

UNCLASSIFIED

AD NUMBER	
AD338816	
CLASSIFICATION CHANGES	
TO:	unclassified
FROM:	restricted
LIMITATION CHANGES	
TO:	Approved for public release, distribution unlimited
FROM:	Controlling Organization: British Embassy, 3100 Massachusetts Avenue, NW, Washington, DC 20008.
AUTHORITY	
DSTL, AVIA 6/21257, 23 Jul 2008; DSTL, AVIA 6/21257, 23 Jul 2008	

THIS PAGE IS UNCLASSIFIED

TECH. NOTE
WE. 22

RESTRICTED

TECH. NOTE
WE. 22

U.S. CONFIDENTIAL - Modified Handling Authorized
U.K. RESTRICTED

ROYAL AIRCRAFT ESTABLISHMENT

(FARNBOROUGH)

Decl OADR

TECHNICAL NOTE No. WE 22

NOTES ON THE
ELECTRICAL SENSITIVITY
OF WIREBRIDGE FUZEHEADS

by

C. E. White

PICATINNY ARSENAL
TECHNICAL INFORMATION SECTION

1. THIS INFORMATION IS DISCLOSED ONLY FOR OFFICIAL USE BY THE RECIPIENT GOVERNMENT AND SUCH OF ITS CONTRACTORS, UNDER SEAL OF SECRECY, AS MAY BE ENGAGED ON A DEFENCE PROJECT. DISCLOSURE TO ANY OTHER GOVERNMENT OR RELEASE TO THE PRESS OR IN ANY OTHER WAY WOULD BE A BREACH OF THESE CONDITIONS.

2. THE INFORMATION SHOULD BE SAFEGUARDED UNDER RULES DESIGNED TO GIVE THE SAME STANDARD OF SECURITY AS THAT MAINTAINED BY HER MAJESTY'S GOVERNMENT IN THE UNITED KINGDOM.

3. THE RECIPIENT IS WARNED THAT INFORMATION CONTAINED IN THIS DOCUMENT MAY BE SUBJECT TO PRIVATELY-OWNED RIGHTS.

APRIL, 1963

MINISTRY OF AVIATION

THIS DOCUMENT IS THE PROPERTY OF H.M. GOVERNMENT AND ATTENTION IS CALLED TO THE PENALTIES ATTACHING TO ANY INFRINGEMENT OF THE OFFICIAL SECRETS ACTS, 1911-1939

It is intended for the use of the recipient only, and for communication to such officers under him as may require to be acquainted with its contents in the course of their duties. The officers exercising this power of communication are responsible that such information is imparted with due caution and reserve. Any person other than the authorised holder, upon obtaining possession of this document, by finding or otherwise, should forward it, together with his name and address, in a closed envelope to:-

THE SECRETARY, MINISTRY OF AVIATION, LONDON, W.C.2

Letter postage need not be prepaid, other postage will be refunded. All persons are hereby warned that the unauthorised retention or destruction of this document is an offence against the Official Secrets Acts.

20071009009

RESTRICTED
U.S. CONFIDENTIAL - Modified Handling Authorized
U.K. RESTRICTED

Key 57488

RESTRICTED

U.D.C. No. 623.454.257

Technical Note No. WE 22

April, 1963

R O Y A L A I R C R A F T E S T A B L I S H M E N T

(FARNBOROUGH)

NOTES ON THE ELECTRICAL SENSITIVITY OF WIREBRIDGE FUZEHEADS

by

C. E. White

R.A.E. Ref: LSW/138 /01

SUMMARY

The electrical sensitivity to D.C. pulses of a range of service fuzeheads, developed for operation of explosive motors, is illustrated by graphs and tables, and some of the methods employed for acquisition of the data are discussed.

RESTRICTED

LIST OF CONTENTS

	<u>Page</u>
1 INTRODUCTION	3
2 METHODS FOR DETERMINATION OF THE SENSITIVITY OF WIREBRIDGE FUZEHEADS	3
2.1 Basic theory	3
2.2 Constant current method	4
2.3 Capacitor discharge method	5
2.4 Effects of resistance variation	7
3 OBSERVATIONS ON THE RESULTS OF FIRING PROOF AND LABORATORY TESTS	8
LIST OF REFERENCES	9
ADVANCE DISTRIBUTION LIST	9
APPENDIX 1 - Fundamental data	10-11
ILLUSTRATIONS - Figs.1-8	-
DETACHABLE ABSTRACT CARDS	-

LIST OF ILLUSTRATIONS

	<u>Fig.</u>
Graphs of current/time relationship for terminated pulse firing	1-4
Graphs of energy/time relationship derived from the results of terminated pulse firing	5-8

1 INTRODUCTION

1.1 The performance of a service range of wirebridge fuzeheads developed during the period 1955-59, for operation of explosive motors, is substantially similar to that of a well-known proprietary range; dimensions and constructional details are also identical, except that the stem of the service fuzeheads consists of a wafer of synthetic resin bonded paper (S.R.B.P.) compared with "pressboard" in the proprietary range. The metallic foil to which, in both ranges, the bridge-wire and external connections are soldered, is copper in the service fuzeheads, and brass in the proprietary types. Only the change of stem material has any significance in regard to performance, the S.R.B.P. conferring improved climatic durability and storage life by virtually eliminating a tendency for the stem to absorb moisture when subjected to high humidity and temperature. The explosive compositions are identical in the two ranges.

1.2 Specifications Air 1447 and Air 1453, relating to the S.R.B.P. and press-board fuzeheads respectively, contain information necessary for performance of acceptance and firing proof tests; they do not disclose the sensitivity parameters, which are essential for the design of efficient and reliable firing circuits, and the study and alleviation of electro-magnetic hazards.

1.3 The foregoing remarks indicate that the information contained in this note is of equal significance to both the service and the proprietary range, including some fuze assemblies embodying items from the latter, e.g. fuze electric F.53, F.73, etc.

2 METHODS FOR DETERMINATION OF THE SENSITIVITY OF WIREBRIDGE FUZEHEADS

2.1 Basic theory

The ignition of an explosive primer surrounding an electrically heated bridgewire depends upon a simple thermal process², involving conduction of sufficient heat from the bridgewire to the composition, such that the temperature of a localised region immediately surrounding the bridge is raised to the ignition temperature of the particular composition.

If the electrical energy supplied to the bridge is insufficient to achieve the ignition temperature within an extremely short interval of time, a further increment of energy is necessary, and this must be applied at a greater rate than the loss of heat occurring by thermal conduction from the bridgewire to its surroundings, which include the explosive composition, and the relatively large masses of solder used to secure the bridge to the metal foils. This condition is satisfied by the passage of a current such that the heat generated in a given time interval exceeds the heat lost by the system. Because of the excess of energy supplied over energy lost, the temperature of the bridge increases, until some of the explosive composition in contact with it is raised to the ignition temperature.

Consideration of this firing mechanism indicates that the total energy to ensure ignition is comprised of two distinct increments, one, known as basic energy, is the minimum value that will, under any circumstances, and however rapidly it is applied, raise some part of the composition surrounding the bridgewire to the ignition temperature. The second increment is required to

provide extra energy to balance the losses arising from thermal conduction, i.e. cooling of the bridgewire, and is, therefore, a function of the application time. Hence, ignition will occur if the basic energy is supplied to the bridgewire so quickly that loss of heat is negligible during the time it is being applied, but for longer application times the total energy necessary for initiation is,

$$W = W_0 + mt \quad (1)$$

where, W = the energy required to initiate the primer in time t

W_0 = basic energy

m = rate of heat loss (in Joules/second = watts)

If the rate of energy loss is denoted by $\frac{\Delta W}{\Delta t}$, equation (1) becomes,

$$W = W_0 + \frac{\Delta W}{\Delta t} t \quad (2)$$

2.2 Constant current method

The information required for evaluation of this parameter is derived from tests as follows:- A firing circuit is employed which contains a variable resistor in series with the fuzehead under test, and a timing switch capable of being adjusted to make contact for any selected time within the range of about 5.0 to 50.0 milliseconds. Batches of fuzeheads are tested with the same pulse duration, the current being adjusted to a selected value for each batch, and a value is found which just suffices to fire all specimens of a particular type of fuzehead. Similarly, by reducing the current progressively for successive batches, a value is found which just fails to fire any specimens. These values of current are known as 100% initiation, and 0% initiation, or "all-fire", and "no-fire", values respectively, intermediate values of current naturally being associated with percentage initiations lying between these limits. Obviously, the information derived from such a test (known as the "run-down method") is exclusive to a particular pulse duration, hence a complete investigation of the relationship between initiating energy, and the time taken to apply it to the bridgewire, requires a number of such test sequences, each performed with a different pulse duration.

If $I_1^2 r t_1$ and $I_2^2 r t_2$ represent the energy for 100% initiations with two different pulse durations t_1 and t_2 respectively, it is clear that the slope of energy loss with time is given by,

$$\frac{\Delta W}{\Delta t} = \frac{I_2^2 r t_2 - I_1^2 r t_1}{t_2 - t_1} \quad (3)$$

Hence, equation (2) becomes,

$$W = W_0 + \left[\left(\frac{I_2^2 r t_2 - I_1^2 r t_1}{t_2 - t_1} \right) t \right] \quad (4)$$

where, I_1 and I_2 = current values required to produce 100% initiations in times t_1 and t_2 respectively, and

t = any time interval for which the initiating energy is required

Tests of this type are normally performed with about four or five different pulse durations within the range 5.0 to 50.0 milliseconds, and the results produce typical ogives related to the various time intervals, from which frequency distributions of current and energy may be plotted.

It is important to note that information relating to the sensitivity of fuzeheads cannot be derived with comparable accuracy from the simpler procedure known as "time-to-fire" tests, i.e., in which the time interval between switching on the current and "firing" is measured, because the end event used to operate the time recorder necessarily occurs after initiation (by an interval known as the "burning time"), and although this parameter is usually negligible when the initiation time is greater than 10.0 milliseconds³, it can be extended, for instance, by climatic cycling, and may then completely invalidate estimates of sensitivity derived from the results of such tests.

2.3 Capacitor discharge method

The basic initiation energy of fuzeheads can be determined by a more direct method than the one described above, which, although simpler in principle, involves considerably more instrumental difficulty. This is the capacitance firing circuit, in which the fuzehead under test is connected directly across a charged capacitor. The capacitance, and the voltage to which it is charged initially, can be accurately measured without difficulty, and from the results of experimental work directed to the determination of the effective resistance of capacitors during discharge, it is possible to select a practically loss-free component. Since general circuit losses may also be reduced to negligible proportions by the use of heavy conductors, the only serious source of loss is the switch.

This has been known for some considerable time, and several attempts have been made to design loss-free switches for firing electro-explosives, the two most recent being the lead block switch designed by an inspectorate working party, and based upon a prototype produced by R.A.R.D.E., and the so-called "translational" mercury switch evolved from the work of an instrumentation working party sponsored by a number of R. and D. establishments. The present position is that the lead block switch has become obsolete, consequent upon the disclosure of various deficiencies, and the translational mercury switch is now undergoing design evaluation tests. The results of these tests, to date, are not entirely encouraging.

However, although the capacitance firing circuit cannot yet be regarded as a precision method for determination of the basic initiation energy of electro-explosives, its errors can be evaluated from the results of tests with an "erg-meter" and allowed for in practical trials, provided the losses are consistent, i.e., similar for each "shot". Thus, if the switch resistance is accurately known, and it is known also that other losses in the apparatus are negligible, the energy received by the fuzehead under test is given by,

$$J = \frac{1}{2} C V^2 \left(\frac{r_1}{r_1 + r_2} \right) \quad (5)$$

where, J = energy received by fuzehead under test

C = capacitance

V = voltage

r_1 = resistance of fuzehead under test

r_2 = loss resistance of switch

Assuming the loss resistance to be one ohm, the proportion of the energy in the capacitor which fails to reach the fuzehead under test, varies according to the bridgewire resistance as follows:-

<u>Type of fuzehead</u>	<u>Percentage of energy lost in switch</u>
Types E & K	50.0
Type F	12.5
Types H & J	7.2
Type G	8.3

As with constant current, or square pulse, tests, loss of heat occurs during the time energy is being supplied from a capacitance firing circuit, and if it is assumed that the rate of heat loss is the same as during the former type of test, and that all the energy in the capacitor has been transferred to the bridgewire when the voltage has fallen to 0.1 of its initial value, the time occupied by this process is,

$$t = \log_e \frac{V}{V} C r = 2.3 C r \quad (6)$$

where, C = capacitance

r = resistance of fuzehead

V = voltage to which capacitance was charged initially

v = 0.1V

hence,

$$m = \frac{\Delta W}{\Delta t} (2.3 C r) \quad (7)$$

where, m = energy lost due to cooling during the capacitor discharge

$\frac{\Delta W}{\Delta t}$ = slope of energy loss (as determined from constant current tests)

For most practical purposes this loss of heat may be disregarded, and the energy required to fire fuzeheads when a substantially loss-free capacitance firing circuit is employed may be regarded as a very close approximation to the real basic energy. However, if low voltages, and hence larger capacitance values, are employed, the error may not be insignificant. For instance, if $C = 10.0$ microfarads, and $r = 10.0$ ohms, equation (6) shows that 99.0 per cent of the energy will be transferred to the bridgewire in time $2.3 \times 10^{-5} \times 10 = 0.00023$ second. If the slope of heat loss for the fuzehead is 0.16 Joules per second (a typical value), the energy lost due to cooling will be,

$$0.16 \times 0.00023 = 37 \text{ microjoules,}$$

an error of considerable importance in relation to type G, in which the basic energy to initiate is around 200 microjoules.

2.4 Effects of resistance variation

The increase of resistance of the bridgewire during the time of application of the firing energy, introduces an error, which, in general, results in under-estimation of the initiation energy. The error can be eliminated, simultaneously with another, which derives from the use of the mean resistance of a population of fuzeheads, by the use of "constant energy" circuits, i.e., in which $I^2 r$ is approximately constant during any time interval, notwithstanding initial deviations of resistance from a known or assumed mean value, and changes of resistance during the interval occupied by application of the firing energy.

The effects of energy evaluation using mean resistance values are not fully understood, since there appears to be no correlation between ignition energy and resistance. An extended programme of research aimed at elucidation of the fundamentals of wirebridge initiation is a necessary preliminary to decisions concerning the relative merits of constant current and constant energy testing

circuits. It is possible that no significant error arises from the use of mean resistance values, but failure to allow for an increase of resistance whilst the firing current is flowing results, as stated above, in under-estimation of the energy required for initiation.

3 OBSERVATIONS ON THE RESULTS OF FIRING PROOF AND LABORATORY TESTS

3.1 During the period 1955-62, many thousands of fuzeheads have been fired by the two methods described, i.e., constant current pulse, and capacitor discharge, with the object of establishing sensitivity criteria of the range employed for operation of explosive motors. The interests of weapon arming and fuzing emphasise, (a) reliability, and (b) hazards due to electro-magnetic pick-up, hence the work has been directed towards accurate determination of all-fire and no-fire levels of current, and/or energy, corresponding to the upper and lower quartile regions of the ogives derived from graphical representation of functioning reliability, as related to these parameters. This neglect of mean values is justified by the skew frequency distributions which are typical of these distributions, and which tend to invalidate all-fire and no-fire estimates based upon normal distributions, e.g., the Bruceton method⁴.

3.2 The accompanying results show the extremes that have been observed, and are unique in being derived from many different manufacturing lots or batches over a comparatively long period. It must be emphasised, however, that the results do not give information about mean values, which are nearer to the no-fire values than might be expected, especially in the longer application time region.

3.3 Extrapolation of energy characteristics to zero application time generally indicate values of basic energy lower than those found when using capacitor discharge circuits; this discrepancy is partly accounted for by losses in the capacitor firing gear, and partly by using ambient temperature bridgewire resistance values. Notwithstanding these known errors, it seems likely that the energy/time parameter does depart from linearity somewhere in the range between a few microseconds and 2.0 milliseconds. Indeed, future experimental work may disclose that the slope of heat loss is virtually zero up to application times of 10^{-2} , or even 10^{-3} , microseconds. Practical interest in this characteristic is slight, because any change of slope between the value determined from longer application time tests and zero would have an insignificant effect on the determination of basic energy.

3.4 The design of reliable firing circuits for use in service equipment requires the energy available to be at least twice the values for 100% initiations shown in Figs.5-8 (derived directly from Figs.1-4), that is, $\sqrt{2}$ times the firing current values shown in Figs.1-4, but when initiation is to be achieved by very short pulses, i.e., less than 5.0 milliseconds, or by capacitor discharge, a factor of three is more appropriate for the reasons given in para.1.12.

LIST OF REFERENCES

<u>No.</u>	<u>Author</u>	<u>Title, etc.</u>
1	De la Haye, R.G.	The climatic durability of fuze electric, type F.53. R.A.E. Technical Memo. Arm 1683.
2	Jones, E.	The ignition of solid explosive media by hot wires. Proc. Royal Soc., Vol.A.198, Page 523, (1949).
3	De la Haye, R.G., Post, P.W.	Functioning time of wirebridge fuzeheads. R.A.E. Technical Note Arm 618.
4	Princeton University	Statistical analysis for a new procedure in sensitivity experiments. Statistical Research Group, (AMP Report No.101.R).

ATTACHED:-

Appendix 1
Illustrations, Figs.1-8 (WE.R 3420-3427)
Detachable abstract cards

ADVANCE DISTRIBUTION LIST:-MOA

DGQ	A Arm 2(b)
DA Arm	A Arm 3(b)
NA/DA Arm	DCW(Tech)
ADA Arm 1	AD/GW (P & W)
ADA Arm 2	AD/GW (G & C)
ADA Arm 3	Chief Supt A & AEE
D/RPE	Secretary OB
D/ERDE	TIL 60

RAE

Director	Hd of Projects Group
DDRAE(E)	" " Research "
Pats 1/RAE	" " WE.1 Div Wpns
Library	" " " 2 " "
Hd of Weapons Dept	" " " 3 " "
" " IEE Dept	" " " 4 " "
" " IR Dept	" " " 5 " "
" " Space Dept	" " " 6 " "
Mr. C.E. White	" " " 7 " "

File (via Mr. B. Sykes)

External to MOA (through TIL)

Dr. F.E. Ball, D/RARDE, Fort Halstead
Mr. W. Forsyth, I.C.I. Ltd, Nobel Div, R & D Dept, Stevenston, Ayrshire
Mr. K. Bomford, AWRE, Aldermaston

APPENDIX 1FUNDAMENTAL DATA

		Parameter	Units	Types E & K A1 Blue B1 Brown	Type F A7 Pink	Types H & J A13 Orange B 13 Green	Type G A11 Magenta
(a)	Physical characteristics of bridgewires	Diameter of bridgewire	Inches	0.0016	0.0006	0.0004	0.00025
(b)		Length of bridgewire	Inches	0.06	0.06	0.06	0.02
(c)		Cross sectional area of bridgewire	Square inches	20.0×10^{-7}	2.83×10^{-7}	1.25×10^{-7}	0.49×10^{-7}
(d)		Surface area of bridgewire	Square inches	30.0×10^{-5}	11.3×10^{-5}	7.5×10^{-5}	1.57×10^{-5}
(e)		Volume of bridgewire	Cubic inches	12.0×10^{-8}	1.7×10^{-8}	0.75×10^{-8}	0.098×10^{-8}
(f)	Electrical characteristics of bridgewires	Nominal resistance of bridgewire	Ohms	1.2	7.0	13.0	11.0
(g)		Resistivity of wire used	Ohms per inch	19.8	117	216	550
(h)		Resistance limits of bridgewire	Ohms	0.9-1.6	6.0-8.0	10.0-16.0	8.0-14.0
(i)	Basic energy for 100% & 0% initiations	Basic 100% firing energy for application times less than one millisecond	Joules	0.0054	0.0011	0.00065	0.0002
(j)		Basic 0% firing energy for application times less than one millisecond	Joules	0.0036	0.00046	0.0002	0.0001
(k)	Firing current	Max. observed 100% firing current with 10 millisecond pulses	Amps	0.78	0.197	0.132	0.083
(l)		Max. observed 100% firing current with 50 millisecond pulses	Amps	0.40	0.166	0.115	0.08
(m)	No-fire current	Minimum observed no-fire current for absence of initiations up to 10 seconds	Amps	0.28	0.11	0.065	0.05

RESTRICTED

Technical Note No. WE 22
Appendix 1

		Parameter	Units	Types E & K A1 Blue B1 Brown	Type F A7 Pink	Types H & J A13 Orange B13 Green	Type G A11 Magenta
(n)	Rate of heat loss from bridge	Rate of heat loss from bridgewire at 100% initiation level	Joules per sec. (= watts)	0.192	0.167	0.157	0.064
(o)		Rate of heat loss from bridgewire at 0% initiation level	Joules per sec. (= watts)	0.08	0.067	0.05	0.025
(p)	Miscellaneous	Energy/volume relationship for 100% firing with pulses less than one milli-second	Joules per cubic in.	4.5×10^4	6.47×10^4	8.66×10^4	20.4×10^4
(q)		Energy/volume relationship for 0% firing with pulses less than one milli-second	Joules per cubic in.	3.0×10^4	2.7×10^4	2.7×10^4	10.2×10^4
(r)		Current density for 100% firing with 10.0 millisecond pulses	Amps per square inch	3.9×10^5	6.9×10^5	10.6×10^5	17.0×10^5

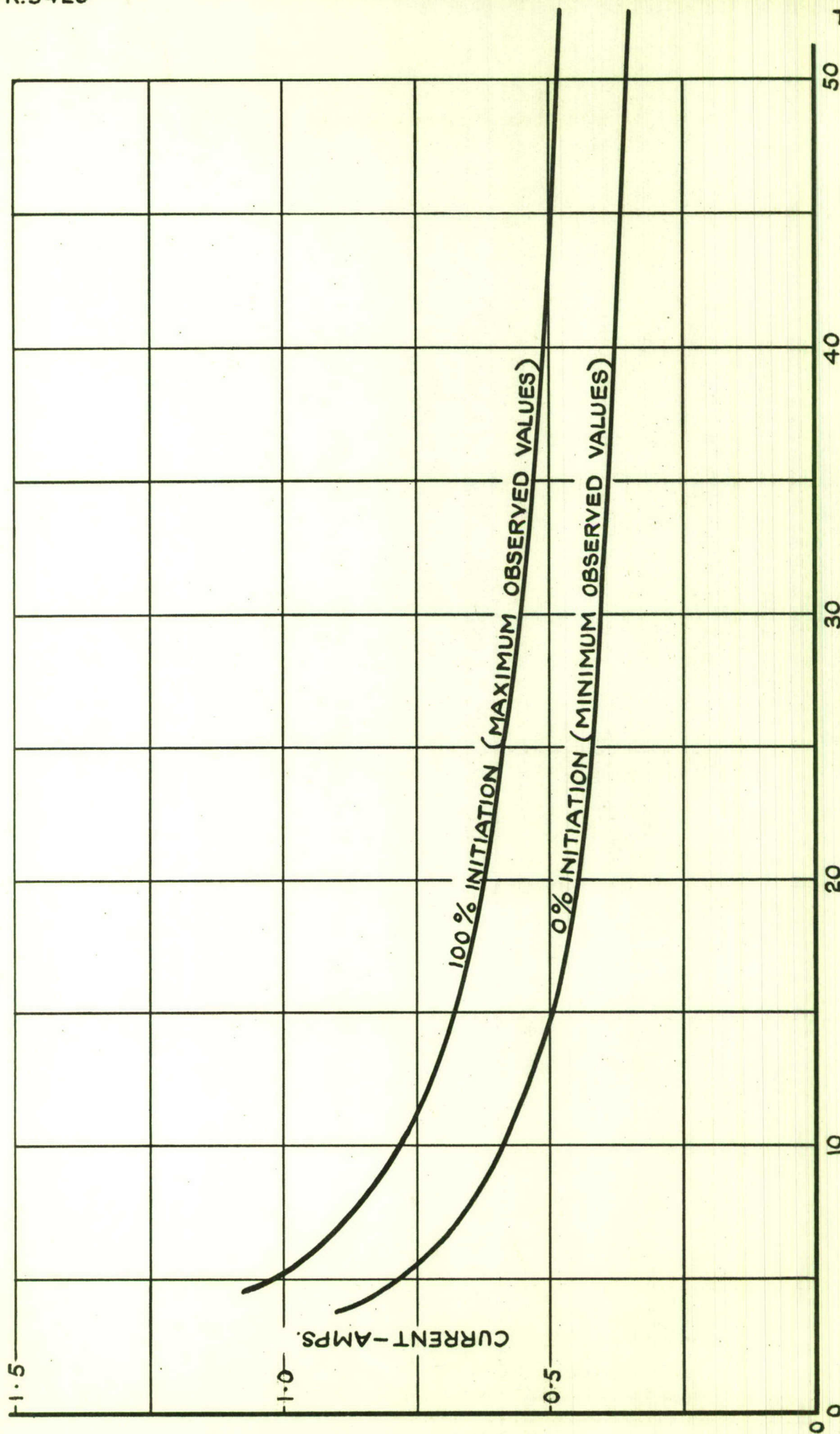


FIG. 1. TYPE E. FUZEHEAD (A1 ROYAL BLUE) & TYPE K FUZEHEAD (B1 BROWN),
SPEC. AIR 1447.

RESULTS OF TERMINATED PULSE TESTS AT 5, 10, 20, 30 & 50. m.secs.
ALL-FIRE & NO-FIRE CURRENT VALUES.

FIG.2.

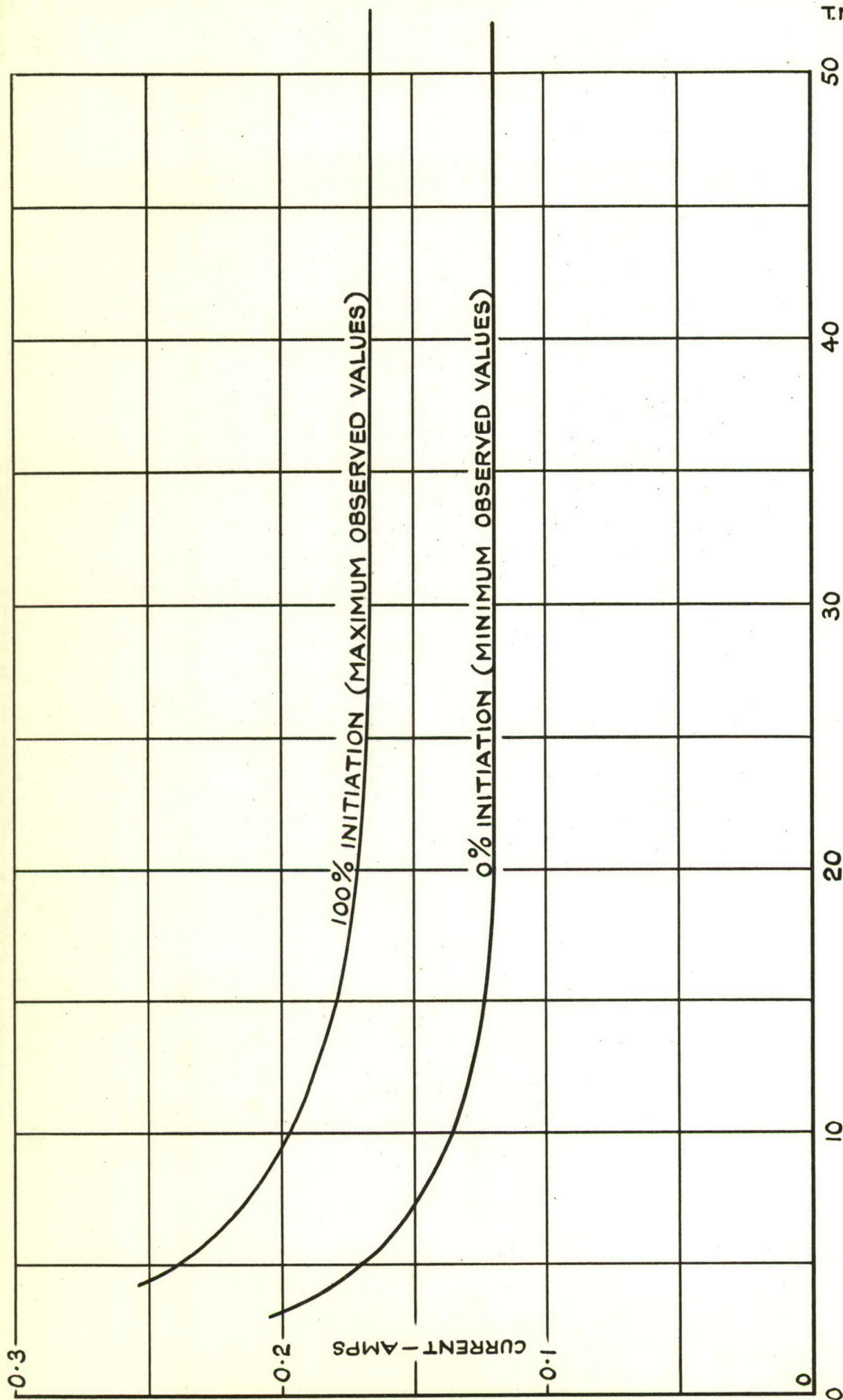


FIG.2. TYPE F FUZEHEAD (A.7. PINK), SPEC. AIR 1447.
 RESULTS OF TERMINATED PULSE TESTS AT 5, 10, 20, 30 & 50. m.secs.
 ALL - FIRE & NO - FIRE CURRENT VALUES.

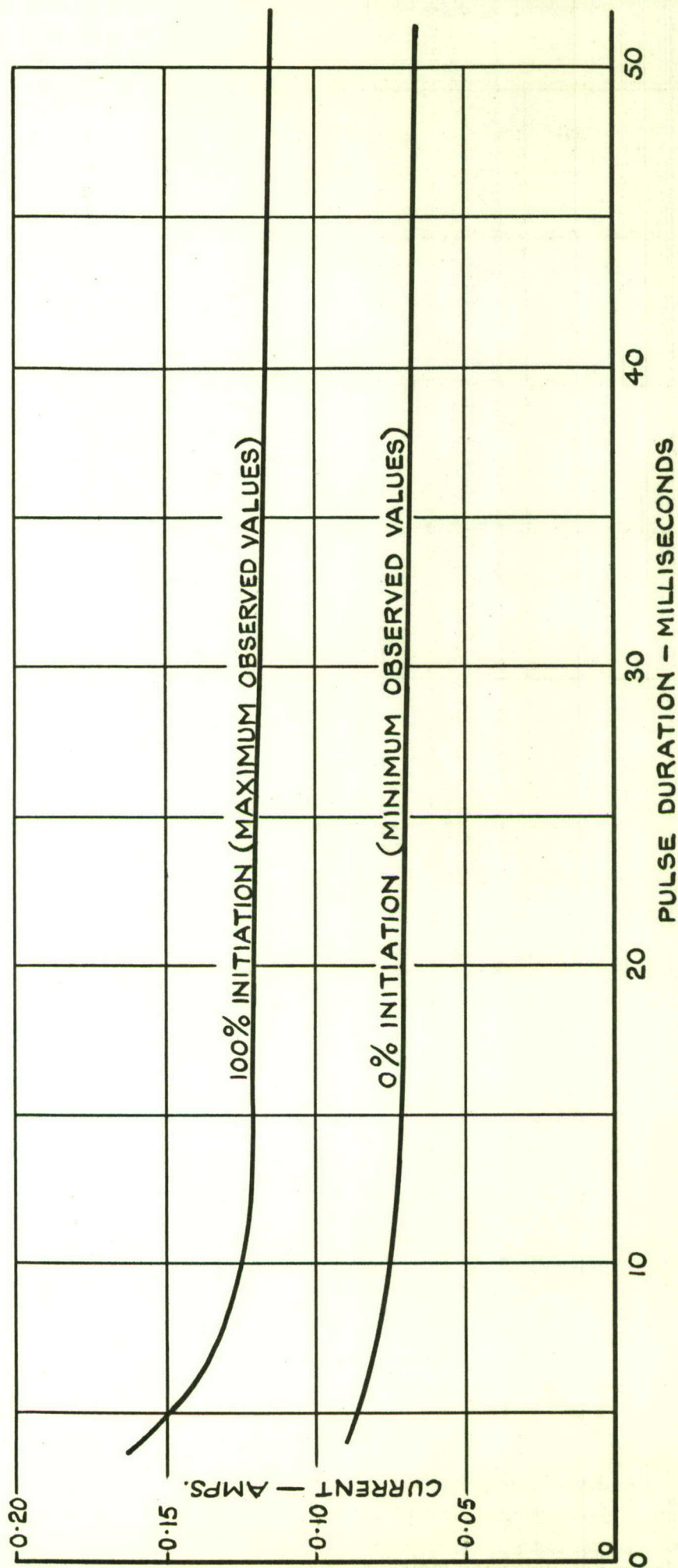


FIG. 3. TYPE H FUZEHEAD (A.13. ORANGE) & TYPE J FUZEHEAD (B13 GREEN),

SPEC. AIR 1447.

RESULTS OF TERMINATED PULSE TESTS AT 5, 10, 20, 30 & 50 m. secs.
ALL-FIRE & NO-FIRE CURRENT VALUES.

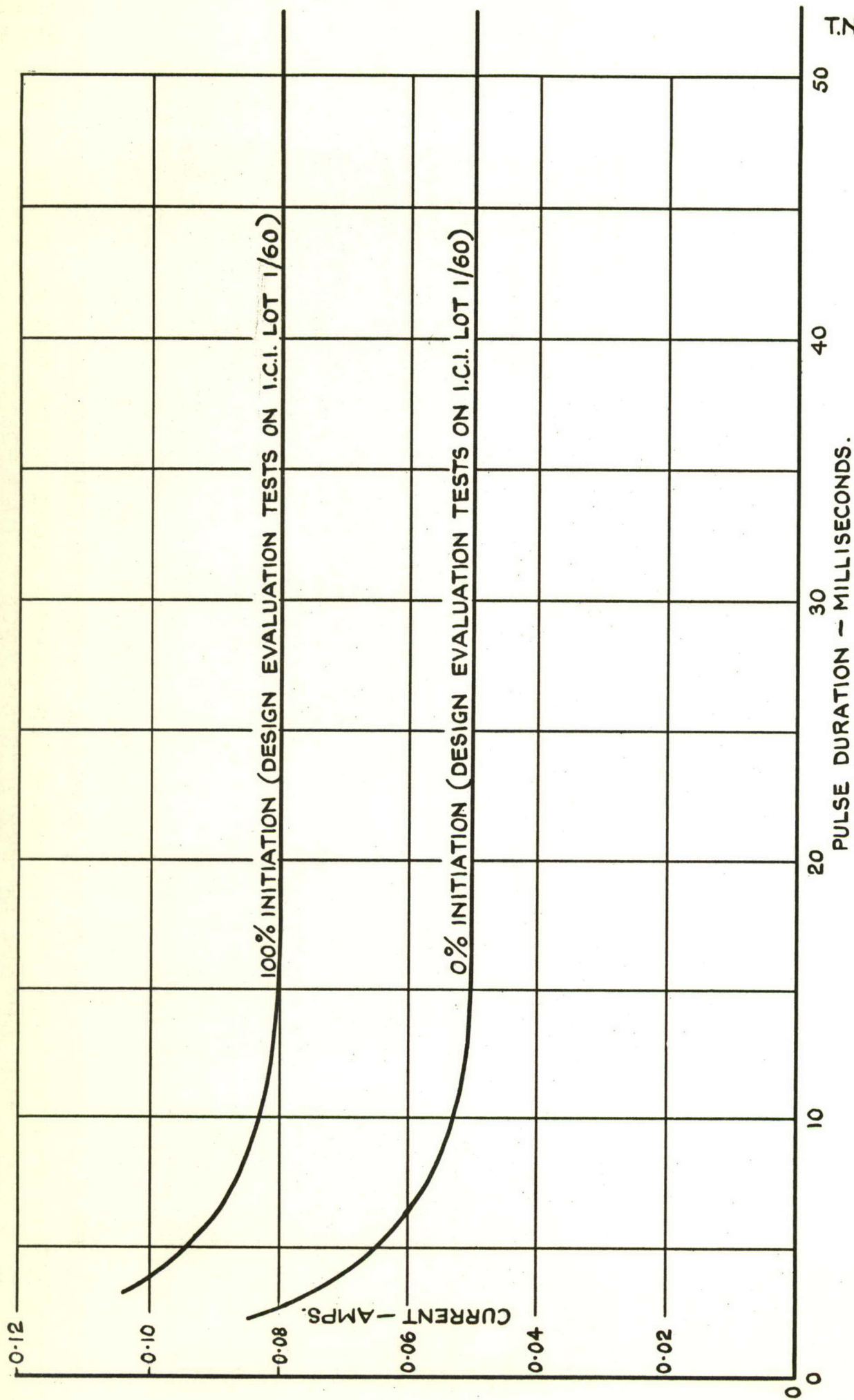


FIG. 4. TYPE G FUZEHEAD (A.II. MAGENTA), SPEC. AIR. 1447.
RESULTS OF TERMINATED PULSE TESTS AT 5, 10, 20, 30 & 50 m.secs.
ALL-FIRE & NO-FIRE CURRENT VALUES.

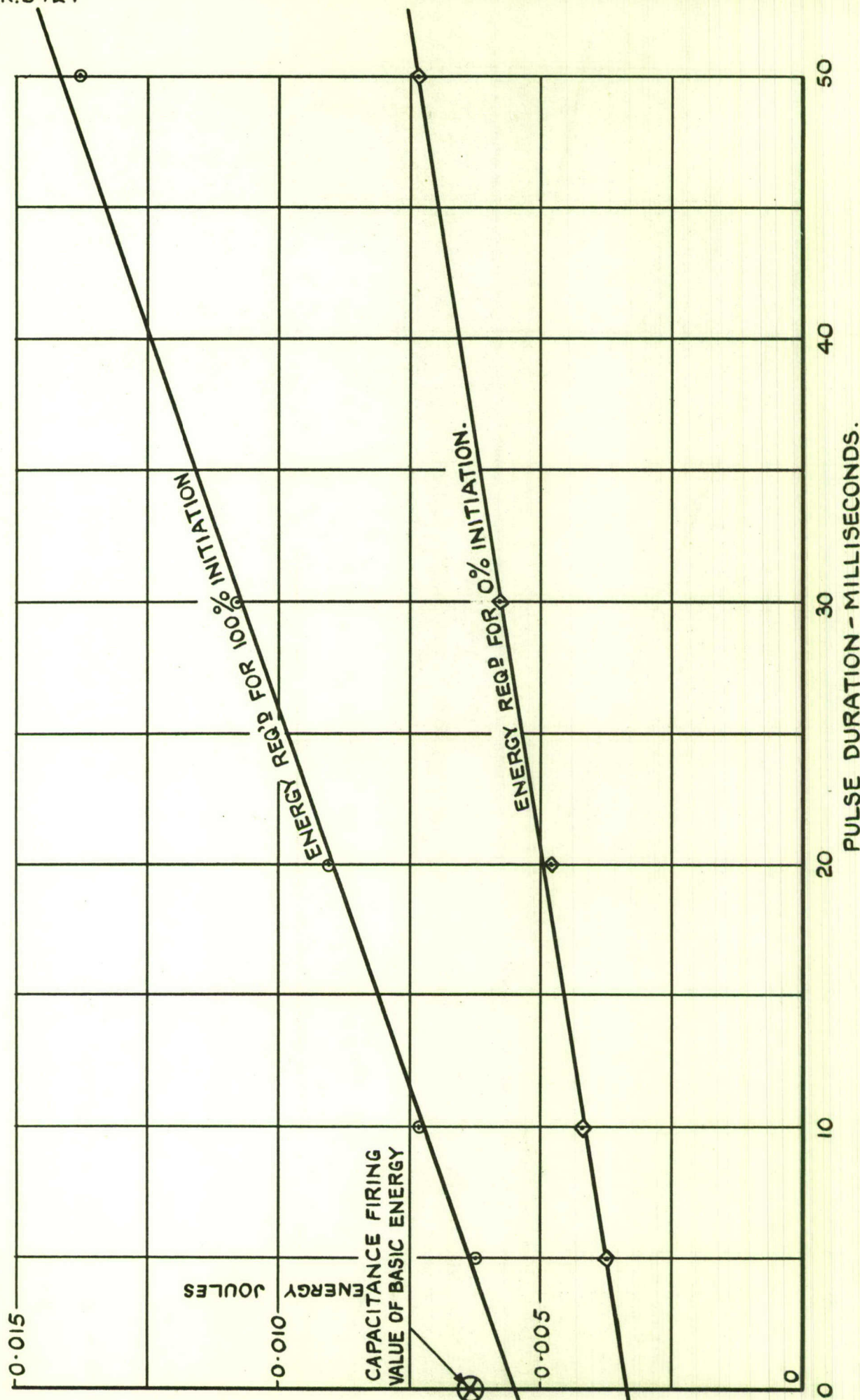


FIG.5. TYPE E FUZEHEAD (A.I. ROYAL BLUE) & TYPE K FUZEHEAD (B.I. BROWN), SPEC. AIR 1447.
 ENERGY/TIME RELATIONSHIPS DERIVED FROM TERMINATED PULSE TESTS. (NO ALLOWANCE MADE
 FOR CHANGE OF BRIDGE RESISTANCE DURING PULSE.)

FIG. 6.

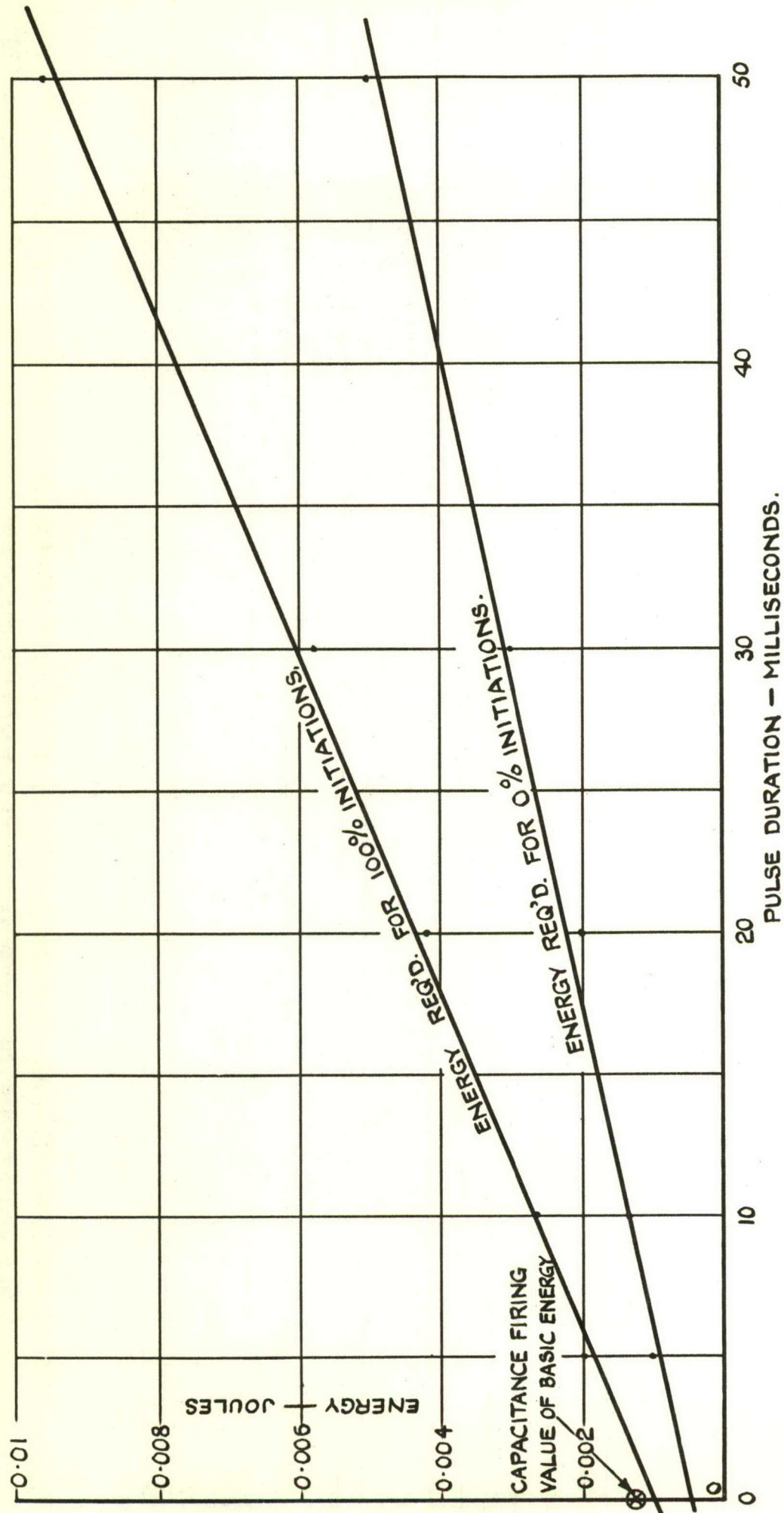


FIG. 6. TYPE F FUZEHEAD (A.7.PINK), SPEC. AIR 1447.
 ENERGY / TIME RELATIONSHIPS DERIVED FROM TERMINATED PULSE TESTS.
 (NO ALLOWANCE MADE FOR CHANGE OF BRIDGE RESISTANCE DURING TESTS.)

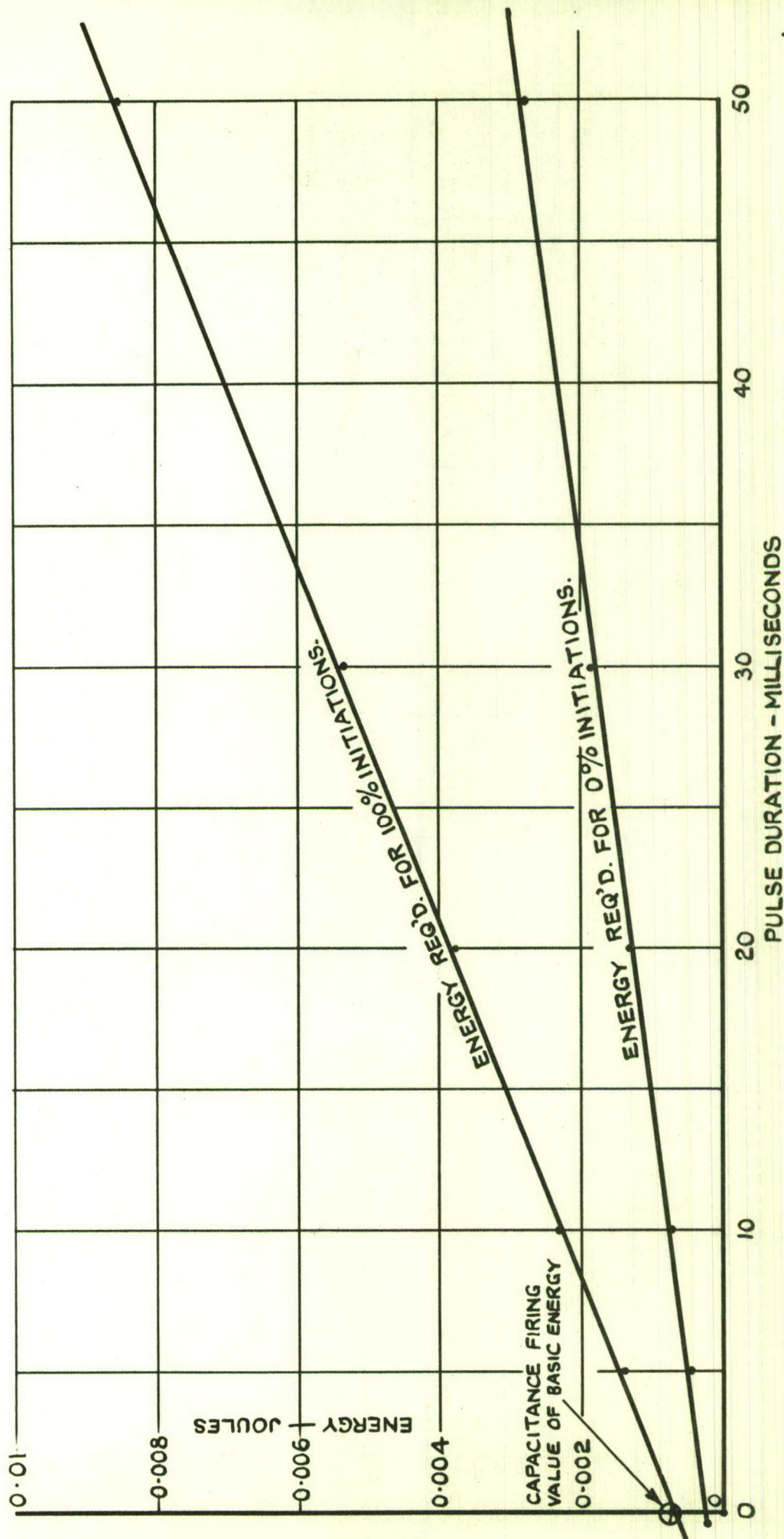


FIG. 7. TYPE H FUZEHEAD (A.13. ORANGE) & TYPE J FUZEHEAD (B.13. GREEN), SPEC. AIR 1447.
ENERGY / TIME RELATIONSHIPS DERIVED FROM TERMINATED PULSE TESTS. (NO ALLOWANCE
MADE FOR CHANGE OF BRIDGE RESISTANCE DURING TESTS.)

FIG. 8.

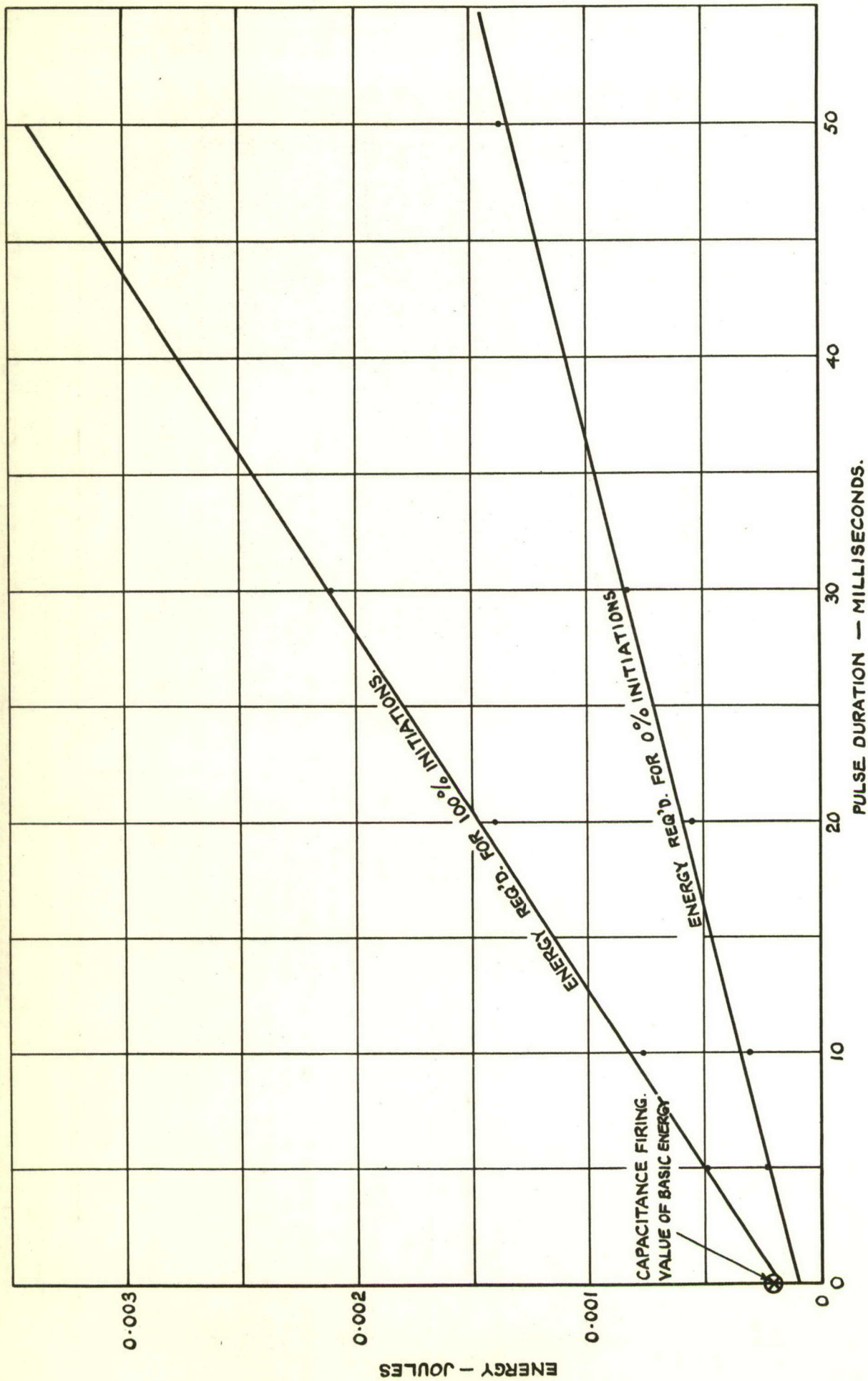


FIG. 8. TYPE G FUZEHEAD (AII MAGENTA), SPEC. AIR 1447.
 ENERGY/TIME RELATIONSHIPS DERIVED FROM TERMINATED PULSE TESTS.
 (NO ALLOWANCE MADE FOR CHANGE OF BRIDGE RESISTANCE DURING PULSE)

DETACHABLE ABSTRACT CARDS

The abstract cards detached from
this document are located as follows:-

1 _____ 2 _____

3 _____ 4 _____

Signed _____ Date _____

RESTRICTED



RESTRICTED



*Information Centre
Knowledge Service*
[dstl] Porton Down
Salisbury
Wiltshire
SP4 0DQ
22060-6218
Tel: 01980-613753
Fax 01980-613770

Defense Technical Information Center (DTIC)
8725 John J. Kingman Road, Suit 0944
Fort Belvoir, VA 22060-6218
U.S.A.

AD#: AD338816

Date of Search: 23 July 2008

Record Summary: AVIA 6/21257

Title: Notes on the Electrical Sensitivity of Wirebridge Fuzeheads
Availability Open Document, Open Description, Normal Closure before FOI Act: 30 years
Former reference (Department) Technical Note WE/22
Held by The National Archives, Kew

This document is now available at the National Archives, Kew, Surrey, United Kingdom.

DTIC has checked the National Archives Catalogue website (<http://www.nationalarchives.gov.uk>) and found the document is available and releasable to the public.

Access to UK public records is governed by statute, namely the Public Records Act, 1958, and the Public Records Act, 1967.
The document has been released under the 30 year rule.
(The vast majority of records selected for permanent preservation are made available to the public when they are 30 years old. This is commonly referred to as the 30 year rule and was established by the Public Records Act of 1967).

This document may be treated as **UNLIMITED**.