186	.186	.190	.190	.186

JWB:js
2/18/83

CONDITION NO.		1	1	1	2	2	2	1	2	2	1	1	2
TRIGGER HOUSING ASSEMBLY NO.		1	2	3	4	5	6	7	8	9	10	11	12
	Dim.												
HOUSING	A	1.2395	1.2385	1.2395	1.241	1.2405	1.240	1.2385	1.2385	1.2405	1.240	1.238	1.2395
	B	.8395	.839	.8395	.841	.8415	.841	.840	.8405	.8405	.8385	.839	.842
SEAR	C	.1975-.198	.1975-.198	.1975-.198	.186	.1865	.1865	.1975	.1855	.1855	.1975	.1975-.198	.1865
	D	.8705-.871	.870-.8695	.8705-.871	.8655	.8655	.8645	.870-.8695	.863	.865	.871	.869-.8695	.8645
CONNECTOR	E	.215	.215	.215	.225	.225	.225	.215	.225	.225	.215	.215	.225
	F	.074	.072-.0715	.071-.0705	.071	.071	.071	.074	.071	.071	.074	.072-.0715	.071
TRIGGER	G	.972	.975	.975	.967	.967	.967	.9725	.967	.967	.9725	.975	.967
	H	.190	.190	.190	.186	.186	.186	.190	.186	.186	.190	.190	.186

JWB:js
2/18/83



CONDITION No. 2
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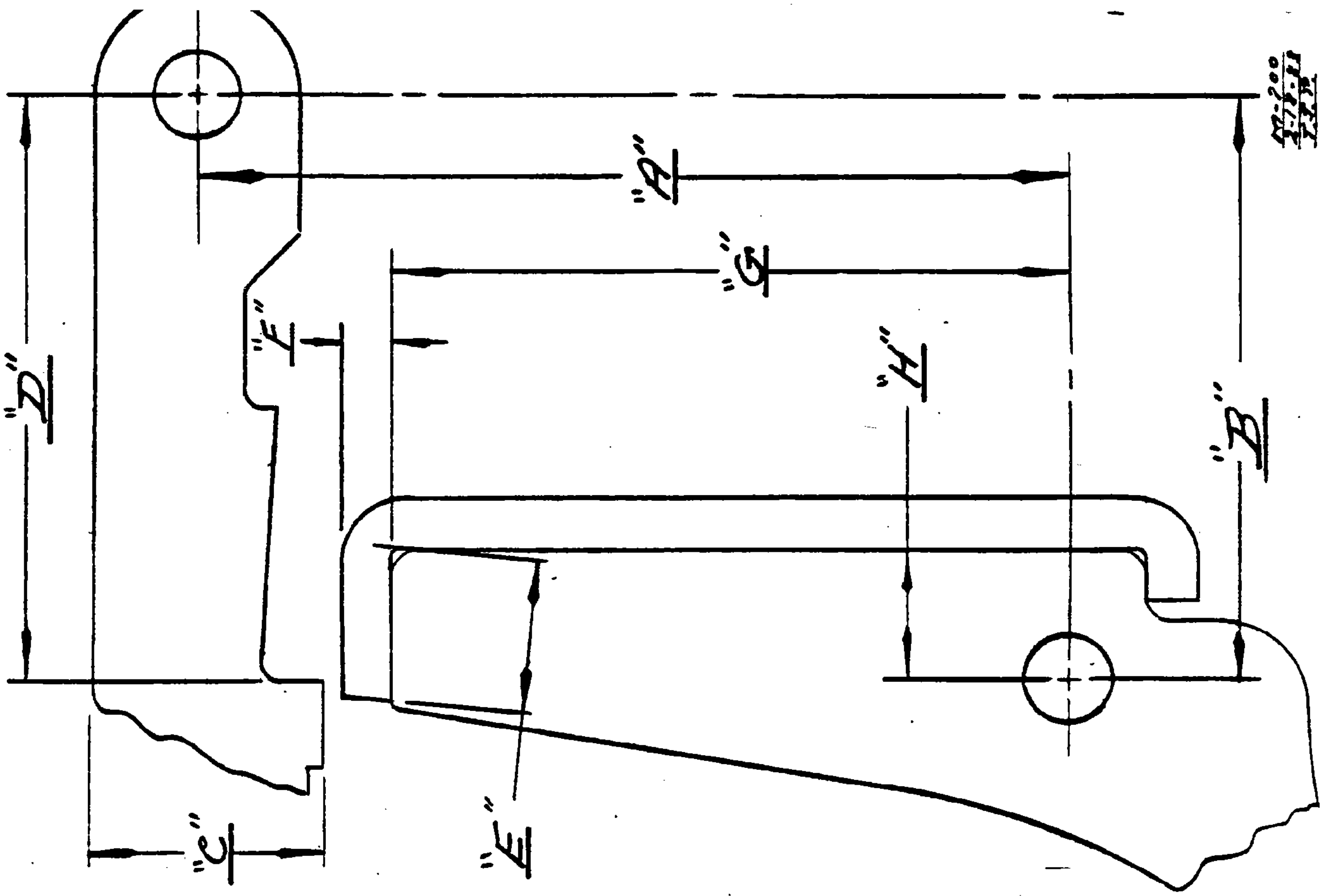
"F"
"H"
"D"
"B"
"E"
"C"
CONDITION No. 1
"A"
"G"
"F"
"H"
"D"
"B"
"E"
"C"

CONDITION No. 2



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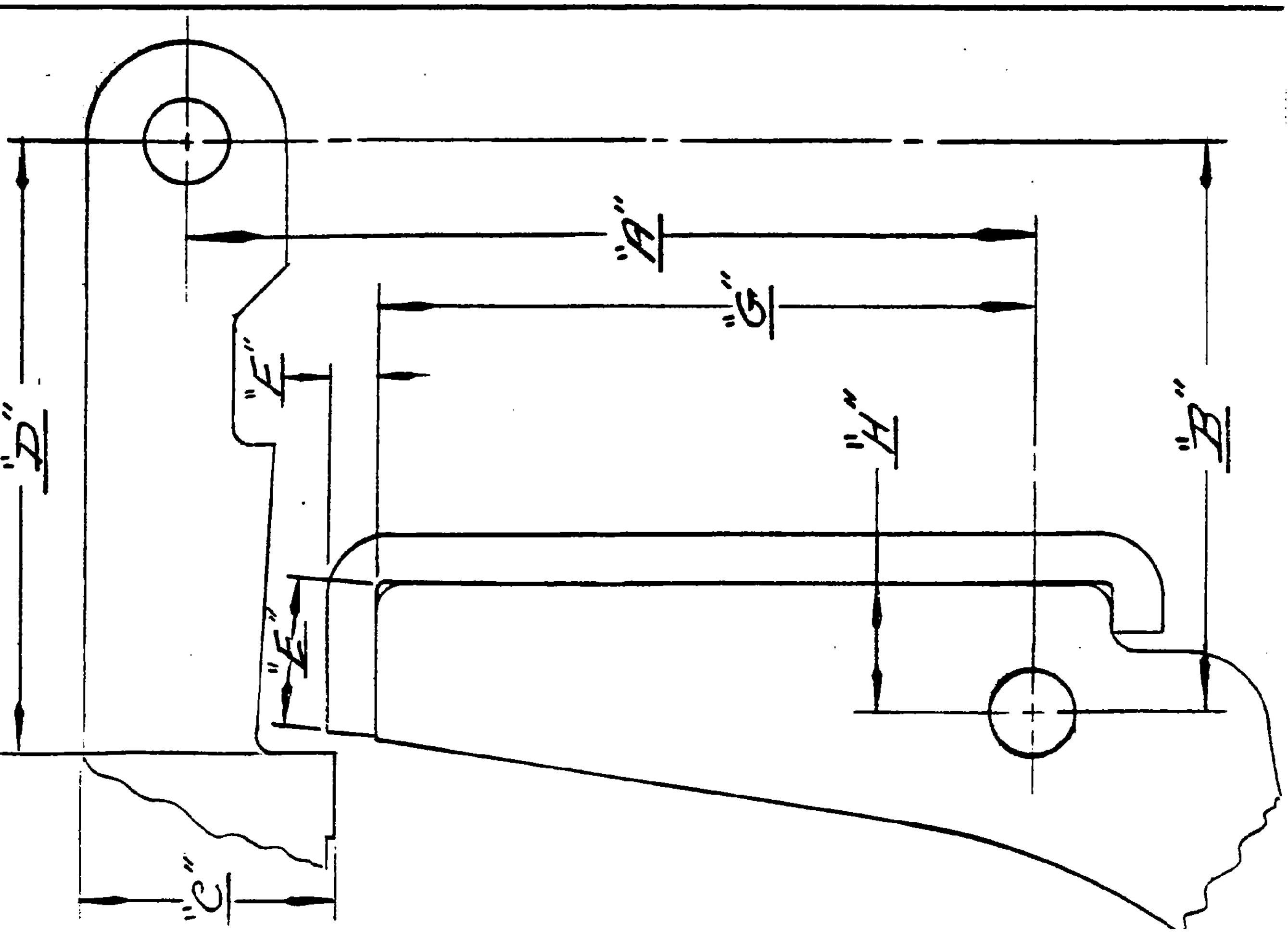

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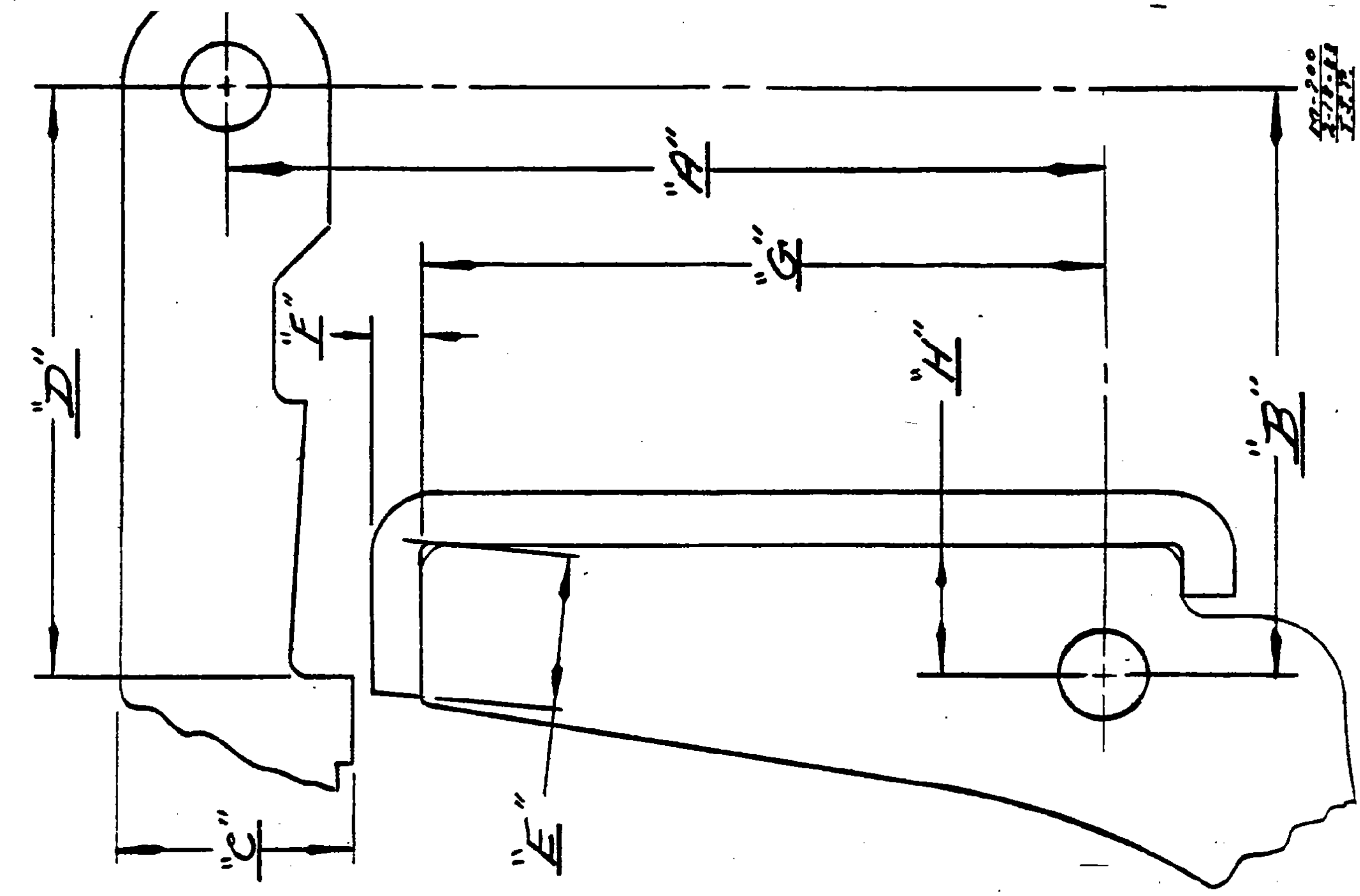

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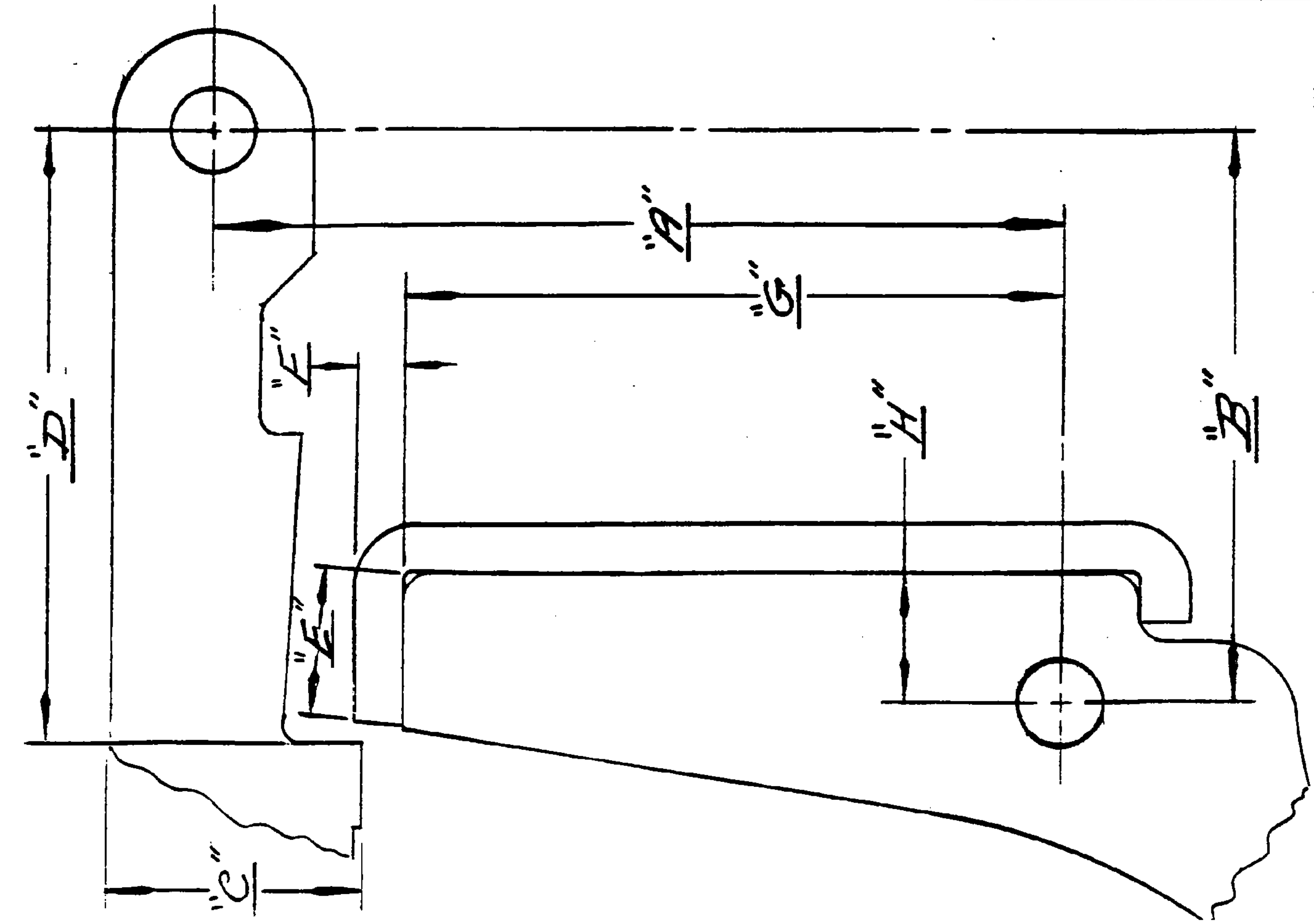

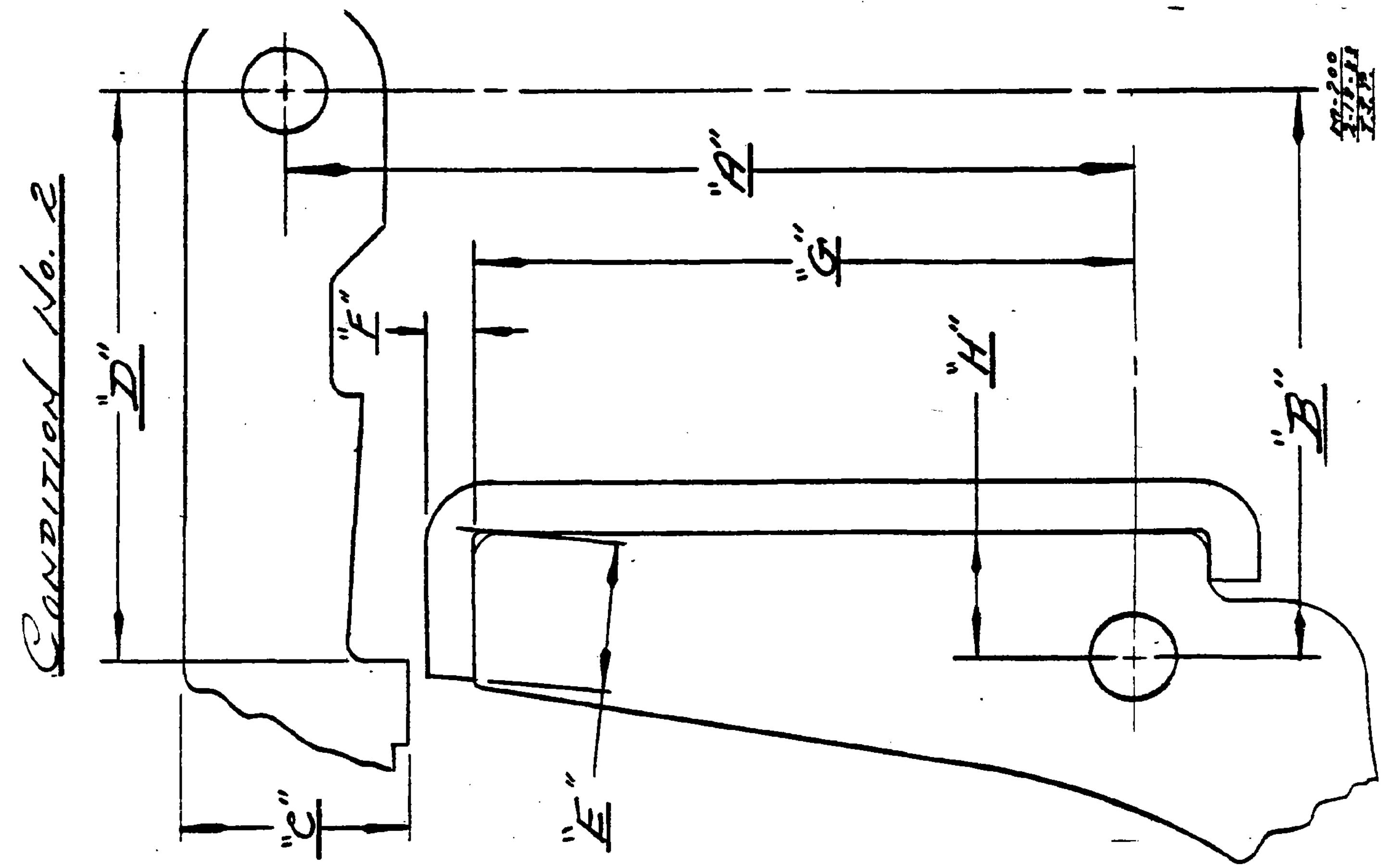
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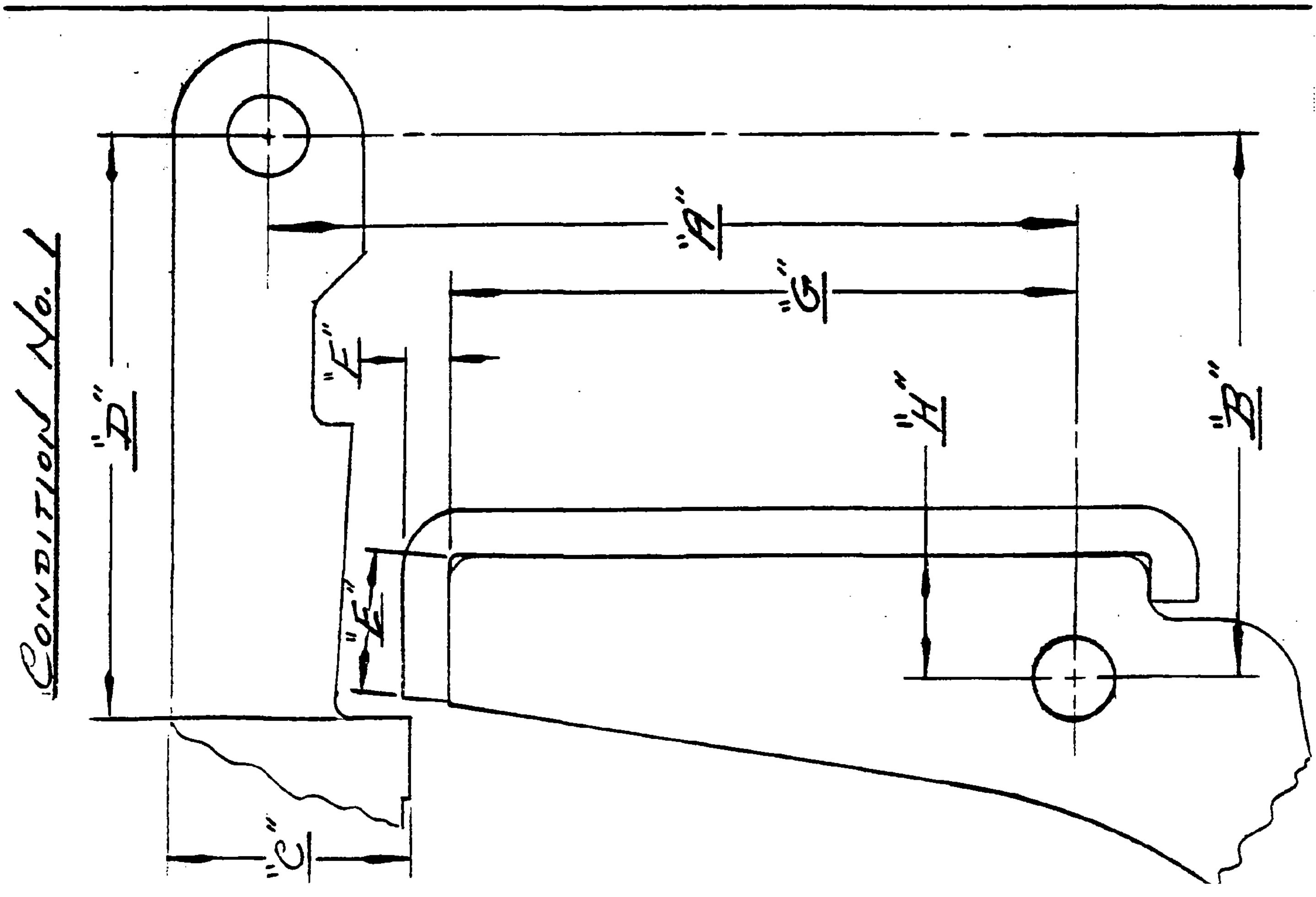
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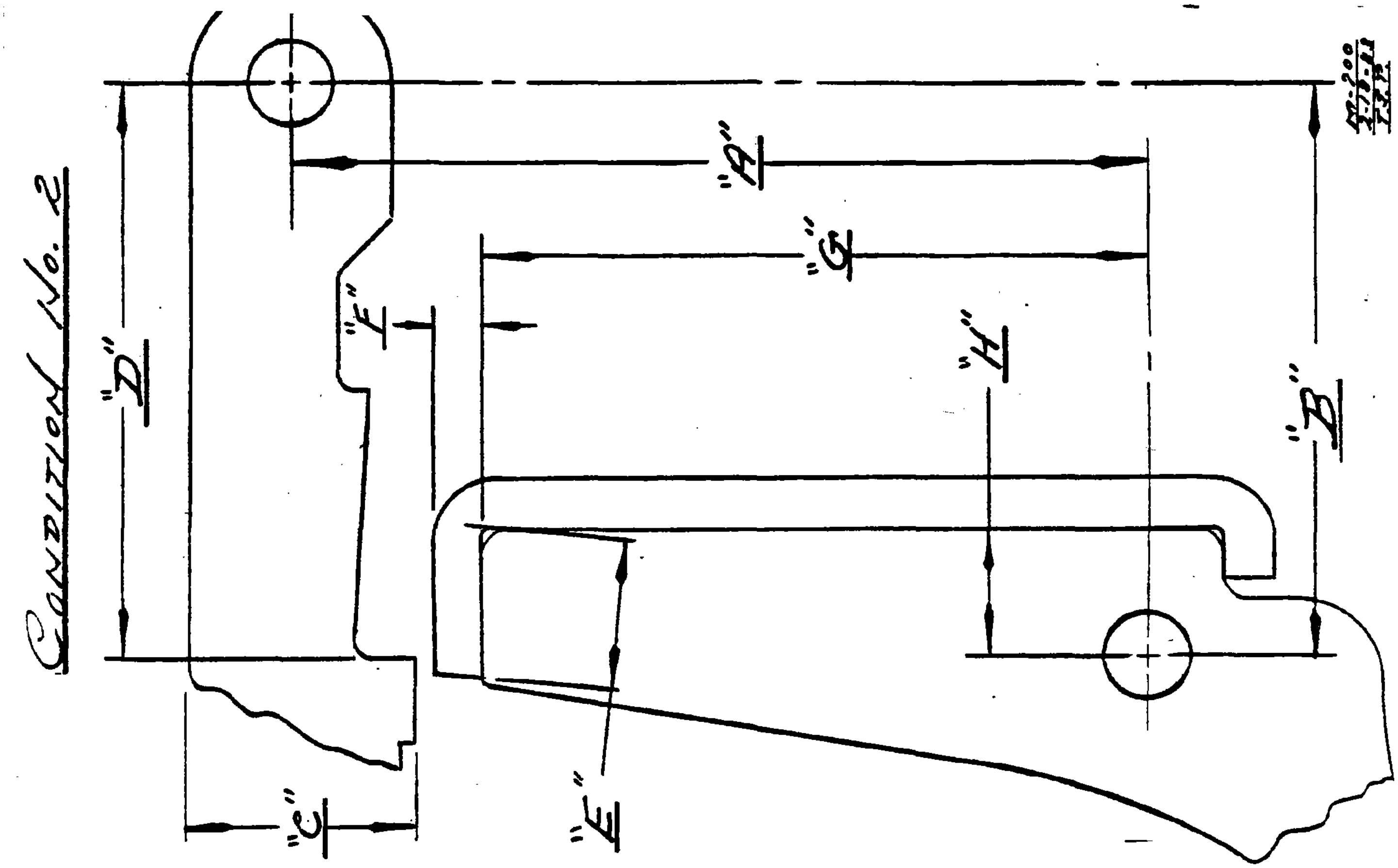
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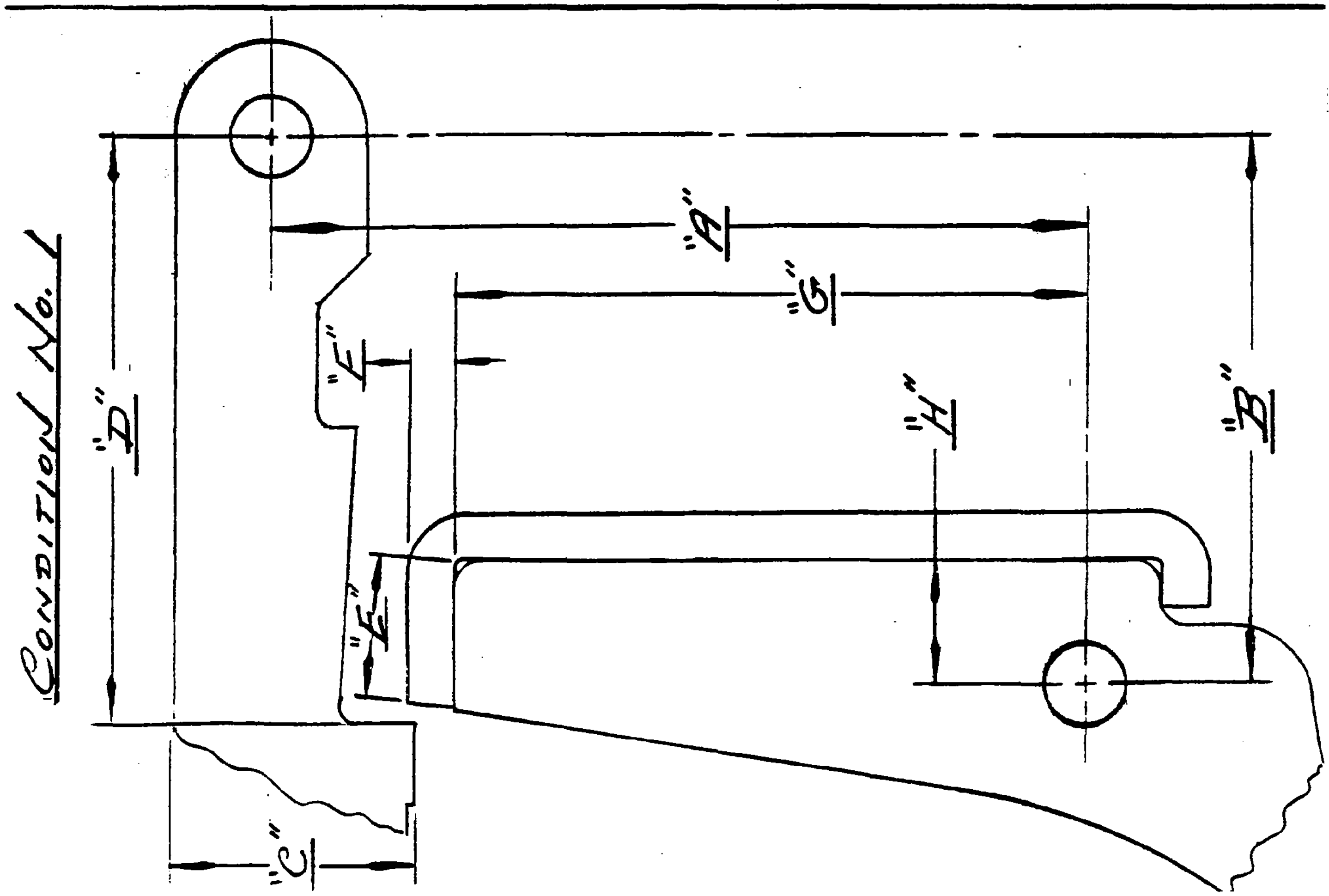
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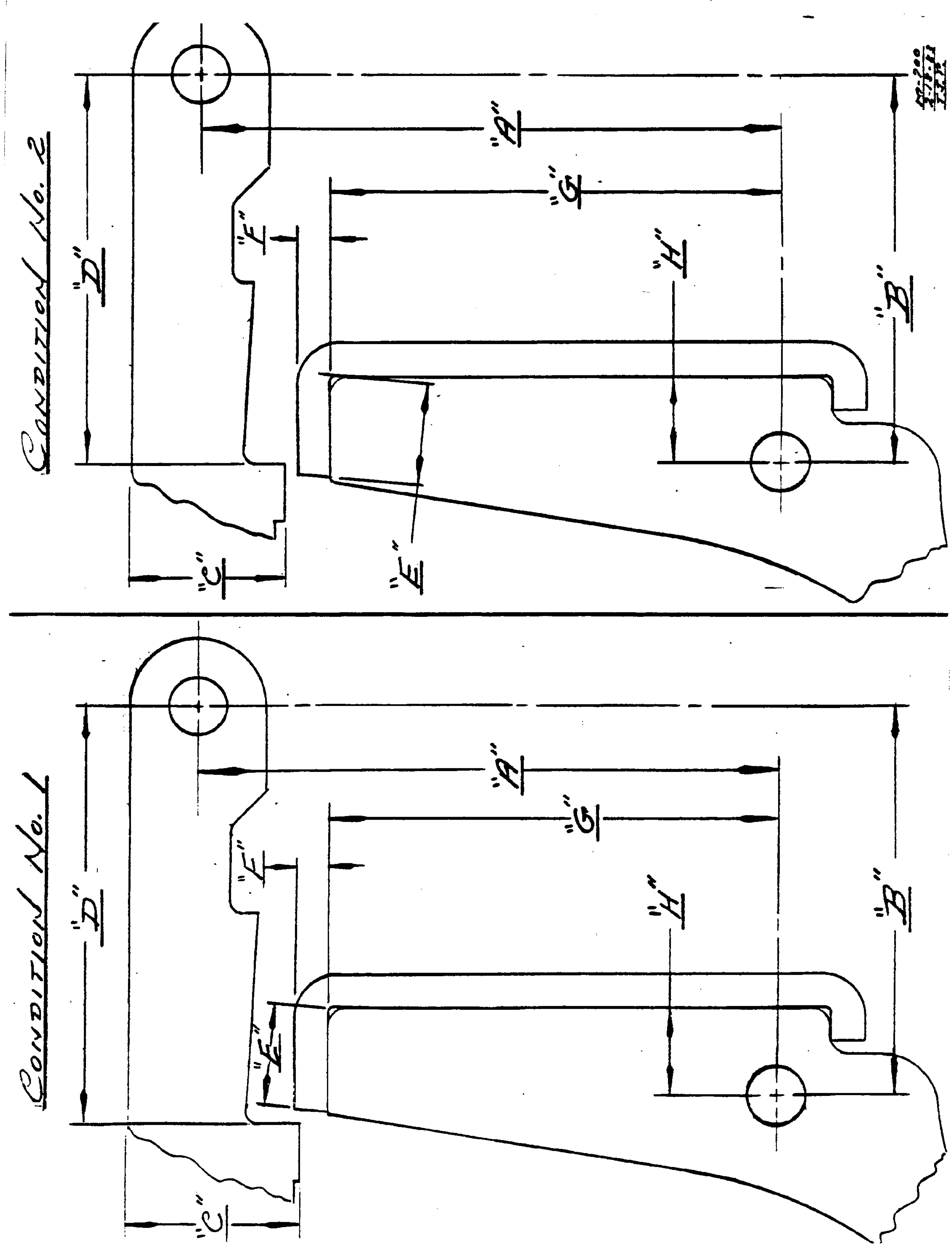
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CONDITION No. 1
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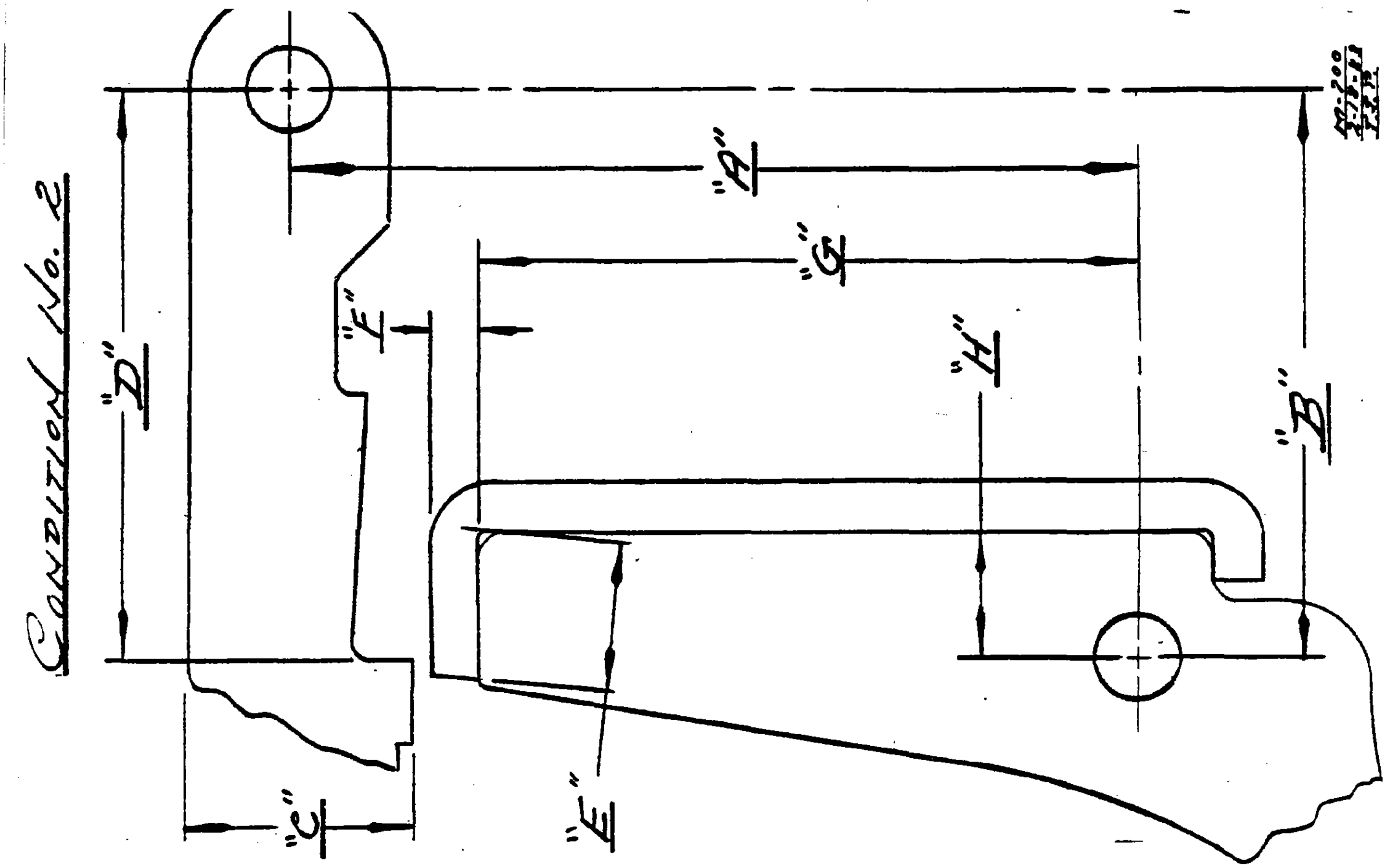
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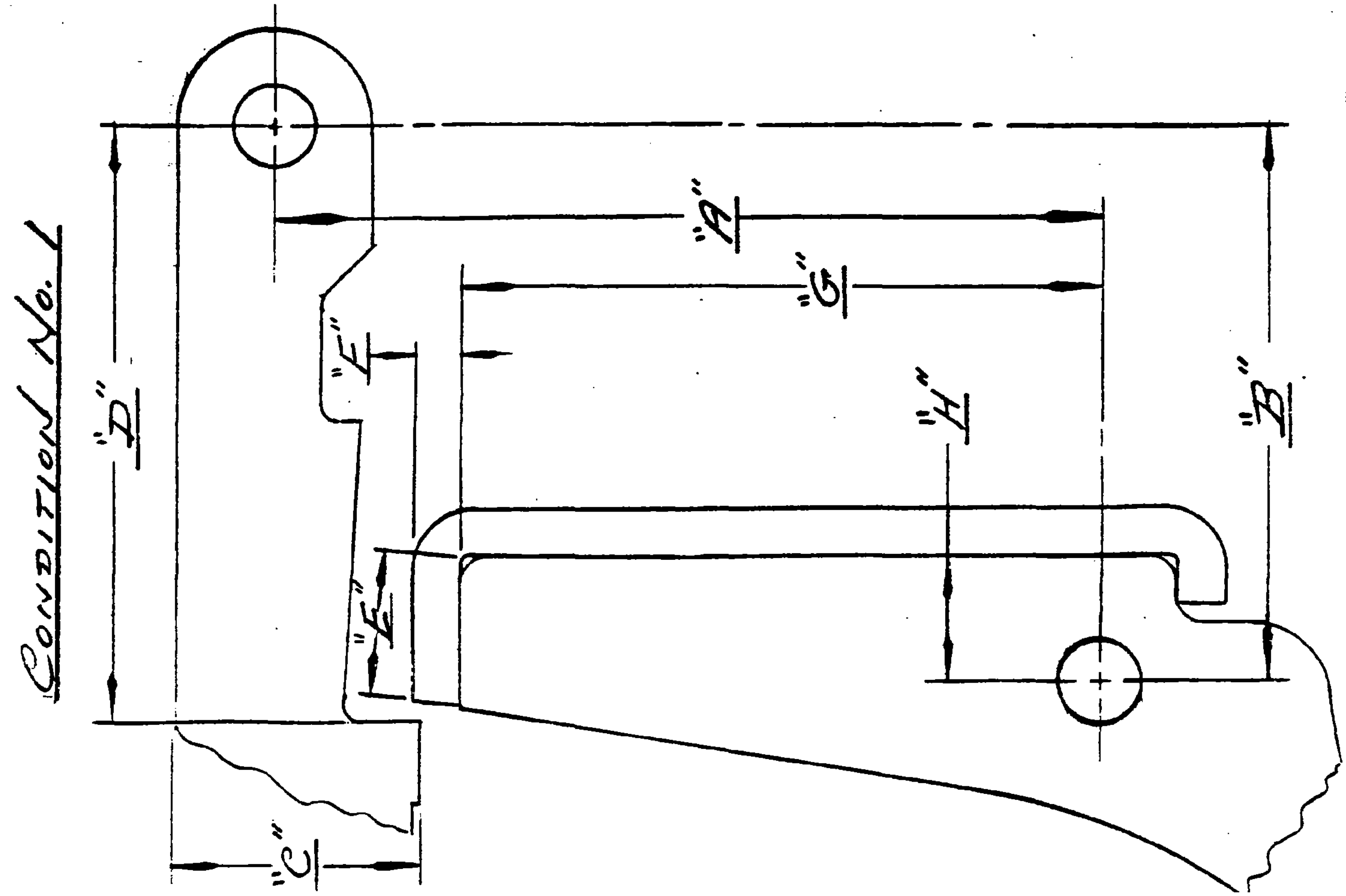
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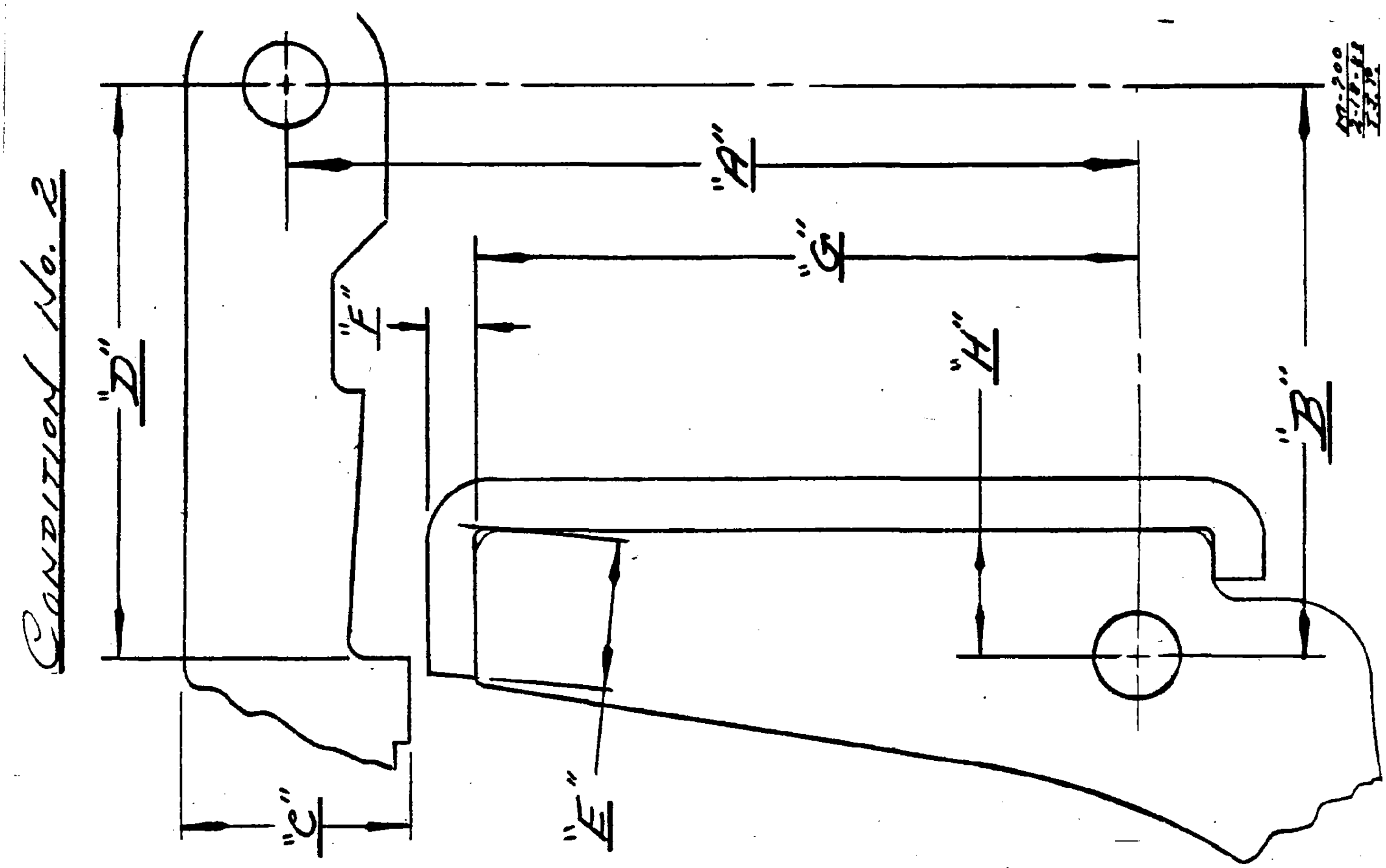
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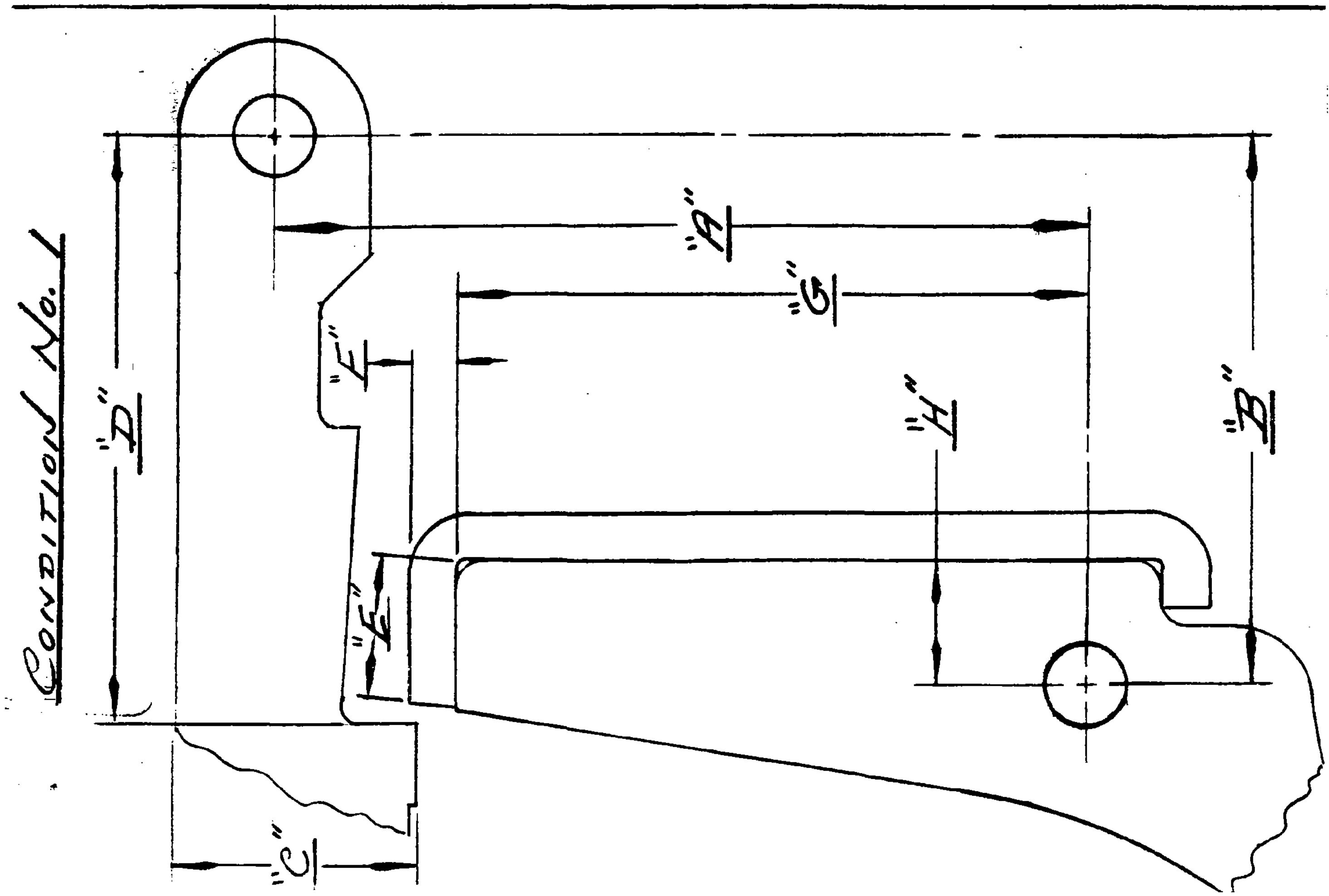
CONDITION No. 1
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"G"
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"H"
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"E"
"C"

CONDITION NO.		1	1	1	2	2	2	1	2	2	1	1	2
TRIGGER HOUSING ASSEMBLY NO.		1	2	3	4	5	6	7	8	9	10	11	12
	Dim.												
HOUSING	A	1.2395	1.2385	1.2395	1.241	1.2405	1.240	1.2385	1.2385	1.2405	1.240	1.238	1.2395
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SEAR	C	.1975-.198	.1975-.198	.1975-.198	.186	.1865	.1865	.1975	.1855	.1855	.1975	.1975-.198	.1865
	D	.8705-.871	.870-.8695	.8705-.871	.8655	.8655	.8645	.870-.8695	.863	.865	.871	.869-.8695	.8645
CONNECTOR	E	.215	.215	.215	.225	.225	.225	.215	.225	.225	.215	.215	.225
	F	.074	.072-.0715	.071-.0705	.071	.071	.071	.074	.071	.071	.074	.072-.0715	.071
TRIGGER	G	.972	.975	.975	.967	.967	.967	.9725	.967	.967	.9725	.975	.967
	H	.190	.190	.190	.186	.186	.186	.190	.186	.186	.190	.190	.186

JWB:js
2/18/83