AUSTRALIAN
WAR MEMORIAL

Series number: AWM279
Control symbol: 2/18
DPI: 300

This item is provided for private research purposes only. If you desire to use this material for publication or any other purpose you may only do so with the permission of the copyright holder.

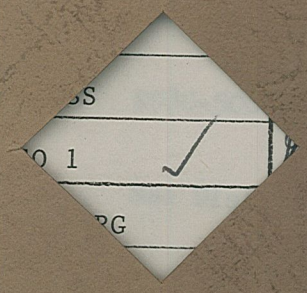
Scan date: 21/12/16

Printed on acid free paper

RESTRICTED

The information given in this document is not to be communicated directly or indirectly to the Press or to any person not authorized to receive it.

FORS 48



(BRANCH/DIRECTORATE)

WORKING PAPERS







NOTE:

All official correspondence must be attached to the Central Registry file.

The inside front cover of the Central Registry file must bear reference to the existence and normal location of these papers.

RESTRICTED

NOT A REGISTRY FILE

SUBJECT: Anzus 279

5287

THESE PAPERS ARE USUALLY HELD BY

..... (Appointment)

AND ARE TO BE RETURNED TO HIM ON COMPLETION OF ACTION.

BRANCH/DIRECTORATE REF:

AHQ FILE: / / REFERS

PRIOR REFERENCES

Ref. No.	Subject of reference

SUBSEQUENT REFERENCES

Ref. No.	Subject of reference

REVIEW OF SECURITY CLASSIFICATION

Date of review	Result of review	Signature of reviewing officer

Result of review is to be entered as either: a. NO CHANGE,
b. UPGRADED TO _____ or,
c. DOWNGRADED TO _____

When a change in security classification occurs the papers contained in this cover are to be appropriately amended, together with the original cover, and placed in a new cover of the fresh classification.

7530 — 66 — 031 — 1896

ASS

INTERNAL CIRCULATION

SASS		Mr WICKS	
D/SASS		Maj ADAMS ✓	On/s.
GSO 1 ✓	11/5	Maj HITCH ✓	14/5
OC AAORG		Maj SMITH	
Dr RAYMOND		Maj WUST	
Mr HENDERSON		Dr TALONI	
Mr KENNETT		GSO 2 ✓	
Mr MILLANE		WO I ABBOTT	
Mr HEANEY		TECH INFO	

Requests:

RETURN TO G2 ASAP

Upon completion to ADC Directorate.
as at 11/5/71.

G2: Copy to EP, Engrs, INF

Done ↑

R980-500-01 of 28 Feb 71

RESTRICTED

- 4 MAY 1971

SAMB	
D/SAMB	
OIC AAORG	
GSO 1	
GSO 2	

Headquarters
Australian Force
(Army Component)
VIETNAM

R980-500-91

28 Apr 71

See Distribution List

SINGLEPOINT SMALL ARMS WEAPON SIGHT

Reference: A. AFV R980-500-91 dated 22 Jan 71.

B. 1 ATF R980-500-128 dated 8 Feb 71 (to AFV only).

1. Reference A called for reports on operational experiences gained by members of 1 SAS Sqn with the Singlepoint Small Arms Weapon Sight.

2. The report submitted (Reference B), although not entirely satisfactory, confirmed the usefulness of the sight in 'snap shooting' situations.

3. The changeover of SAS Squadrons in mid - February prevented discussions with other than two members of 1 SAS Sqn to amplify the comments contained in the report.

4. At Annex A to this paper are summarised the opinions obtained.

5. Whilst only a small body of opinion has been canvassed, it is apparent that the Singlepoint is popular with certain Australian troops who have purchased them privately. It is proposed that monitoring of the US in-theatre evaluations continue.

J R Gardner

(J. R. GARDNER)
Captain
for Commander Australian Force
VIETNAM

Distribution:

AHQ (C) - 2 (for ASS)

Topographic Forstech
Correspondence Feb 903-2 Pt 12

For Information:

OSD/ARPA RDFU-V - 2 (Attn Cdr D. Agnew)
USARV - ACTIV - 2

RESTRICTED

ANNEX A TO
HQ AFV R980-500-91
DATED 28 APR 71

SOME COMMENTS ON SAS USAGE OF THE SINGLEPOINT SIGHT

1. The sight is available in two configurations, the 'Sporting' and the 'Military'. Both have been used by 1 SAS Sqn since May 1970, with up to 10 members owning their own sight.

2. With the sights fitted to the Rifle, 5.56 mm, M16 and the Rifle, 7.62 mm, L1A1, no problems were encountered in zeroing the sight. Users claimed a ½ inch grouping at 25 metre range could be achieved in the lying supported position.

3. The problem of bringing the spot of light onto the target quickly involved up to two days of learning and practice in the technique, but with claimed increases in speed of reaction of up to 50%, it is felt that this period is not excessive.

4. Static and moving targets have been engaged using the Singlepoint, with lighting conditions varying between total darkness, and daytime under single and double jungle canopy. Fleeting targets have not been engaged using the sight. Target ranges have generally been less than 50 metres.

5. The sight has proved itself to be quite durable, but cases of condensation appearing on the inside of the sight were experienced during the wet season.

6. It is claimed that the beam of light does not compromise the firer's position when used at night.

7. The main features of the Singlepoint sight which made it so popular were the speed with which fire could be brought onto a target, and the obvious advantage of a field of view of 180° afforded by the use of both eyes in using the sight.

Copy fwd to EP on 12 May 71

Evening Standard 9

25 Feb 71

file 903-2-2

The Singlepoint Sight

By Major F. W. A. Hobart (retd)

THE first rifled muzzle loader was the Baker introduced into the British Army in 1800. In its day it was not considered an outstandingly accurate weapon and in no way a great step forward in that respect from its predecessors. The Baker was fitted with an elongated bead foresight and the backsight was a U. If we look at today's British Army Rifle we find almost exactly the same arrangement except that the backsight is now a complete circle instead of only part of one. How is it that in this age of advanced technology and new materials, of inventors following each other with bewildering rapidity, the British Army has made so little progress in improving its sighting system in the last 170 years?

To answer this we should take a look at sights and see how they have developed. Firstly what is a sight for? It is to enable the firer to line up his barrel on the target and to check that alignment at the moment the shot is fired. The sight will incorporate an adjustment to allow the line of sight and the trajectory of the bullet to intercept at the target at all ranges except direct point blank, and many sights will permit allowance to be made for a cross wind.

Sights are generally grouped as "iron sights" "optical sights" and "telescopic sights". Iron sights are either open or aperture sights.

The earliest form of military sight was a small bead foresight with no backsight and this was common in most countries. A notched backsight was added later to produce the open sight as we know it; this produced a considerable improvement because the firer had simply to turn his V backsight into a W by putting his foresight blade in the centre of the V, level with the shoulders, with the target perched on top. The foresight was put as far forward as possible and the backsight as far back as the firer could see it clearly; and here came the difficulty. It is not possible for the eye to focus on the backsight—perhaps 15 inches away, a foresight say 28 inches away and a target at 400 yards. Although the human eye is extremely accommodating, particularly with the young, it cannot focus on three so widely separated objects at the same time. The worse the light conditions the greater the difficulty. Also on a bright day the eye does not get a clear picture of the back sight and the top surface is seen as a nebulous hazy line. Raising the backsight to line up a firm image with the top of the foresight depresses the muzzle and the shots go low. Thus the saying, "Lights up, sights up". In general, open sights are not as popular on military weapons as they were, although it should be noted that the Russian, Chinese, Czech and almost all satellite countries still use them.

The substitution of an aperture for the rear V helps because the eye will automatically find the centre of the aperture and so has to concentrate only on the foresight blade and the target. Even this however is almost impossible, and the eye constantly leaps from the foresight to the target and back again in a series of rapid movements imposing in this way the picture of the foresight over the target impression to make a composite image on the retina. It may well be that with experience the eye develops a 'memory' of the target image which is held and the foresight is placed over this by movement of the muzzle.

This system of iron sights is the simplest there is. It gives an acceptable degree of accuracy under good conditions, but under adverse conditions and when a quick aim is required it is not good enough.

An optical system (which is not necessarily magnifying) will bring the target to the focal point where it can coincide with a graticule. Thus the eye focusses on one point only which it is well able to do and the lens system produces a lot of light even under the worst conditions of daylight viewing.

For night viewing it is astonishing how much light is available to be gathered up by the lens system and concentrated at the focal plane. Unfortunately although optical sights, with or without a measure of magnification, are extremely good, they are also expensive to make and cannot be issued to all front-line troops. There have been various other types of devices to line up a tube on a target and amongst them is the collimator. The idea of the collimator has been known for many years and this system has been used before, but the latest method of employing the principle is embodied in the Singlepoint sight.

The Singlepoint sight is essentially a simple device. The light source is located at the forward end of a tube and near it is a thin diaphragm. In the diaphragm is a pin hole. Light passes through the pin hole and passes down the tube. It enters a lens and is rendered parallel to the axis tube. If the eye is placed centrally behind the sight, a small spot is perceived which the relaxed eye assumes to originate at infinity. This is illustrated below. A two element lens is used to eliminate chromite and spherical aberration.

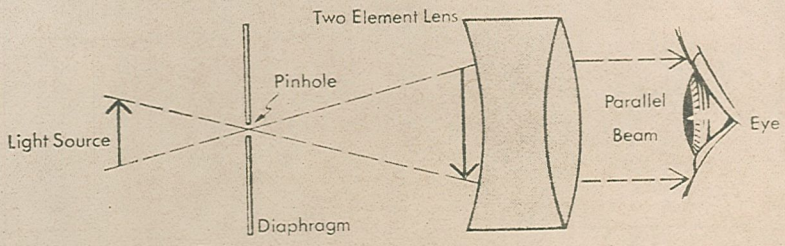


Fig 1. The Optical Principles of the Singlepoint Sight.

The output from each eye is passed *via* the optical nerve to the brain. If one eye sees the target and the other sees the source of light which it considers to originate at infinity, then the normal process of binocular vision produces at the brain the impression of the light source superimposed over the object, at infinity.

The Singlepoint sight does just this. The principle was recognised and defined by a Swede, Mr. Nils Ruder, who produced the earliest model and covered his invention with the necessary patents. The firm of Singlepoint (Great Britain) took over the manufacturing rights and Mr. Ruder came on to the Board of Directors.

The earliest Singlepoint sight used a small battery and a bulb to provide the light source but there are obvious military reasons why a battery powered light source is not acceptable. The next stage was to take away the battery and bulb and use a polychromatic acryllic plastic which responded to ultra violet light and became fluorescent, producing a red light which the lens system directed into the firer's eye. This model, although very successful, was a daylight sight only. The next stage was to develop a source that would enable the weapon on which it was mounted to be used as long as a target could be seen with the naked eye. The selected source was a Beta light. This is a glass cylinder filled with tritium gas which is a low level radio-active electron emitter. The electrons impinge on a phosphor which emits a green light and is perfectly safe to use. In fact it provides less hazard than a luminous dial wrist-watch. It has a half life of 12¼ years so will outlast the equipment on which it is mounted. The Beta light is manufactured and marketed by Saunders Roe Ltd.

Before describing the trials carried out to evaluate the sight, another few words on using the Singlepoint would be in order. The firer needs to have two eyes (it is not a successful sight for a man who has monocular vision), and he must look at the target. He then raises the weapon, and, as the butt comes to



Fig 2. The Firer's Sight Picture.

his cheek, his eye lines up with the sight. When this happens he sees a green spot. All he now has to do is to continue to keep both eyes open and move his weapon until that green spot appears on the target. The firer can now engage and, provided he has previously lined up the line of sight with the axis of the bore, he will achieve a surprisingly high incidence of hits. At the moment there is no arrangement for applying Tangent Elevation (TE). If it were considered necessary to do so a simple rocking bar sight going from 50 to 300 metres could put the front of the sight down by an angle equivalent to the TE so that bringing the sight up on to the target would elevate the bore.

However this is an appropriate moment to say that the sight gives the best results under quick action conditions against combat type targets. It is *not* suitable for the steady deliberate conditions prevalent at Bisley unless used by a firer possessing a great deal more experience than that of the average soldier.

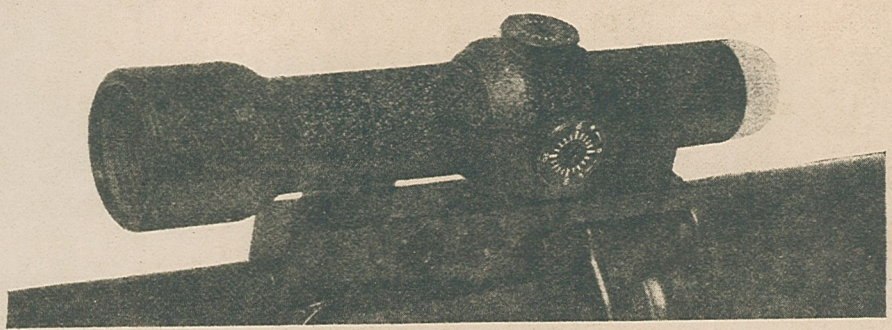


Fig 3. The Singlepoint Sight.

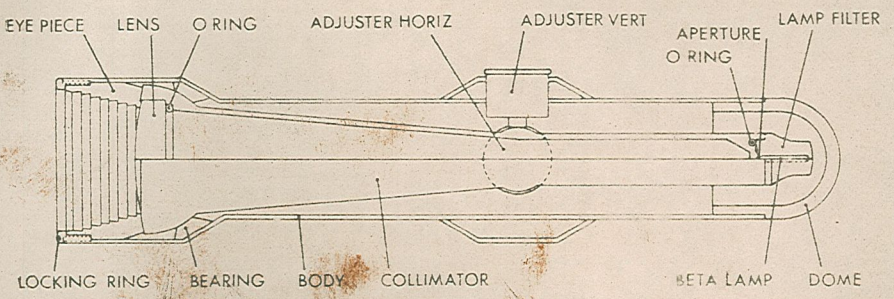


Fig 4. Diagram of Singlepoint.

If the sight is held in position for any length of time the spot starts to drift. With me it moved slowly up towards one o'clock. As soon as I appreciated this was happening and concentrated, the spot moved back.

Calibration of the sight is not difficult. The most successful method is to fire the weapon from the standing position and adjust the sight relative to the *mpi* of the group fired. The zeroing process is very simple and requires only a coin. At a pinch the rim of a round will suffice. There are two screws which move the collimator in planes at right angles to each other, inside the shell. The elevation adjustment is on the top. The lateral adjustment on the right. There is a clicking system and one click corresponds to 2.5 cm per 100 metres. When the adjustment is completed a five round group should be fired to check the zeroing of the sight.

It is possible of course to fix the weapon, align the bore on to an aiming mark and then adjust the Singlepoint on to the same point of aim. This is useful when silence is essential.

Evaluation Trials

The process of rousing interest in this country in a new idea can take a lot of time, and official bodies have a lot of inertia which, by definition, tends to resist change. Thus the earliest trials of this sight were carried out by interested units such as the SAS, the Para Bns and some Infantry Bns. Other tests were carried out at the Royal Military College of Science. A short description of these trials follows.

Firstly it was appreciated that this sight was designed for quick shooting under active service conditions and so it was subjected to tests where speed of engagement was a principal parameter. The following weapons were used:

Sub-machine gun	L2A3 Sterling	9 mm
Rifle	L1A1	7.62 mm
	AR-15	5.56 mm
GPMG	L7A2	7.62 mm

It was considered that the sub-machine gun and rifle were the most suitable weapons for this sight and most of the effort was put into this although the results of the GPMG trial were also interesting.

Sub-machine Gun. The sight was mounted on the standard British 9 mm L2A3 SMG the Sterling. It was desired to find out whether the chance of a first round hit was significantly different using the standard iron sights or using the Singlepoint. Twenty firers in turn fired, each using the iron sight and the Singlepoint. Each man fired one round at each of eight No. 11 targets placed 24, 50, 75, 100, 125, 150, 175 and 200 yards from the firing point. The targets could be engaged for 5 seconds only and varied in location from 45 degrees left or right at close range to ten degrees left or right at 200 metres. There was no set arrangements for the targets to be engaged. For example, the first target could be on the left of the range at 100 metres and the second on the right at


L1A1
L 2A3
Hythe
Night
Sight
GPMG
Silenced Stirling
AR 15 .223 mm Rifle
Heckler and Koch
7.62 mm Rifle

Fig 5.

25 metres, the third in the centre at 200 metres and so on until all eight targets had been engaged. The order for each man was decided purely at random. The firer stood with the butt of the S.M.G. in his shoulder, muzzle pointed down.

Using this system we had 20 engagements at each of eight ranges (a) with iron sights and (b) with Singlepoint. Thus it was possible to work out the chance of a hit at each range using each sight. These results showed that at 25 yards there was a 100% chance of a hit with both sights but that as the range increased the Singlepoint showed a significantly better result until at 200 yards the difference was about 10% in its favour.

From this it can be seen that the chance of a first round hit is significantly better with the Singlepoint sight.

A great deal of interest has been evinced in the Singlepoint sight mounted on the silenced Sterling L34A1 S.M.G. The weapon is shown on Fig 5 opposite page 58. It seemed to everyone who used this equipment that here was the ideal combination of a sight enabling quick and accurate shooting with a weapon that made no more sound than the noise of the bolt crushing up the case. For clandestine operations this had many attractions.

Later the night firing trial will be described and here the silenced weapon came into its own. With no flash and little noise the observers posted to the flanks of the range found it not only impossible to detect the firer but were sometimes in doubt, when the wind was blowing, whether the weapon had been fired at all.

Rifle. The first trial was carried out with the German Heckler and Koch G3 rifle. This is the standard German service rifle firing the 7.62 x 51 mm NATO cartridge and operated by the delayed blow back system.

Here the trial was conducted in the same manner as for the sub-machine gun but the 10 firers were allowed to engage in any fashion they chose, either standing kneeling or lying. The target was exposed for 10 seconds.

In this trial there were fifty hits with the iron sight and seventy-two with the Singlepoint.

Trials have also been carried out with the AR-15 .223 mm rifle. In this case it was found that the sight must be 9-12 inches from the firer's eye.

GPMG. The British General Purpose machine gun, the L7A2 was fired next. Four fixed targets at 200, 300, 400 and 600 yards were set up. These were numbered 1, 2, 3 and 4 and the firer was called on to engage the declared target with a five round burst. The time was not controlled. The trial was carried out twice with each type of sight. It became apparent very early on that the Singlepoint enabled the firer to engage and switch targets much more quickly than the conventional aperture sight but it was equally evident that the sight needed to be mounted on a rocking bar to get the required tangent elevation for the range. The procedure adopted here was to zero at 400 yards which produced high results at 200 and 300 metres and low at 600 metres.

From the results it was apparent that the Singlepoint sight is best used on a sub-machine gun or a rifle. With both of these it produced excellent results when quick aim was taken, but the margin of superiority was not obvious over conventional sights for deliberate fire.

Night Firing

The manufacturers claim that this is the best simple night sight there is. Whilst agreeing that an expensive image intensifier is the best known night sight yet produced, they argue that there is no comparable sight, either optical or iron, at a comparable price for night firing. Others argue that optical possibilities exist at a comparable cost.

The weapon chosen for the night firing trials was the L1A1 rifle fired with the British Army Trilux, or Hythe, night sight and the Singlepoint sight. The Trilux sight consists of a broad foresight with a Tritium insert. The rear sight

is a larger aperture of .28in diameter. The sight is used in the conventional way, *ie* the foresight is centred through the backsight and placed on the target.

A private trial was conducted on the author's behalf and five Fig 7 targets were placed out at 100 metres spread over 100 metre frontage. The night chosen was a good test of any sighting system with no moon and about 50% cloud. After a few minutes to enable the firers to get accustomed to the darkness, it was found that the targets could just be seen with the naked eye as a series of dark patches out in front. The targets were numbered from left to right and the number of the target to be engaged was called out. The firers used single shot only and fired only one round at each target. The next target was called up and engaged. This procedure was repeated until 20 shots had been fired. Five firers were used, each repeating the trial once with the Hythe night sight and once with the Singlepoint. The sight was not tested over a prolonged period of darkness.

The result was Singlepoint 40 hits, iron sight 21. There was no doubt that the Singlepoint was the more successful sight. This was partly due to the fact that it was so difficult to see the targets with the naked eye that interposing a set of iron sights partly blocked out the target and using only one eye was not a help. With the Singlepoint sight there appeared to be no obscuration as the rifle came up.

Official Trials

The sight was also tested at Netheravon. The rifle results were not very good but the Singlepoint had a distinct advantage on the SMG for engagement at night and for rapid engagement. The sight was recommended for jungle type fighting.

It is one of the tasks of the Jungle Warfare School to evaluate weapons and accessories which have particular application to that type of combat. On 26 January to 6 February 1970 a trial of the Singlepoint sight was conducted. The aim of the trial was declared to be "to compare the effectiveness of the Singlepoint sight mounted on in-service weapons with the effectiveness of the normal sight for those weapons; particular emphasis being given to fleeting targets in the jungle environment".

The weapons used were mainly the SLR and the SMG although firings were carried out using the GPMG. The firers were ten from 40 Commando RM and ten from 1 Royal New Zealand Infantry Regiment.

There is insufficient space to go into a great deal of detail but the essence of the trial was the engagement of targets under genuine jungle warfare conditions where targets appeared for fleeting moments at unexpected places. The number of hits was recorded, the time taken to engage was noted, and the ratio of shots fired to hits obtained, was determined.

Before the trial commenced the soldiers available were split up into two squads—'conventional' and 'Singlepoint'. The two squads were given equal training time and fired equal numbers of training rounds.

After the trial was completed the conclusions from results could be summarized as:

a. Singlepoint scored 10% more hits at all ranges up to 400 metres.

b. At night the Singlepoint produced considerably better results than the Hythe night sight, at least double the number of hits being scored with all weapons. With the GPMG the scoring rate was more than four times greater for Singlepoint firers.

The trial report produced the recommendation that "The results obtained, particularly by night, were sufficiently encouraging for a future troop trial to be recommended with greater numbers involved".

Perhaps further trials will be conducted.

If the Singlepoint sight were adopted it would be a departure in British military practice where, since the earliest flintlock musket, Brown Bess, adopted in 1690, the Army has used iron sights. Perhaps after nearly 300 years a change is due.

Copy also in Fors Tech Correspondence File

FORS Tech Corres 903-2 Pt 12 Folio 8 ~~A3~~ 8

RESTRICTED

- 2 FEB 1971

SAMS
D/SAMB
OIC AAORC
GSO 1
GSO 2

Headquarters
Australian Force
(Army Component)
VIETNAM

R980-500-91

22 Jan 71

See Distribution List

SINGLEPOINT SMALL ARMS WEAPON SIGHT

References: A. AFV SD 01341 dated 23 Jan 70.

B. AHQ EP 3902 dated 28 Jan 70.

C. AFV FORS 022613 dated 24 Dec 70.

1. Reference A advised AHQ that two sights had been left with Field Operational Research Section (FORS) by the Marketing Director of the Singlepoint Company for an in-country evaluation. FORS suggested that the Special Air Services Squadron (SAS) would be the best trial unit, as they had shown interest and were prepared to use the item operationally.

2. AHQ (EP) advised that a formal SAS trial in Vietnam was not considered warranted in view of the evaluation of an earlier model sight in Australia.

Watch this
The previous "trial" was highly contaminated & also results open to question.

3. Subsequent discussions between D Eqpt and GSO2 (FORS) in Feb 70 resulted in a recommendation that an evaluation be conducted by SAS and 6 RAR. Subsequent problems prevented an evaluation being undertaken. However, it is understood that certain members of the SAS Sqn have privately purchased Singlepoint sights and that these are being used on operations.

4. Following another visit to Vietnam, the Singlepoint Marketing Director was able to supply sights for an evaluation by US Army Concept Team in Vietnam (ACTIV), and Office of the Secretary of Defense Advanced Research Project Agency Research and Development Field Unit Vietnam (OSD/ARPA RDFU-V).

5. As an adjunct to the US evaluation, reports from users of the sight are requested to be forwarded to HQ AFV through the normal SD channels, and these are to be forwarded to AHQ (EP) and AHQ (ASS) for information as advised by Reference C. The reports would not be formal, but a suggested format is outlined at Annex A.

(J. R. SALMON)
Colonel
Chief of Staff

Annexes: A. Suggested Format of Informal Report.

Distribution:

1 ATF (4) (Includes two copies for 1 SAS Sqn)

For Information:

AHQ (EP)
AHQ (Eqpt)
AHQ (ASS)

Internal:

GSO2 (SD & Trg)
FORS

ANNEX A
TO AFV R980-500-91
DATED 12 JAN 71

SUGGESTED FORMAT OF INFORMAL REPORT

It is hoped that comments are made on as many of the following topics as possible, with qualifications where necessary. (Users are to be encouraged to give their own opinions freely as it is realised that the reports can only express subjective assessments of the various aspects of this sight):

a. type of sight (Red or Green spot);

b. period of usage of sight;

c. frequency of usage;

d. type of weapon used;

e. zeroing sight;

f. re-learning aiming techniques;

g. types of target engaged (static, moving, fleeting);

h. ease of aiming compared with conventional sight (for each target type);

i. increase in accuracy (for each target type);

   (1) increase in firing rate (manual and semi-auto weapons);

   (2) control of burst (auto weapons);

j. effect of various lighting conditions on effectiveness of sight;

k. durability and robustness;

l. other advantages/disadvantages; and

m. any other comments.

Single Point Wpn Sight

48

RESTRICTED

RESTRICTED

OPEN

AUSTRALIAN WAR MEMORIAL
ACCESS STATUS

00519350A

Item control

Australian War Memorial