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REGULATIONS
FOR
ARMY ORDNANCE SERVICES
PART II

PAMPHLET No. 12

Notified in Army Orders for November, 1933

1933

**INSTRUCTIONS FOR THE
EXAMINATION AND PROOF OF
PYROTECHNIC STORES**

(This edition supersedes the edition issued with Army Order 21 of 1929, together with all published amendments thereto)

**REPRINTED WITH ALL AMENDMENTS PROMUL-
GATED UP TO JULY, 1941**

By Command of the Army Council,



THE WAR OFFICE,
August, 1941.

Printed under the Authority of HIS MAJESTY'S STATIONERY OFFICE
by William Clowes & Sons, Ltd., London and Beccles.

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REGULATIONS FOR ARMY ORDNANCE SERVICES

PART II

PAMPHLET No. 12

EXAMINATION AND PROOF OF PYROTECHNIC STORES

SECTION I

GENERAL INSTRUCTIONS

A. EXAMINATION

1.—(1) Stores of all natures will be subject to inspection annually.

(2) At the annual inspection, five per cent. of all packages, hermetically sealed tinned-plate cylinders, or boxes and "exposed" stores will be visually examined as a guide to the probable general condition of the remainder of the stock on charge.

Note.—"Exposed" stores are stores contained in tinned-plate cylinders and/or boxes which are not hermetically sealed stores issued in papier mâché cylinders or boxes and loose stores.

(3) Should any defect (*e.g.* damp or rust) be found to be of common occurrence at this examination, a further five per cent. examination will be made.

2. Poor external appearance of the stores or their packages, or any other relevant detail such as bad packing, unsatisfactory material or chemical action must be brought to notice in the report of inspection.

B. PROOF

3. All stores will be proved by nature, Mark, filler, Lot and date of filling (*i.e.* month and year), separately, except in the case of "grouped" stores (*see* para. 11).

I.O.Os. will be responsible for the selection of stores for proof in accordance with the instructions given in this pamphlet and in R.A.O.S., Part II, Pamphlet No. 11.

4. Normally two per cent. of stores over three years old (from date of filling) will be selected annually for first proof. Any exceptions to this rate will be found in the instructions relating to each store.

Stores less than three years old will be proved if in doubtful condition.

5. Where for any reason a departure is made from the percentages laid down for proof, the reason must be stated in the report of inspection.

6. Where *special instructions* have been ordered (*i.e.* inspection in circumstances not ordinarily required by these regulations), the normal percentages for proof will apply unless otherwise ordered.

7.—(1) When stores of a particular nature, Mark, filler, Lot and date of filling, are held on charge at more than one station in the area over which an I.O.O.'s jurisdiction extends, a summary of all portions of the Lot will be made for purposes of the annual proof, and samples will be taken from as many portions of the Lot as the required proof percentage will admit.

(2) When, however, for any reason the I.O.O. considers that a separate proof from a particular portion of the Lot is desirable, he will exercise his discretion in the matter, giving reasons in the report of inspection.

8. When some portions of a Lot or group are in hermetically sealed cylinders or boxes and other portions are "exposed," they will be bracketed together on the Army Forms for recording purposes, *but samples for first proof will in all cases be selected from the "exposed" stores.*

9.—(1) Provided the total quantity of the Lot or group justifies it, stores for proof will normally be selected by whole cylinders or boxes. Where practicable, several packages should be opened in order to obtain the required number of cylinders or boxes, *but the same package must not be opened at successive inspections.*

(2) If, however, the quantity on charge is small, whilst the percentage laid down will be adhered to, the retention of only partially filled cylinders, etc., should be avoided as far as possible; hence every endeavour will be made by "grouping" (*see para. 11*) to use up the whole contents of a cylinder or box when opened for proof.

(3) *Sealed cylinders and boxes will not on any account be opened unless the contents are actually required for proof or current use.*

10. Stores selected for proof must be thoroughly examined in detail before proof is carried out and defects, if any, reported on the Army Forms.

C. GROUPING

11. When the quantity of a particular nature of store held on charge consists of small Lots of various Marks, fillers and dates of filling, economy in the numbers taken for proof will be effected by "grouping" together several of the Lots. Unless otherwise specified in Sec. II the following rules will apply:—

- (a) *When stores are being grouped it is of the utmost importance that all the Lots should have the same "filler."*
- (b) The dates of filling of the different Lots grouped together should not, as a rule, cover a period of more than twelve months.
- (c) Normally a group should include only stores of one particular Mark, but, where the Lots are all of the same filler and closely allied in date of filling, more than one Mark of store may be included, *provided that there are no radical differences of design and that the proof requirements are the same throughout.*
- (d) 200 is normally a suitable number for a group.

D. INSTRUCTIONS FOR SENTENCING

12. All first proofs must be shown on the Army Forms in black ink, second and subsequent proof in red ink.

13. **Individual Lots.**—Unless special instructions for sentencing are laid down, the following normal method will apply:—

If a single failure occurs at first proof, a second proof of the same number as at first proof will be taken.

If more than one failure occurs at first proof or any failure at second proof, the Lot will be sentenced "unserviceable."

14. Grouped Stores.

- (a) The number selected for first proof from a group of stores will all be taken from one particular Lot in the group; if proof is successful, the whole of the group will be sentenced "serviceable."
- (b) If, however, the proof (including reproof where indicated) is a failure, *the Lot in which the failures actually occurred* will be sentenced "unserviceable" and discarded from the group.
- (c) The residual group thus formed will then be treated on its merits and proof taken as at (a) and (b) above, and so forth.

This process of elimination by regrouping is designed to prevent the rejection of potentially serviceable Lots in a group owing to the failure of an isolated Lot. It is essential,

therefore, that the I.O.O. should exercise his judgment and discretion, particularly where Lots vary considerably in quantity, quality and age, by selecting that Lot which is the oldest or shows most signs of deterioration, preference being given to the smaller Lots, for the first proofs.

15. In the case of proof of a group containing "various" Lots, or where for any reason the full particulars of a Lot cannot be ascertained, the *actual markings* found on the stores proved will be entered on the appropriate Army Form.

E. REPACKING ; PAINTING AND MARKING OF PACKAGES

16. **Repacking.**—All tinned-plate cylinders and boxes containing stores opened for examination and/or proof, if their contents have not been entirely expended, and any opened boxes or cylinders containing stores for return to R.A.O.C. will be reclosed by a tape band shellacked on.

After reclosing, the label on the lid of the package will be marked in the space provided for this purpose with the number of stores remaining in the package, and the date of reclosing.

The labels, after affixing and marking, where necessary, will be varnished over with shellac varnish.

17. **Painting.**—Should it be found necessary to repaint and relabel cylinders or boxes, such packages must first be scraped and cleaned so as to furnish a good surface for the paint.

18. **Marking.**—When stores are transferred from one package to another, all markings which appear on the original package will be repeated on the fresh package.

F. DISPOSAL OF UNSERVICEABLE STORES

19. Stores sentenced "unserviceable" on results of examination and/or proof will not be disposed of, nor replaced by serviceable stores (*except in the case of emergency*), until after receipt of confirmation of sentences.

In the interim, condemned stores will be kept apart from serviceable stores in order to avoid any subsequent confusion.

20.—(1) When sentences are confirmed, replacement of the unserviceable stores (if replacement is necessary) will be effected as early as possible, and finally the unserviceable

stores will be disposed of, with the exceptions given below, as follows :—

- (a) By firing.
 - (b) By burning (*see* para. 21 and para. 45 for Generators).
 - (c) By dumping in deep water (*see* para. 22).
- (2) Exceptions to the above are :—
- (a) Tubes will be burnt out by firing as for proof and subsequently boiled out and packed in boxes labelled "Certified free from explosives," as instructed in R.A.O.S., Part II, Pamphlet No. 5.
 - (b) Cartridges, sig. illuminating will not be fired.
 - (c) Rockets and Thunderflashes will not be burnt.

21. Destruction by burning.—Where destruction by burning is directed, the operation will be carried out in the following manner :—

A fire will be made in a brazier or suitable receptacle and a screen of steel or iron plate thick enough for the purpose, and suitably supported, will be interposed between the fire and the operator. The stores to be destroyed will then be dropped over the screen, one by one, by means of tongs or a similar implement, into the fire. *Care must be taken that the operator is completely protected by the screen.*

22. Destruction by dumping in deep water.—Where unserviceable stores are to be disposed of by dropping them into deep water, they must be suitably packed in a weighted package provided with holes to allow ingress of water; the position selected for dumping should be such that there is very little probability of the stores being dredged up, washed up by the tide or otherwise recovered.

G. WARNING TO BE GIVEN WHEN FIRING PYROTECHNIC STORES NEAR THE COAST

24. In order to obviate the night proof of signal cartridges, rockets, grenades and similar stores, being mistaken for distress signals, prior notice of such proof will be given to coastguard stations and lifeboat stations.

A list of addresses and telephone numbers of these stations in Great Britain and Northern Ireland is published in A.C.Is. from time to time.

SECTION II

PROOF PROCEDURE

A. CANDLES, SMOKE, GROUND, MK. II
(TYPE " S.1 ")

See " Generators, Smoke ", para. 42.

B. CARTRIDGES, SIGNAL AND ILLUMINATING

25. Examination.—Special attention will be paid to the following :—

- (a) Discoloration or corrosion of the brass.
- (b) The presence of mildew, damp or other deterioration on the body of the case.
- (c) Spontaneous cracks in the brass.

26. Selection for proof.

- (a) One per cent. with a minimum of 10 and a maximum of 50 of each Lot of cartridges in doubtful condition, or over three years old, will be selected for proof.
- (b) Where the number of any Lot is so small that 10 cartridges will (considerably) exceed one per cent., several Lots or dates will be grouped till the percentage represented by 10 cartridges is normal, or nearly so.
- (c) The following will not be grouped together :—
 - (i) Cartridges of different Marks or by different makers.
 - (ii) Cartridges of dates differing by more than three months.
 - (iii) Cartridges which have been held in store at foreign stations for widely differing periods. For example, those held for one month should not be grouped with those held for six months, and those held for two years should not be grouped with those held for three years.

27. Proof.—The requirements at proof are given in the table below. The cartridges should be fired over a clear course.

Description of Cartridge.	Pistol to be used.	Angle of elevation of pistol.	Range of star.	Time of burning of star not less than.	Remarks.
Cartridges, Signal, 1-in.— Green Red Yellow	Pistol Signal No. 1.	Vertical.	—	5 secs.	The star must burn brightly in the air and be the correct colour.
Cartridges, Illuminating, 1 in., J— Dark ignition.	„	About 45°	200 yds.	7 secs.	The star should travel about 50 yds. before the light is visible and then burn with a brilliant white light.

28. Failures.—The following will count as failures at proof :—

Prematures.
Failure of star to light.
Incorrect colour of star.
Short time of burning.
Short range.
Insufficient illumination.
Break-up of stars.
Excessive recoil.
Split case.
Missfires.
Pierced caps.

A premature is defined as an explosion of the star in, or within 20-ft. of, the pistol.

29. Instructions for sentencing.—If 80 per cent. of the selections function satisfactorily at first proof, the Lot or group will be sentenced “serviceable.”

If only between 60 and 80 per cent. of the selections function satisfactorily at first proof, or in doubtful cases, a second proof, 2 per cent., with a minimum of 10 cartridges, will be taken, except that, if a premature occurs, the Lot will be sentenced “unserviceable” without further proof.

If less than 80 per cent. of the selections function satisfactorily at second proof, the Lot will be sentenced "unserviceable."

If less than 60 per cent. of the selections function satisfactorily at first proof, the Lot will be sentenced "unserviceable" without second proof.

29A. Signal or illuminating cartridges put forward by units for special examination after being carried, for six months, in "A" vehicles in shade temperatures of 90° F. and above, or before return to store after being carried in "A" vehicles in such temperatures, will be examined for corroded caps, corroded or split brass bases and split or bulged paper cases. A small firing proof will be carried out and particular attention will be paid to hang-fires.

30. Disposal of unserviceable cartridges.—When unserviceable cartridges are to be destroyed by burning, they will first be broken down. Cartridges will be removed from the package, one at a time, and treated as follows:—

Remove the wad with a copper pricker, shake out the star and the powder, insert the cartridge in the pistol applicable and fire the cap.

The star, powder and case will be destroyed as laid down in para. 21.

C. FLARES, GROUND

39. Selection for proof.—Flares are exempt from proof for two years from date of manufacture only. If in doubtful condition or over two years old 2 per cent. will be selected for proof subject to a maximum of 40 from any one Lot.

40. Proof.—The proof will consist of burning as for Service. The flares must ignite satisfactorily, give good light, and be a clear colour. There must be no excess of smoke, and the flares must give the following minimum times of burning:—

	Type.	Time.
$\frac{1}{2}$ -hour, red		25 min.
3-in. long by 2-in. diameter—		
Green		1 min. 40 secs.
Red		2 "
White		1 " 15 "
Yellow		2 " 15 "
$1\frac{3}{4}$ -in. long by 2-in. diameter—		
Green		1 "
Red		1 " 20 "
White		40 secs.
Yellow		1 min. 30 secs.

Type.					Time.
$1\frac{1}{2}$ -in. long by $1\frac{1}{2}$ -in. diameter—					
Green	...	...	...	...	55 secs.
Red	...	...	...	...	1 min. 5 secs.
White	...	...	...	...	35 secs.
Yellow	...	...	...	...	1 min. 20 secs.

41. Failures.—The following will count as failures at proof :—

- Unsatisfactory ignition.
- Failure to ignite.
- Loss or incorrectness of colour.
- Failure to burn right out.
- Excessive smoke.
- Short time of burning.

D. GENERATORS, SMOKE AND LACHRYMATORY

Generators, Smoke, No. 5.

Generators, Lachrymatory, No. 2.

Candles, Smoke, Ground, Mk. II (Type "S.1") and Nobel pattern.

42. Selection for Proof.—Generators and candles in good condition are exempt from proof for two years from date of manufacture only.

43. Proof.—The generators and candles will be burnt as for Service and must emit a good volume of smoke for the following periods :—

Smoke, No. 5	not less than $5\frac{3}{4}$ min.
Lachrymatory, No. 2	" " " $1\frac{1}{2}$ "
Smoke, Type "S.1"	" " " 1 "

In the case of lachrymatory generators proof will not be carried out within $\frac{1}{2}$ mile up-wind of houses or people.

44. Failures.—The following will count as failures at proof :—

- Unsatisfactory ignition.
- Failure to ignite.
- Bad smoke effect.
- Short time of burning.
- Bursting into flame.

45. Disposal of unserviceable generators, etc.

(a) Of the methods of disposal given in para. 20 *et seq.* :—

- (i) Burning requires special modification in the case of lachrymatory generators and may be undesirable in the case of smoke generators owing to the nuisance so caused. If the latter are

burnt, they should first be partially broken down (*see below*).

- (b) In lieu of burning, candles and generators, smoke, may be buried in a deep pit, the ignition arrangements having first been removed and destroyed.
- (c) In burning generators, lachrymatory, the following method will be used :—

The generator is opened and the striker sticks removed ; it is then broken down by levering up the baffle plate with a spike (the tang of a file is suitable). The filling is shaken out on to a piece of paper and the igniter, striker sticks and vaporizer pellet are put on one side.

The filling is then destroyed by scattering on to a hot fire in the open air. The fire must be very hot so that no lachrymatory vapour escapes unburnt. The igniter, vaporizer pellet, etc., are then destroyed by throwing them one by one on to the fire and the body of the generator decontaminated in the same way.

The operator should wear gloves and stand to windward of the fire. Care should be taken that none of the powdered filling is spilt.

There should be a clear space of 200 yds. downwind.

E. GRENADES, RIFLE, SIGNAL

46. Selection for proof.—Grenades in good condition are exempt from proof for two years from date of manufacture. If in doubtful condition, or over two years old, 3 per cent. will be selected for proof, with a minimum of 3 and a maximum of 24 for any one proof. Up to 300 may be grouped in accordance with para. 11.

Igniters for the Nos. 31, 32, 38 and 51 signal grenades held on separate charge, should also be grouped in accordance with para. 11. The number to be proved will be dependent upon the number of grenades proved and a representative number should be selected from each group. Grenade and igniter proof should be concurrent. If the signal is not ejected from the grenade body, the failure will be ascribed to the igniter. If any one igniter in a group fails at proof, a further proof of 10 igniters from the same group will be carried out and, if 3 fail to function, the group will be sentenced "unserviceable." All such failures of igniters to function will be ignored when groups of grenades are being sentenced.

47. Proof.—Proof will be carried out by night if practicable with Grenades Nos. 32, 38, 43 and 45, and by day for Nos. 31, 42, 48, 51 and 52. For firing grenades selected for proof the Discharger, grenade, rifle, 2½-in. No. 1 is used with Nos. 42, 43, 45, 48 and 52 grenades and Cartridge, S.A., rifle grenade, .303 in., ballistite, H, Mk. Iz. For Nos. 31, 32, 38 and 51 (rodded grenades), Cartridge, S.A., rifle grenade, .303 in., cordite, H, Mk. II. is used.

48. The signals should rise to a height of at least 200 ft., and the parachutes must open and correctly suspend the signals. The times of burning must not be less than the following :—

Nos. 31 and 42 (one smoke candle)—

Blue or purple or yellow	..	..	..	8	secs.
Red	..	..	..	15	„

Nos. 32 and 43 (coloured stars)—

Green, red or yellow in any combination	..	22½	„
---	----	-----	---

Nos. 38 and 45 (one changing-colour star)—

Red to green to red ; white to red to white—

First portion	..	..	..	4	secs.
Second portion	..	..	..	6	„
Third portion	..	..	..	9	„

No. 48 (four flash stars). The four stars should be ignited in turn, each giving a brilliant flash. The delay between ignition of each star should be about 0.5 sec., but must be not more than 0.8 sec. or less than 0.2 sec.

Nos. 51 and 52 (white illuminating stars) .. 8 „

49. The contents are indicated on the grenades and will be noted by the I.O.O. before firing.

A number of signals have been issued as “ No. 43 day or night,” such signals being stencilled in black on the body with the words “ Day or night,” by which they can be distinguished. Such signals should be proved as for No. 52.

50. Failures.—The following will count as failures at proof :—

Blinds.

Signal not ejected from grenade body (attention is drawn to para. 46).

Parachutes failing to open or suspend stars or candles.

Prematures.

Loss or incorrectness of colour.

Incorrect number of stars.

Insufficient brilliancy of stars.
 Insufficient volume of smoke (candles only).
 Incorrect combination of colours.
 Short time of burning.
 Incorrect delays (No. 48 grenade only).
 Signals becoming entangled with parachute strings.

51. Instructions for sentencing.—If not more than $12\frac{1}{2}$ per cent. of failures occur at first proof, the lot will be sentenced "serviceable."

If more than $12\frac{1}{2}$ per cent. but less than 20 per cent. of failures occur at first proof, a second proof of double the number selected for first proof, subject to a maximum of 24, will be taken.

If 20 per cent. or more of failures occur at first proof, the Lot will be sentenced "unserviceable."

If the combined proofs result in not more than $12\frac{1}{2}$ per cent. of failures, the Lot will be sentenced "serviceable." If more than $12\frac{1}{2}$ per cent. of failures occur, the Lot will be sentenced "unserviceable."

In the case of grouped stores the instructions laid down in para. 14 will be followed.

52. Destruction of unserviceable grenades.—See para. 20. Burning should not be resorted to unless other methods are unsuitable. If burnt the signals must first be carefully broken down.

Note.—For instruction as to the examination and sentencing of cartridges, S.A. rifle grenade, .303-in., see R.A.O.S., Part II, Pamphlet No. 6.

F. GRENADES, RIFLE, SMOKE, $2\frac{1}{2}$ -INCH, No. 63, MK. I

52A. Selection for proof.—Proof will not be carried out on grenades under three years old from the date of filling, if in visually good condition. If in doubtful condition or over three years old from the date of filling, 3 per cent. will be selected for proof with a minimum of three and a maximum of 24 for any one proof. Up to 300 may be grouped in accordance with para. 11.

52B. Proof.—Grenades selected for proof will be fired from a rifle using a "Discharger, grenade, rifle, $2\frac{1}{2}$ -in., No. 1" and a "Cartridge, S.A., rifle grenade, .303-in. ballistite, H, Mk. 1z". The grenade should give a full emission of smoke for a period of 60 ± 10 seconds. The time of delay should be from three to eight seconds.

52c. Failures.—The following defects will be regarded as failures at proof :—

- Failure to ignite.
- Incorrect delay.
- Insufficient smoke.
- Short time of burning.
- Intermittent smoke emission.

52D. Instructions for sentencing.—As laid down in para. 51.

52E. Destruction of unserviceable smoke grenades.—Unserviceable smoke grenades will be disposed of as laid down in para 22, but, before the grenades are packed into weighted packages, the discs at the bases will be pierced to allow the ingress of water.

G. LIGHTS

Long—blue or green or red.

Short—G.S.

53. Selection for proof.—The number to be selected for proof is normal (para. 4), but will be increased to 5 per cent. if any of the lights, irrespective of age, appear to be in a doubtful condition.

54. Age limit.—Lights long, blue or green or red, on reaching the age of ten years will be considered unserviceable and no further proof will be carried out.

55. Proof.—The lights to be proved will be fired as for service, preferably by night. The lights should give the following times of burning :—

Long, blue	...	...	...	1 min. 45 secs.
„ green	...	...	...	1 „ 15 „
„ red	...	...	...	1 „ 45 „
Short, G.S.	...	...	...	1 „ 15 „

The lights should burn steadily, give good illumination and be of correct colour.

56. Failures.—The following will count as failures at proof :—

- Failure to ignite.
- Short time of burning.
- Loss of colour.
- Ineffective illumination.
- Failure to burn completely through.

57. Instructions for sentencing.

- (a) Lights which are over age will be sentenced "unserviceable" or "unserviceable, for display purposes only", at the discretion of the I.O.O.
- (b) Of those proved, if not more than $12\frac{1}{2}$ per cent. of failures occur at first proof, the Lot will be sentenced "serviceable."

If more than $12\frac{1}{2}$ per cent. but less than 20 per cent. of failures occur at first proof, a second proof of double the number selected for first proof, subject to a maximum of 24, will be taken.

If 20 per cent. or more of failures occur at first proof, the Lot will be sentenced "unserviceable" or "unserviceable, for display purposes only", at the discretion of the I.O.O.

If at the combined proofs not more than $12\frac{1}{2}$ per cent. of failures occur, the Lot will be sentenced "serviceable." If more than $12\frac{1}{2}$ per cent. of failures occur, the Lot will be sentenced "unserviceable," or "unserviceable, for display purposes only," at the discretion of the I.O.O.

- (c) Lights sentenced "unserviceable, for display purposes only" will be considered unsuitable for any Service purpose. They may be expended at the discretion of the general or other officer commanding, or destroyed, if no opportunity occurs of expending them, to prevent an undue accumulation.
- (d) Grouped stores will be dealt with as laid down in para. 11.

H. PORTFIRES**Common Friction**

58. Selection for proof.—The normal 2 per cent. may be increased at the discretion of the I.O.O. up to 5 per cent. irrespective of age, if the portfires appear to be in a doubtful condition. When portfires have been in practical use by the I.O.O. in carrying out proof of rockets, etc., such use may be taken into account for the purpose of judging proof of portfires of the same make and date, etc., held on charge.

59. Proof.—The selections will be burnt as for Service, held in "Stick Portfire" and kept slowly moving to prevent the accumulation of slag.

"Portfires Common" should be ignited by slowmatch or

“ match, fuze, safety,” and should burn for at least eight minutes.

“ Portfires Friction ” carry their own means of ignition and should burn for two minutes.

J. ROCKETS

Light Parachute, 1-lb., green or red or white.

Signal, 1-lb. and $\frac{1}{2}$ -lb., blue or green or red.

„ 1-lb. and $\frac{1}{2}$ -lb., Service.

60. Selection for proof.—The normal 2 per cent. may be increased at the discretion of the I.O.O. up to 5 per cent. irrespective of age if the rockets appear to be in doubtful condition.

61. Age Limit.*—Rockets, signal, 1-lb. and $\frac{1}{2}$ -lb. Service, on reaching the age of ten years, and all other rockets aforementioned on reaching the age of five years, will be considered unserviceable, but further proof will be carried out to ensure that their safe life is not exceeded.

62. Proof.—Proof will be carried out by firing as for Service, from the “ Stand, signal, rocket,” and, in the case of coloured rockets, will be at night when practicable.

The sticks to be used are as follows :—

For 1-lb. rockets, 5-ft. with notch.

For $\frac{1}{2}$ -lb. rockets, 4-ft. 2-in.

Rockets will be secured to the sticks by means of nib pieces, which will be pressed into the notches in the sticks to secure them when firing.

63. Rockets will only be fired over a clear course, preferably water. If fired over land, only such a course will be selected as will admit of the recovery of any blind rocket, and care must be taken not to fire off rockets if aircraft are flying low over the course.

If a clear course is not obtainable, proof will be carried out in calm weather, care being taken that the stand is fixed firmly and upright ; there should be no movement of the stand on the rocket lifting. These precautions will ensure that rockets fall close to the firing point.

65. Rockets should burst soon after reaching their highest altitude, which should be about 600 ft. for the 1-lb. and 400 ft. for the $\frac{1}{2}$ -lb. rockets.

* These instructions are temporarily in abeyance (see A.C.Is.).

In rockets so fitted, the parachute should open out correctly and suspend the star.

66. The following shows the minimum number of stars which should be ignited, and their minimum time of burning :—

Nature of Rocket.	Number of stars.	Stars to burn. Secs.
Light and sound, 1-lb.	1	10
Light, parachute, 1-lb. green or red or white	1	35
Signal 1-lb., blue or green or red ...	32	5
„ $\frac{1}{2}$ -lb., blue or green or red ...	20	5
„ 1-lb., Service	18	3
„ $\frac{1}{2}$ -lb., Service	14	3

67. **Failures.**—The following count as failures at proof :—

Prematures.

Failure to ignite.

Blinds.

Short time of burning of star or stars.

A noted deficiency of stars ignited ; star or stars not ignited.

Loss or incorrectness of colour.

Insufficient brilliancy of star or stars.

Parachute failing to open.

Parachute failing to suspend star.

Failure to reach correct altitude or to light up correctly.

68. **Instructions for sentencing.**—As for Lights, *see* para. 57, but a premature entails a sentence of unserviceable for any purpose.

69. Rockets sentenced “ unserviceable, for display purposes only,” will be treated in the same manner as lights so sentenced (*see* para. 57).

L. SIGNALS, VERTICAL LIGHT RAY

Yellow to Green

Yellow to Red

77. **Proof.**—Signals selected for proof will be fired vertically from a 2-in. discharger. Cartridge, S.A., rifle grenade, .303-in., ballistite, H, Mk. Iz, being used. The signal should rise to a height of 400–500 ft. leaving a trail of yellow fire which changes at the vertex to green or red. The yellow light should last about 3 secs. and the second colour about 2 secs.

78. Failures.—The following will count as failures at proof :—

- Failure to ignite.
- Delay in ignition.
- Inconspicuous trail of fire.
- Failure to change colour.
- Insufficient time of burning.
- Insufficient brilliancy.
- Breaking up in flight.

M. THUNDERFLASHES

79. Proof.—The thunderflashes are fired as for Service. They must ignite satisfactorily and explode with a good volume of sound and a brilliant white flash four to six seconds after lighting.

79A. Selection for proof.—5 per cent. of thunderflashes over two years old or in doubtful condition will be selected for proof.

80. Failures.—The following will count as failures at proof :—

- Failure to ignite.
- Insufficient volume of sound.
- Prematures.
- Hangfires (more than 12 seconds delay).

In carrying out proof of this store, safety precautions will be observed. In the event of a failure to explode, the thunderflash will not be approached until at least 5 minutes have elapsed.

80A. Instructions for sentencing.—As for Grenades, *see* para. 51.

N. TUBES, FRICTION

Machine, Rocket, Signal

81. Selection for proof.—The rules laid down for selection of tubes for proof in R.A.O.S., Part II, Pamphlet No. 5, will apply, but tubes need not be separately proved if sufficient information as to their condition has been obtained at proof of rockets.

82. Proof will be carried out by firing the selected tubes in the "Machine, rocket, signal," as for Service.

83. Instructions for sentencing.—The rules laid down or sentencing tubes in R.A.O.S., Part II, Pamphlet No. 5, will apply.

84. Disposal of unserviceable tubes.—*See* para. 20 (2) (a).

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