FILE REF: GRT-565-9

SPECIAL EMERGENCY RESPONSE TEAM
TESTS/VERIFICATION OF TRAINING
PROVIDED BY NATIONAL INSTITUTE
FOR SPORTS VISION INC.

CONTENTS

S.E.R.T. TESTS/VERIFICATION TRAINING
PROVIDED BY
NATIONAL INSTITUTE FOR SPORTS VISION INC.

PROPOSAL

National Institute for Sports Vision Inc. (N.I.S.V.) will provide the S.E.R. Team a vision evaluation and training program which purports to increase the trainee's (assault/sniper) ability to gather information from a visual stimulus and further, to process that information and initiate responses to it more rapidly and accurately.

OBJECTIVE/HYPOTHESIS

To develop for S.E.R.T. duty related tests, to be administered coincidentally with the established program of N.I.S.V., which will tend to confirm findings of that study/training. If claims made by N.I.S.V. prove to be correct, an improved ability to gather visual information and initiate responses should be directly transferred to duty related skills.

DUTY RELATED SKILLS

1. SHOOTING
2. OBSERVATION
3. SELF DEFENCE

NON DUTY RELATED SKILL

1. VOLLEYBALL

OVERVIEW

LOCATION DWYER HILL TRAINING CENTRE, RICHMOND, ONTARIO

DURATION OCTOBER 1989 to FEBRUARY 1990

PARTICIPANTS

1. Members of the S.E.R.Team will participate either actively or as control subjects in the program of N.I.S.V. Members of the S.E.R.Team are selected from among volunteer, regular members of the R.C.M.Police. Potential candidates are chosen through a series of physical and, psychological tests, technical and suitability interviews. Candidates are then chosen to participate in a 9 day "Selection Process". Having successfully completed the 9 day Selection Process a candidate may be selected to receive 3 months of S.E.R.T, Induction Training.

2. Approximately 7% of the volunteers for S.E.R.T. duty are selected. Average police service is 12 years, average age is 33 years. A member remains with the S.E.R.T. Program approximately 3 years before returning to other police duties.

3. For operational reasons (which will not be discussed here) S.E.R.T. is divided into 2 mirror image teams based on such factors as individual skills and experience. These teams will form the "control" and "test" groups of N.I.S.V. All members participating in the N.I.S.V. project will participate in the S.E.R.T. Duty Related Tests.

It was not considered possible to select a third group which would have received mock training. Firstly, Sports Vision, the nature of its training, and purported benefits of it, was already known to some of the participating members. Therefore, it would be impossible to device a system of 'placebo' training (without any influence on vision skills) which would have been convincing enough to produce the desired effect.

4. The decision to use the existing team divisions as 'control' and 'test' groups was made to insure an equal division of skill levels, based on the specific duties of the individuals and their experience. On each unit there are equal numbers of 'assaulters' and 'snipers' among their numbers. The weapon of testing, the pistol, is a primary weapon of an assaulter, a secondary weapon of a sniper.

Finally it would have been logistically impossible to conduct this testing with randomly selected groups (because of other duty requirements) and would probably have resulted in a less than equal distribution of abilities.

Hence it is believed that this division will not impact on N.I.S.V. results, since members are purposely placed on the respective teams towards balancing the two. Seven of the participating members have recently been transferred from S.E.R.T. duties after completing a rotational transfer period. However all meet the selection criteria by virtue of having served on S.E.R.T. and are required to maintain the same duty related skills in their new positions.

5. Pretest evaluations are not considered necessary in the true sense since each of the Duty Related tests will measure skills at which participating members have a demonstrated ability, and which are practised regularly.

6.1 SHOOTING

The participant will react to a visual stimulus facing 'shoot, don't shoot' situations combining reaction, recall and shooting skills. Timing will begin with the visual stimulus and stop when the target is 'engaged' (shot). A "don't shoot" situation is simply pass/fail, and involves no timing. The participants decision to shoot is based on the ability to recognize a 'key' photograph which may appear on the target to be engaged. Participant ability is measured in terms of: (i) speed of engagement (ii) correct shooting decisions (iii) accuracy. The participant will be tested on 20 occasions over a 12-14 week period. For each test, all participants will engage the same target situation, using the same 'key' photographs. During the period of testing (20 sessions) subjects will have faced 80 targets. 60 targets (75%) will be engaged as shooting situations, 20 (25%) will be presented as 'don't shoot' situations.

Speed of engaging the targets (shooting situations) is emphasized, however accuracy is recorded for analytical purposes.

6.2 OBSERVATION

Subject is shown a photograph and permitted to study it for 10 seconds. The same photograph will not be shown for tests 1 & 2.

As in test 1, an automatic target system is used in this test which combines observation, recall and reaction skills. The subject stands in front of a target (which is turned away). The target has 4 photographs (see Appendix B), one of which is like that shown to the subject prior to the test.

The subject, using pressure mats situated in numbered sequence around him (see Appendix B), will activate the electric timer and turn the target to face by stepping on the centre pressure mat. Once recognition of the "key" photograph is made, the subject will step on the appropriately numbered mat, stopping the timer.

This test will be performed only once per session, 20 times total. Times will be recorded for all performances and incorrect responses noted.

6.3 SELF DEFENCE

Subject will take a neutral stance in front of a 'heavy bag'. A 'ready' light will appear followed by a directional light which indicates to the participant to go left or right. With this indicator the participant strikes the bag with a kicking blow. Reaction time is measured from indicator light to contact with the bag.

PROTOCOL - TEST 1 (APPENDIX A)

- 1 participant in the testing area at a time.
- procedure will be demonstrated in standard directions read to each participant (see Appendix I).
- participant will be shown a "key" photograph and permitted to study it for 10 seconds.
- a "key" photograph is shown and will appear only once during the study period. Photographs, including 'key' photographs, and order of their appearance were pre-selected randomly.
- photographs used will be identified by number.
- (refer to Appendix A) participant will stand in front of a series of targets in a semi-circular configuration.
- targets may be placed anywhere within this semi-circular configuration, however only targets at positions L1,2,R1,2, a distance of 5 m from the shooter, will be "engaged" as shoot/don't shoot situations.
- the distance and position of the remaining targets will change randomly from test to test to disguise pattern recognition.
- the extreme targets of the series L and R will not be beyond 90° from the centre line (see Appendix A).
- targets to be 'engaged' will be at 45° (targets L2/R2) or 27.5° (targets L1/R1) from the centre line.
- a photograph will be placed over the head area of each target.
- the 'duel-a-tron' automatic target system will be used to mount targets.
- once the participant has indicated his state of readiness (weapon loaded, hammer down, weapon at search position), he will focus on a white light (focus light) which will appear at eye level along the centre line dividing the two target series.

- each target is equipped with a red light situated immediately atop the target base 2' from ground level.

- simultaneously, the focus light will go out, a light will appear at 1 target, and all targets will turn to face the shooter.

- the subject then faces a 'shoot, don't shoot' situation reacting to the target where the light is on. If the photo appearing on the target is that of the individual shown to him previously, he will not shoot. A target with any other photograph will be engaged (shot). Speed of 'engaging' the target is emphasized here.

- an electronic timing device is automatically started when the focus light is extinguished and is stopped when the participant engages the target. All targets immediately turn away from the shooter allowing no opportunity to view other photographs in the 'don't shoot' situation, the monitor will manually operate this control.

- the shooter will return his focus to the 'focus' light, and the next situation is presented. Returning to the focus light will negate the advantage/disadvantage of anticipation by the subject (shooter).

- all 'shoot, don't shoot' situations and targets to be engaged have been randomly selected. All subjects are read the same instructions by the evaluator on the first day of testing, (see Appendix I), and will face the same 'shoot, don't shoot' situations. For a don't shoot situation the participant will be instructed to fire a round in a safe direction to disguise the sequence to those waiting to participate.

- all target engagement will be to the centre of mass.

- timed scores taken to the nearest .001 second.

- recording of times as per Appendix A.

- accuracy - shots plotted as per Appendix E.

EQUIPMENT

1. Issue Sig Sauer P226 9 mm pistol and ammunition.

2. RCMP silhouette targets.

3. Duel-a-tron target system.

4. Electronic timing equipment/light system.

5. Full Face Photographs - (106).

6. Indoor Range facilities, lighting at a constant.

7. S.E.R.T. uniform/range equipment (goggles, body armour, etc.).

NOTE:

It is impossible to guarantee participation by all 'control' and 'test' group members on scheduled testing days, due to factors such as duty commitments, annual leave, illness, etc., which are beyond the control of the monitors. All members participating will receive the same situations, however they may not be administered in the same order.

PROTOCOL TEST 2 (APPENDIX B)

- participant will be shown a 'key' photograph and permitted to study it for 10 seconds.
- a 'key' photograph is shown only once during the testing period.
- 1 target situated directly in front of participant (duel-a-tron system) at 5 m. line.
- 4 face photos attached (as per Appendix B), one of which is the 'key'.
- target turned away from participant.
- photos are numbered clockwise 1 - 4.
- participant is surrounded by pressure activated mats with numbers corresponding to targets (see Appendix B).
- subject starts timer and activates target to "face" by stepping onto the pressure plate.
- when the 'key' photo is recognized the subject steps to the corresponding pressure mat, stopping the timer.
- electronic timing (to .001 sec.) is started and stopped by applying pressure to the appropriate mat.
- incorrect responses to be recorded by the testing monitor.
- 1 situation per session (20 total) to be administered.

EQUIPMENT

- articles 2-7 as presented in Test 1.
- pressure activated devices.

NOTE:

It is impossible to guarantee participation by all 'control' and 'test' group members on scheduled testing days, due to factors such as duty commitments, annual leave, illness, etc., which are beyond the control of the monitors. All members participating will receive the same 'situations', however, they may not be administered in the same order.

This does not apply to Test #3 since the situation is presented randomly on each occasion to each participant.

PROTOCOL TEST 3 (APPENDIX C)

- see overview.

- lapsed time from signal to contact with the bag. Four attempts will be made during each session. Randomly selected, left or right. 80 attempts will be made during the testing period. Kicking blow to be delivered as instructed. (usual 'THAI' Round Kick from the front 2.5-3 ft high with the shin to the upper thigh area).

  The kicking technique used is monitored by a qualified instructor, who will disallow improper technique which allows for a speed advantage. In such cases the test will be repeated.

EQUIPMENT

- heavy bag.

- electronic equipment as required.

PROTOCOL TEST 4
NON DUTY RELATED TEST

VOLLEYBALL

Procedure - participant and control groups as selected will participate in weekly volleyball games.

EVALUATION - not required.

SCORING/RECORDING - outcome of all games played will be appropriately recorded. Subjective determination of improvement in hand/eye coordination, through analysis of point totals and victories over time, by each group.

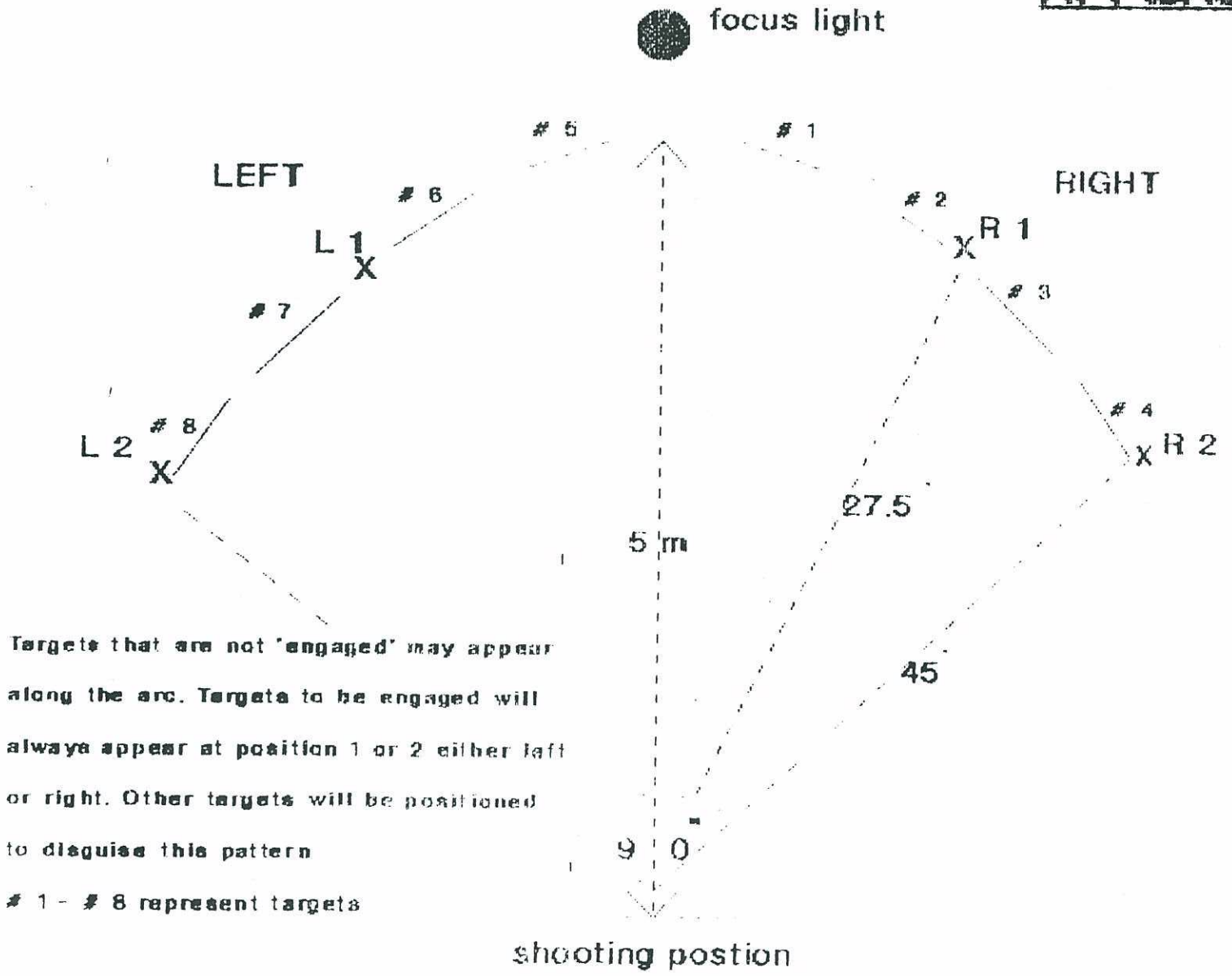
EQUIPMENT - standard volleyball equipment, court, etc.

MONITORS

Seven monitors of NISV training and SERT verification tests were selected from among non-operational members of the SERT and the Dwyer Hill Training Centre. Each as been instructed with the proper use and administration of NISV training and are familiar with the requirements of the SERT tests.

Monitors will carry out their responsibilities in an irregularly scheduled format because of other duty responsibilities. Each monitor will be responsible for administering both NISV training and SERT testing.

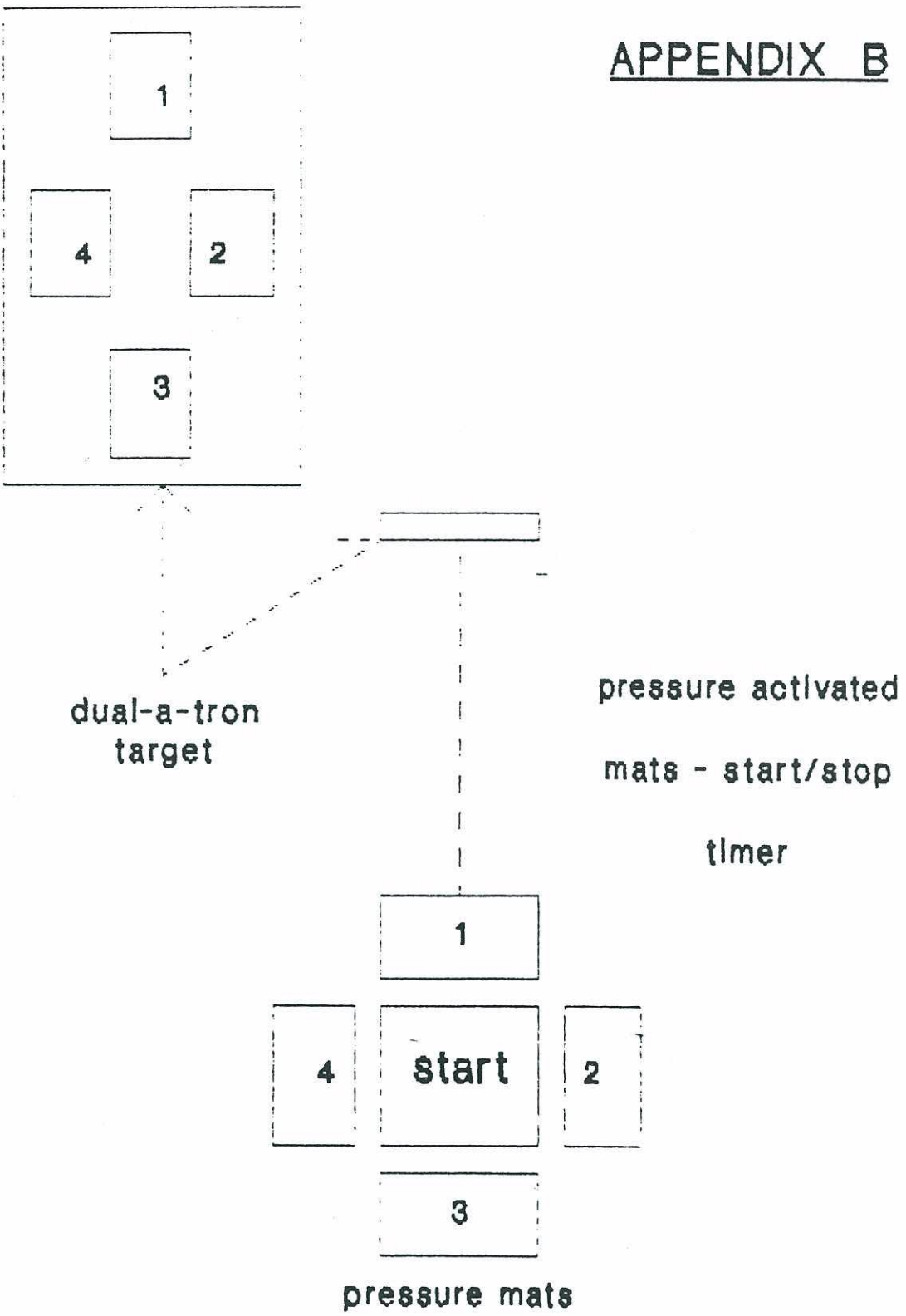
APPENDIX A



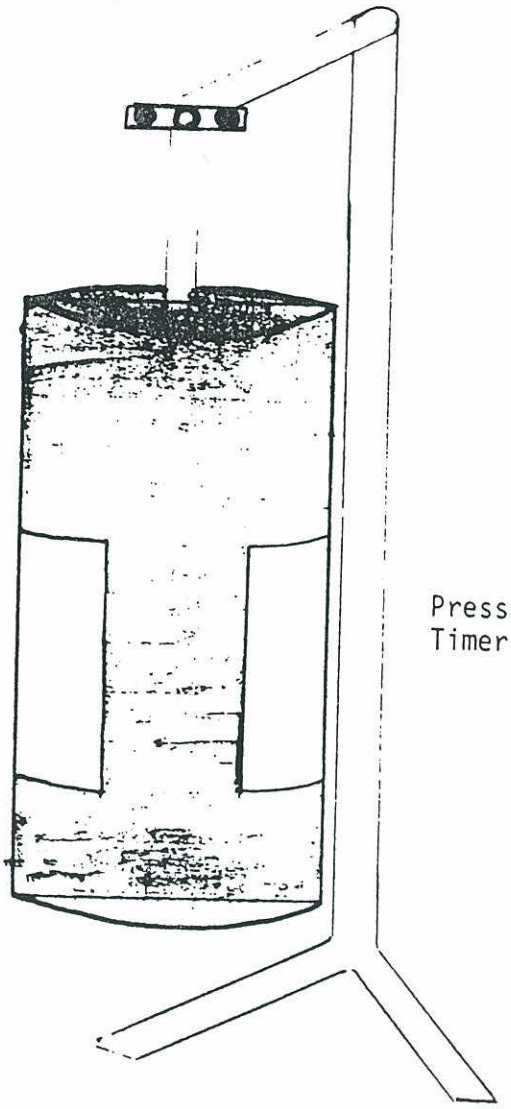
Targets that are not 'engaged' may appear along the arc. Targets to be engaged will always appear at position 1 or 2 either left or right. Other targets will be positioned to disguise this pattern

1 - # 8 represent targets

APPENDIX B


1
4
2
3
dual-a-tron
target
pressure activated
mats - start/stop
timer
1
4
start
2
3
pressure mats

APPENDIX C


Indicates Left
'Ready' Light
Indicates Right
Pressure Pads
Timer stops on contact

TEST	1	2	3	4	5	6	7	8	9	10
L TIME	1/2 ---	1/2 ---	1/2 ---	1/2 ---	1/2 ---	1/2 ---	1/2 ---	1/2 ---	1/2 ---	1/2 ---
2 L TIME	1/2 ---	1/2 ---	1/2 ---	1/2 ---	1/2 ---	1/2 ---	1/2 ---	1/2 ---	1/2 ---	1/2 ---
3 L TIME	1/2 ---	1/2 ---	1/2 ---	1/2 ---	1/2 ---	1/2 ---	1/2 ---	1/2 ---	1/2 ---	1/2 ---
4 L TIME	1/2 ---	1/2 ---	1/2 ---	1/2 ---	1/2 ---	1/2 ---	1/2 ---	1/2 ---	1/2 ---	1/2 ---
1 R TIME	1/2 ---	1/2 ---	1/2 ---	1/2 ---	1/2 ---	1/2 ---	1/2 ---	1/2 ---	1/2 ---	1/2 ---
2 R TIME	1/2 ---	1/2 ---	1/2 ---	1/2 ---	1/2 ---	1/2 ---	1/2 ---	1/2 ---	1/2 ---	1/2 ---
3 R TIME	1/2 ---	1/2 ---	1/2 ---	1/2 ---	1/2 ---	1/2 ---	1/2 ---	1/2 ---	1/2 ---	1/2 ---
4 R TIME	1/2 ---	1/2 ---	1/2 ---	1/2 ---	1/2 ---	1/2 ---	1/2 ---	1/2 ---	1/2 ---	1/2 ---
L	12CW	12CW	12CW	12CW	12CW	12CW	12CW	12CW	12CW	12CW
R	12CW	12CW	12CW	12CW	12CW	12CW	12CW	12CW	12CW	12CW
L	12CW	12CW	12CW	12CW	12CW	12CW	12CW	12CW	12CW	12CW
2 R	12CW	12CW	12CW	12CW	12CW	12CW	12CW	12CW	12CW	12CS
L	12CW	12CW	12CW	12CW	12CW	12CW	12CW	12CW	12CW	12CW
3 R	12CW	12CW	12CW	12CW	12CW	12CW	12CW	12CW	12CW	12CW
L	12CW	12CW	12CW	12CW	12CW	12CW	12CW	12CW	12CW	12CW
4 R	12CW	12CW	12CW	12CW	12CW	12CW	12CW	12CW	12CW	12CS

i.e.

C = Correct
W = Wrong

2 L	1 / 2	
TIME	1.012	

2nd situation in daily sequence
shooting situation at target
L1, time 1.012

4	L	1 2 C W
	R	(1) 2 C W

4th situation in daily sequence
'don't shoot' target R.1,
correct decision made

PART 1

TEST/VERIFICATION
APPENDIX D

TEST	11	12	13	14	15	16	17	18	19	20
1 L TIME	/2 --	1/2 ---	1/2 ---	1/2 ---	1/2 ---	1/2 ---	1/2 ---	1/2 ---	1/2 ---	1/2 ---
2 L TIME	1/2 ---	1/2 ---	1/2 ---	1/2 ---	1/2 ---	1/2 ---	1/2 ---	1/2 ---	1/2 ---	1/2 ---
3 L TIME	1/2 ---	1/2 ---	1/2 ---	1/2 ---	1/2 ---	1/2 ---	1/2 ---	1/2 ---	1/2 ---	1/2 ---
4 L TIME	1/2 ---	1/2 ---	1/2 ---	1/2 ---	1/2 ---	1/2 ---	1/2 ---	1/2 ---	1/2 ---	1/2 ---
1 R TIME	1/2 ---	1/2 ---	1/2 ---	1/2 ---	1/2 ---	1/2 ---	1/2 ---	1/2 ---	1/2 ---	1/2 ---
2 R TIME	1/2 ---	1/2 ---	1/2 ---	1/2 ---	1/2 ---	1/2 ---	1/2 ---	1/2 ---	1/2 ---	1/2 ---
3 R TIME	1/2 ---	1/2 ---	1/2 ---	1/2 ---	1/2 ---	1/2 ---	1/2 ---	1/2 ---	1/2 ---	1/2 ---
4 R TIME	/2 --	1/2 ---	1/2 ---	1/2 ---	1/2 ---	1/2 ---	1/2 ---	1/2 ---	1/2 ---	1/2 ---
1 L	12CW	12CW	12CW	12CW	12CW	12CW	12CW	12CW	12CW	12CW
1 R	12CW	12CW	12CW	12CW	12CW	12CW	12CW	12CW	12CW	12CW
2 L	12CW	12CW	12CW	12CW	12CW	12CW	12CW	12CW	12CW	12CW
2 R	12CW	12CW	12CW	12CW	12CW	12CW	12CW	12CW	12CW	12CS
3 L	12CW	12CW	12CW	12CW	12CW	12CW	12CW	12CW	12CW	12CW
3 R	12CW	12CW	12CW	12CW	12CW	12CW	12CW	12CW	12CW	12CW
4 L	12CW	12CW	12CW	12CW	12CW	12CW	12CW	12CW	12CW	12CW
4 R	12CW	12CW	12CW	12CW	12CW	12CW	12CW	12CW	12CW	12CS

ACCURACY LOCATION OF SHOT

EXAMPLE OF RANKING POINT SYSTEM

SCENARIO #3

$$\frac{(1-\frac{\text{Time}}{4})}{\text{Time}} \times \text{Score} - (\text{Errors} \times 20) = \text{RP}$$

Average Speed = 1.230
Accuracy Points = 34
Ranking Points =

$$\frac{(1-\frac{1.230}{4})}{1.230} \times 34 - (0) = 19.07$$

ACCURACY SCORING SYSTEM

X or 10 Ring = 10 Points
9 Ring = 9 Points
8 Ring = 5 Points
7 Ring = 3 Points
6 Ring = 1 Point
Target Miss or
Decision Error = 0 Points

PART 2 APPENDIX E

	1		2		3		4		5		6		7		8		9		10	
	R	C	R	C	R	C	R	C	R	C	R	C	R	C	R	C	R	C	R	C
TARGET	12 34	12 34	12 34	12 34	12 34	12 34	12 34	12 34	12 34	12 34	12 34	12 34	12 34	12 34	12 34	12 34	12 34	12 34	12 34	12 34
TIME																				

	1		12		13		14		15		16		17		18		19		20	
	R	C	R	C	R	C	R	C	R	C	R	C	R	C	R	C	R	C	R	C
TARGET	12 34	12 34	12 34	12 34	12 34	12 34	12 34	12 34	12 34	12 34	12 34	12 34	12 34	12 34	12 34	12 34	12 34	12 34	12 34	12 34
TIME																				

R = required
C = chosen

	R		C	
TARGET	1 3	2 4	1 3	2 4
TIME	1.012			

R	C
1 2 3 4	1 2 3 4
1.012	

#4 selected before the correct decision

TEST	1	2	3	4	5	6	7	8	9	10
1 R TIME										
1 L TIME										
2 R TIME										
2 L TIME										

TEST	11	12	13	14	15	16	17	18	19	20
1 R TIME										
1 L TIME										
2 R TIME										
2 L TIME										

1 R TIME	1.012

Situation 1 to the right

TEST	1	2	3	4	5	6	7	8	9	10
1										
2										
3										
4										
5										
6										
7										
8										
9										
10										
TOT										

GAMES PLAYED

TEST	11	12	13	14	15	16	17	18	19	20
1										
2										
3										
4										
5										
6										
7										
8										
9										
10										
TOT										

	TEST 'BLUE'	CONTROL 'GOLD'
1.	D5	D1
2.	D6	D2
3.	D7	D3
4.	C9	D4
5.	A13	C10
6.	A16	S14
7.	A17	S15
8.	S19	A18
9.	S22	A20
10.	A26	A21
11.	A31	A23
12.	A32	S24
13.	A33	S27
14.	A34	A28
15.	A35	A29
16.	S38	A30
17.	S39	A36
18.	A42	S40
19.	A43	S41
20	S44	A45
21.	A46	A47
22.	A48	C51

INSTRUCTION TO PARTICIPANTS

GENERAL

The validity of this testing, and your personal performance in comparison to other participants will be adversely influenced if the situations become known by those who will follow you. Do not discuss the situations or sequences with persons who have not completed the days activities.

Your scores/times will not be revealed to you until the conclusion of the testing period.

PART I

You will be shown a photograph and permitted to study it for 10 seconds.

You will then walk to the shooting line; load a magazine with 4 rounds; chamber the 1st round, and decock the weapon.

Hold weapon in the search position.

The decision to use either a one or two handed style is yours, however you must remain consistent in that choice throughout the study period.

Focus your attention on the white light which is at eye level, between the left and right series of targets. When this light is extinguished, a red light atop the base of one of the targets will come on, and all targets will turn to face you. If the photograph appearing on the target is the same person as the one you studied, you WILL NOT engage it.

If the target photograph IS NOT the same person as previously shown, you WILL engage the target with one shot to the centre of mass.

Decock your weapon; return attention to white light; return weapon to search position and prepare for the next situation.

If you encounter a "don't shoot" situation, the monitor will instruct you to fire a round in a safe direction, not striking any of the targets.

Following your fourth situation, holster your weapon and proceed to Part II.

PART II

You will be shown a photograph and permitted to study it for 10 seconds.

Facing the duel-a-tron target, stand astride of the large pressure mat.

You will activate the duel-a-tron target by bringing your feet together on the pressure mat.

The target will turn and you will see 4 numbered photographs displayed in a clockwise pattern.

One of these photographs will be that of the person which you just studied.

When you identify it, immediately step on the corresponding numbered pad.

You have now finished Parts I & II. DO NOT discuss the sequences or photographs you have seen with participants who have not yet completed the day's testing.

PART III

Stand in a neutral position, with weight equally distributed, at arms length distance in front of the heavy bag which will allow you to strike the bag with a round kick.

On the bag stand are 3 lights displayed at eye level (white light flanked by 2 green lights). The white light will be your indication to get ready. Within 5 seconds one of the green lights will come on. You must strike the bag with a kicking blow to the side which corresponds to the illuminated green light.

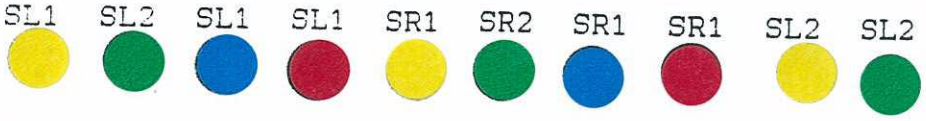
Return to the neutral position and turn your attention again to the white indicator light.

The selection of lights is made randomly by the timing device, therefore you must not anticipate a movement left or right.

This exercise will be repeated 4 times.

PART 1 PROGRAM - TARGET APPENDIX J

	TEST	1	2	3	4	5	6	7	8	9	10
O	1	SL2	SL1	SL1	SR2	SL2	DL1	SR1	SL2	SR2	SL2
R											
D	2	SL1	SL1	DR2	SL1	DL1	DL1	SL1	DL2	SL2	DR2
E											
R	3	SR1	SR1	DL2	SR2	SL1	SL1	SR2	SL2	SL2	SR1
	4	SL1	SL2	SL1	SL1	SR1	SR2	SR1	SR1	SL2	SL2



S - SHOOT

D - DON'T SHOOT

L/R - LEFT OR RIGHT

1/2 - TARGET 1 or 2

PART 1 PROGRAM - KEY PHOTOGRAPHS

test	1	2	3	4	5	6	7	8	9	10
'key' photo	82	33	95	11	94	66	12	96	43	13

1.
2.
3.
4.
5.
6.
7.
8.

Photograph posisions (1-8) not filled by a 'key' photograph, are randomly selected. The number of the photograph is recorded, so that the 'situation' can be reproduced.

PART 2 PROGRAM - KEY PHOTOGRAPHS - POSITION

test	1	2	3	4	5	6	7	8	9	10
1.		74					4		57	
2.					76					40
3.						87		65		
4.	70		52	75						

PART 1 PROGRAM - TARGET APPENDIX J

	TEST	11	12	13	14	15	16	17	18	19	20
ORDER	1	SL2	SR1	SR1	SR1	SL1	SR2	DR2	DR1	SL1	SR2
	2	SR2	SL2	DR1	DR2	SR1	SR2	DL2	DR1	DL2	SR1
	3	SR2	SR2	SR2	SR1	SL1	SR2	DL1	SL2	SL2	SL1
	4	SL1	DR1	SR2	DL2	DL1	SR2	SR1	DR1	SL2	DR2

S - SHOOT

D - DON'T SHOOT

L/R - LEFT OR RIGHT

1/2 - TARGET 1 or 2

PART 1 PROGRAM - KEY PHOTOGRAPHS

test	11	12	13	14	15	16	17	18	19	20
'key' photo	37	64	97	101	99	06	103	90	78	18

1.
2.
3.
4.
5.
6.
7.
8.

Photograph posisions (1-8) not filled by a 'key' photograph, are randomly selected. The number of the photograph is recorded, so that the 'situation' can be reproduced.

PART 2 PROGRAM - KEY PHOTOGRAPHS - POSITION

test	11	12	13	14	15	16	17	18	19	20
1.			10							104
2.	49				46				15	
3.		14				56	20			
4.				79				09		

RESULTS

1. Vision training provided by the National Institute for Sports Vision Inc. (N.I.S.V.) and the S.E.R.T. verification testing has been completed as per the work action plan. This report will serve to explain the test results and observations which rise from them.

2. It had been hypothesized that measurable improvement in duty related skills could be observed in members having been exposed to N.I.S.V. training, by virtue of the fact that their ability to gather visual information and initiate a physical response would be increased.

3. The testing protocol called for 3 duty related tests and one non-duty related test to be administered regularly and coincidentally with N.I.S.V. training. Unit 1 of S.E.R.T. was randomly selected (coin flip) as the 'test' group (blue) receiving N.I.S.V. training. Unit 2 (gold) received no training but participated in the same verification testing. The results of these duty related tests by the N.I.S.V. trained group would then be compared against those of the untrained group.

4. Schedules for the N.I.S.V. training and S.E.R.T. testing were followed as well as could be expected given the known impeding variables of annual leave, conflicting duty requirements, illness, injury, etc. Certainly these factors affected the scientific purity of the experiment, but this is not considered crucial to the validity of the results, since the regularity of the training and verification tests were subjected to the same variables as could be expected within a normal training routine. Indeed, results from a more clinically pure experiment would be less applicable to the circumstances which interest us here.

5. Results by the test group (blue) in N.I.S.V. training will be the subject of a separate report submitted by that organization. Soon to be completed will be an evaluation of the untrained 'gold' group which will be compared with the pre-training evaluation of the 'blue' group to confirm that the two competed equally in terms of their vision skills.

6. During November and December, 1989 N.I.S.V. training was administered by S.E.R.T. personnel. At this time, training was a systematic progression of more complex tasks programmed by N.I.S.V. All test group participants proceeded at the same rate. In January 1990 N.I.S.V. assumed the responsibility of the training; tailoring programs for each of the individuals involved. This allowed individuals with lesser or greater skills than the group in general to progress at their own rate.

7. Personnel

Gold (control) group - 23 members participated to a total of 299 scenario days - 1196 situations - average 52 situations each. (PART I & II)

Blue (test) group - 21 members participated to a total of 283 scenario days - 1132 situations - average 54 situations each. (PART I & II)

NOTE: R. Fraser, a unit 1 member would have participated as a member of the test group except that he arrived on transfer too late to receive the same N.I.S.V. exposure as other members. His scores then were maintained as a member of the control group which did not receive the training.

8. Notes to Graphs

All scenarios have been plotted even though there is an obvious period of adjustment to the procedures. Scores on all accounts rose dramatically after scenario day 1.

The test group, which had already begun N.I.S.V. training (approx. 1 month) appears to have adjusted to the procedures quicker than did the control group. After scenario day one, the scores recorded were relatively compatible until patterns developed in the test groups dominance.

All graphs have been plotted using scenarios as opposed to occasions since not everyone participated on the same days. This allows us to use all 20 scenarios and shows results when each participant was given the same conditions.

Each scenario should be assessed individually when comparing the results of the two groups as the degree of difficulty varied from scenario to scenario and was not progressive in nature.

The degree of difficulty in this testing is best understood when considering the photographs that were used as 'keys' to the testing.

Photographs - black and white.
caucasian males.
ages approx. 28-48.
full facial photos only.
short hair (regimental length).
prevalence of mustaches, otherwise clean shaven.
all photographs were of members of the R.C.M.P.

9. Test 1 - Duty Related Skill - Shooting

The procedures followed in this test are outlined on Page 3 and associated appendices in the protocol.

Test 1 - Measured

1. time from initiation to target engagement.
2. accuracy of bullet strike.
*3. ranking score.
4. decision errors.

*Ranking score is determined by combining the time of engagement with accuracy of bullet strike and factoring in any decision errors into the following formula:

$$\frac{[(1 - \frac{\text{Time}}{4}) \times \text{Score}] - (\text{Errors} \times 20)}{\text{Time}} = R$$

Accuracy was determined by simply scoring the target. A "possible" score for any given testing day being 40 (4 situations) 'Non-shooting' situations correctly judged were scored 10 points. Decision errors, in effect engaging the wrong target, were severely penalized in the ranking system.

Appendix A shows 4 graphs which represent the cumulative average scores by each group for Test 1 in terms of Speed of Engagement, Accuracy, Decision Errors and Ranking.

10. Speed

This graph indicates that both groups took longer to adapt to the situation format then had been anticipated. Although the skills used are practised regularly, the added variable of actually identifying a target obviously added to the difficulty and stress of the situations.

The control group (gold) progressed faster in terms of speed and up to scenario day 5, had established a dominance.

The test group (blue) progressed at a more gradual rate but by scenario day 5 were establishing equality with the control group. From day 8 to the conclusion the test group reacted faster on 10 of 13 occasions but more importantly had established consistency in performance which was not attained by the control group. After day 5, times for the blue group varied only .15 sec while the gold (control) group varied in times to .23.

The consistency in speed of engagement is important since each

scenario presented was different and obviously of varying degrees of difficulty. (Note: the varying degree of difficulty is clearly reflected by the corresponding peaks and valleys by both groups in the accuracy and ranking point graphs.)

11. Accuracy

Each of the 2 groups performed comparably in terms of accuracy up to scenario day 5. At that point, the test group began to establish a dominance over the control group. After scenario day 12 the control group did not shoot more accurately than the test group on any occasion.

As noted above, the corresponding peaks and valleys by each group reflect the degree of difficulty of the situations.

12. Decision Errors

Decision errors were scored as a failure to shoot when required, or when a shot was taken when inappropriate to do so. This critical aspect of the test resulted in severe penalization in ranking, when inappropriate responses were made. Target misses were also calculated as errors.

Test group (blue) - 26 errors (3 of which were target misses).
Control group (gold) - 46 errors (8 of which were target misses).

13. Ranking Points

This combines the elapsed time of engagement with the accuracy scores in the formula explained previously. This scoring formula, where the three factors are combined, again shows a dominance of the test group after week 8 of the training.

14. Part II

See p.8 of the protocol for details of the administration of this test.

Since N.I.S.V. training focuses on eye/hand co-ordination this test was designed to isolate, to the degree possible, the decision making process and not the physical movement itself. In this test, a foot movement was required to start and stop the timing device. Since none of the training received is designed to increase foot speed or eye/foot co-ordination it was assumed that both groups would be relatively homogeneous in these areas throughout the testing period. Differences in this test could then be attributed to decision making speed.

In this test, as with Part I, the test group seemed to start at a higher level than the control group. After a brief period the control group equalled and even surpassed the test group until scenario day 10, when the test group began to dominate. Scenario 10 being the point where individual training began. From this point to the end of the testing, the blue (test) group was superior on 8 of 11 occasions. (On 2 of the 3 occasions where gold scored higher the difference was negligible).

15. Part III

See p.10 of the protocol for details of the administration of this test.

This test involved a simple left or right decision by the participant who would react with a THAI kick to the target. This test was administered by the unit's self defence instructor as insurance that the appropriate style was used to 'kick' the target. Unfortunately this test was not administered often enough to be considered significant. However the statistics that were gathered are interesting, in that, once again the 'blue' test group started faster than the control group, but at no point did the scores of the control group equal those of the test group.

16. Part IV

The non-duty related test of group volleyball had been included in the testing protocol as a matter of interest, where subjective assessments of skill improvement, based on games won and points scored, were to be made. It was found to be logistically impossible to conduct this testing without further impacting on duty training schedules. Since this test was not critical to the verification of the N.I.S.V. training, it was dropped from the protocol.

17. Conclusion

These tests were designed to verify the hypothesis that visual skills enhanced through N.I.S.V. training could be translated into improved job performance. The validity of these tests in judging the possibility of that transference was supported by Drs. Gordon SQUIRES and Ray STEIN, ophthalmologists, of the Ontario Eye Safety Committee.

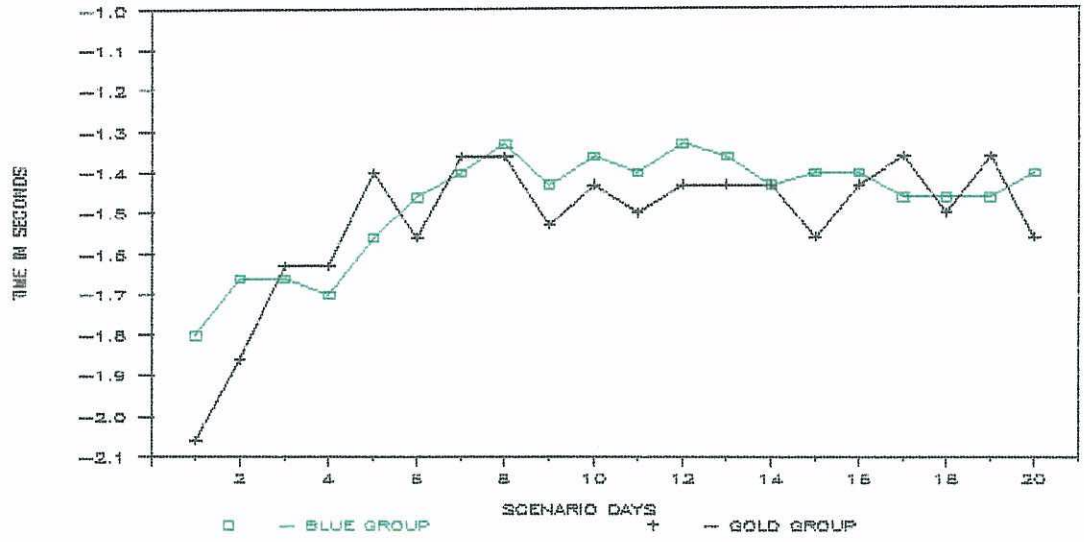
The tests were not conducted in a purely clinical scientific sense. Again, this would not seem to detract from the validity of results since the N.I.S.V. training and the verification testing were conducted under the influence of variables ever present in the S.E.R.T. training program.

It would have been preferable to conduct the training and testing over a longer period of time in order to draw more clear conclusions about individual progress by the participants. However enough data has been collected to see the development of clear patterns.

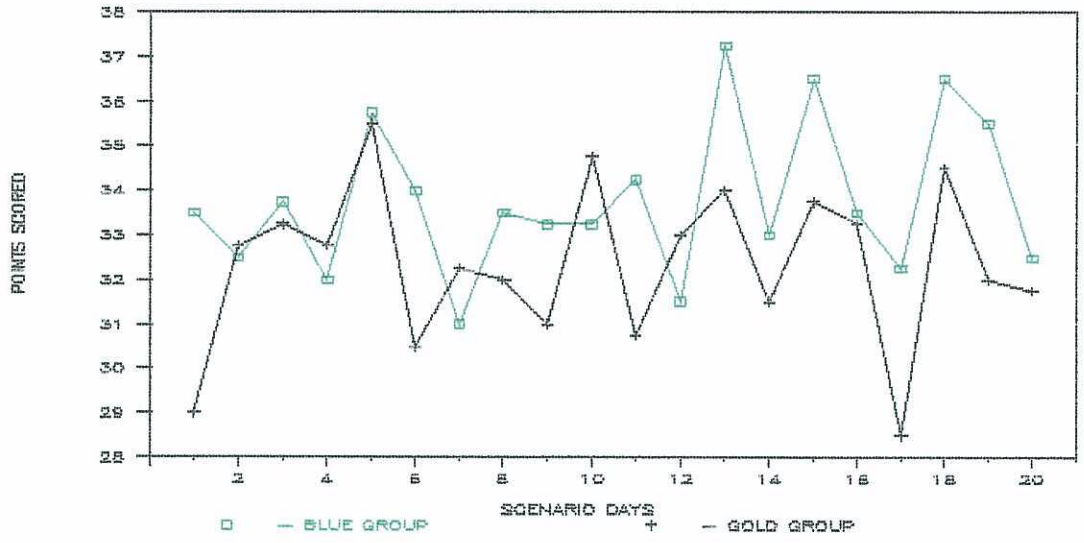
The relative homogeneity of the 2 groups tested seems to be confirmed in that there were few significant differences in the scoring patterns up to scenario day 5. (The only exception here is in the speeds recorded in test 1 where the control group appeared to be faster and that the group receiving vision training adapted quicker to the new procedures.) After the fifth testing session the 'test' group began to show a dominance in all areas of testing, and after the 10th session, when individualized N.I.S.V. training began, these differences began to be accentuated.

If the tested groups are assumed to have been equal in physical skill before the testing commenced, it must be assumed that the vision training received by the test group is responsible for their superior performance by the end of the test period.

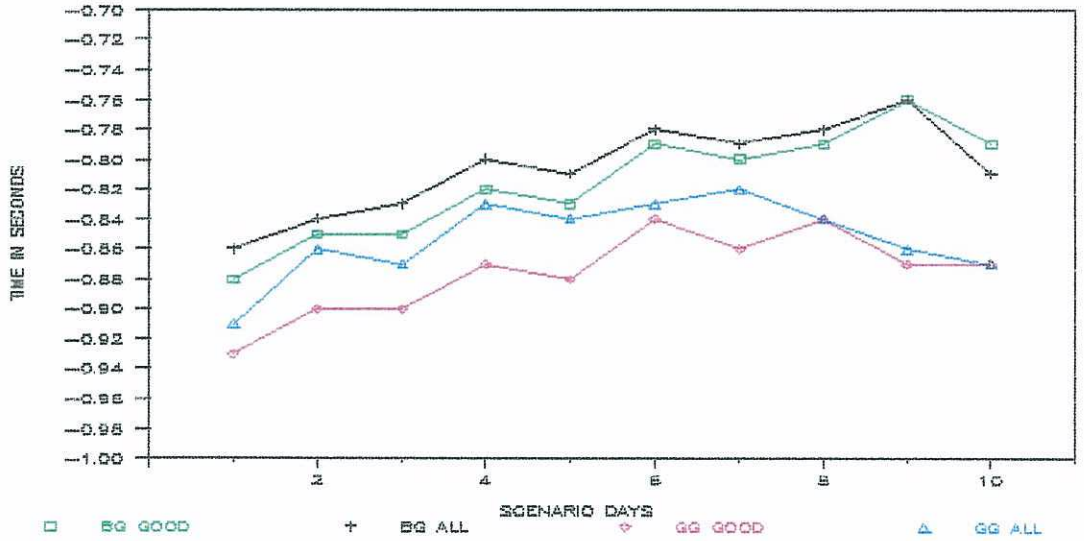
DUTY RELATED SPEED



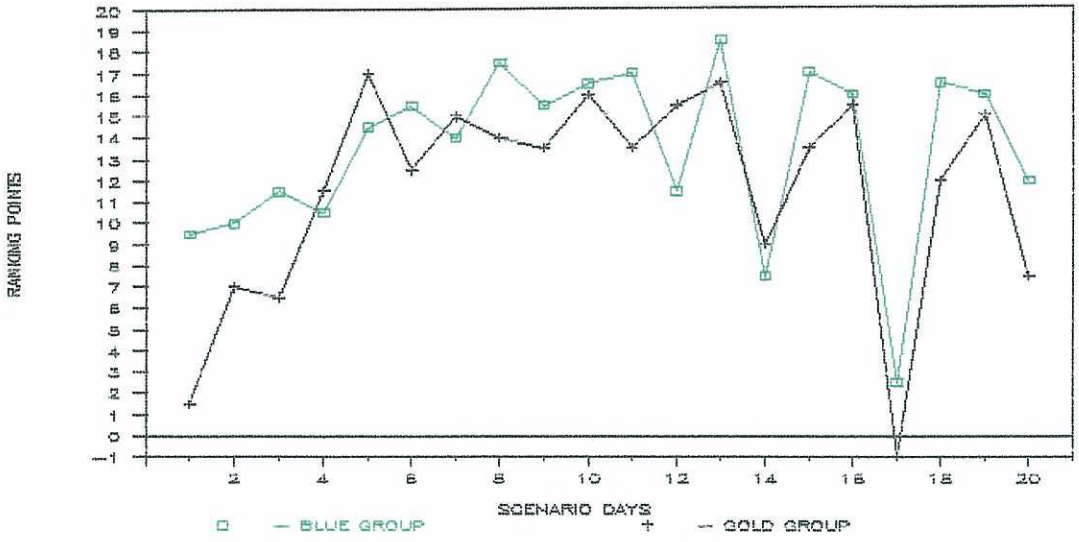
DUTY RELATED ACCURACY



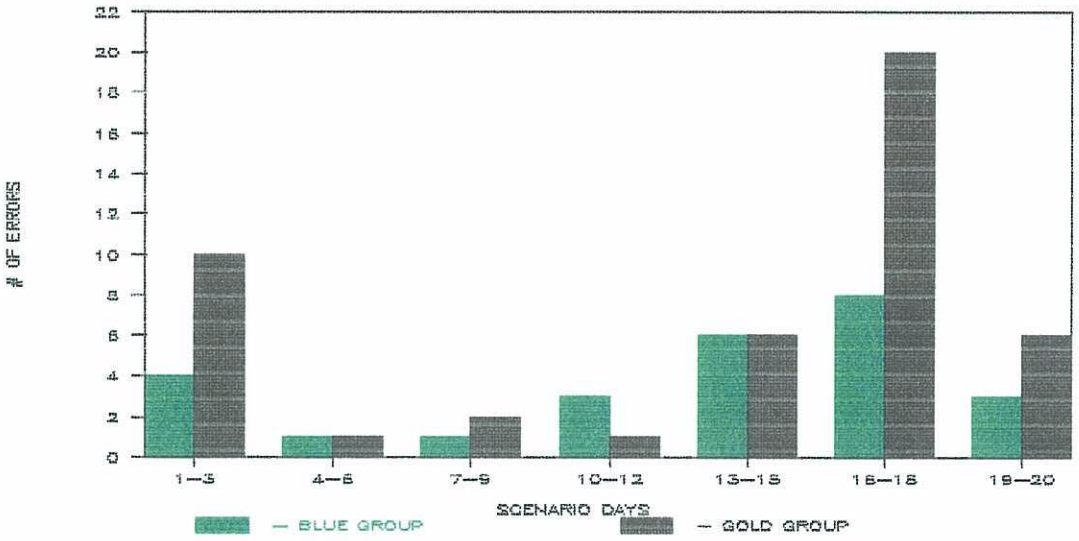
DUTY RELATED SELF DEFENSE



DUTY RELATED RANKING POINTS



DUTY RELATED DECISION ERRORS



DUTY RELATED OBSERVATION