

UNCLASSIFIED

AD NUMBER: AD0812785

LIMITATION CHANGES

TO:

Approved for public release; distribution is unlimited.

FROM:

Distribution authorized to U.S. Government agencies only;
Administrative/Operational Use; 24 Apr 1967. Other requests shall be
referred to Naval Air Systems Command, Washington, DC 20360.

AUTHORITY

USNATF ltr 16 Jul 1974

NATF(SI) REPORT OF TEST RESULTS
NATF(SI) 13800/16 (3/67)

REPORT NO: NATF(SI)-R1
DATE: 24 April 1967

D D G
RECEIVED
MAY 1 1967
B

AD 81 85 2

NATF(SI) REPORT OF TEST RESULTS

FROM Commanding Officer, NATF(SI), Lakehurst, N.J. 08733		
TO Commander, Naval Air Systems Command (AIR-5373), Washington, D.C. 20360		
DIRTASK A 05 537 007/204/1/ S-416-00-05	WORK UNIT AIR-5373-211/204/1 TASK NO. 211-1	EFFORT LEVEL NORMAL

PROJECT TITLE
British-type wire supports; evaluation of

DATES OF TESTS 8 January to 4 March 1967	LOCATION OF TEST Runway Arrested Landing Site (NATF(SI))
NATF(SI) PROJECT ENGINEER George K. Rusk	
ENCLOSURES <input checked="" type="checkbox"/> 4 PHOTOGRAPHS <input type="checkbox"/> DRAWINGS <input type="checkbox"/> TABLES <input type="checkbox"/> CURVES <input type="checkbox"/> APPENDIX	

RESULTS (Introduction, Results and Discussion)

Ref: (a) NAVAIRSYSCOM ltr AIR 5373B/29:LW of 8 Mar 1967

INTRODUCTION

1. The following report is submitted as requested by reference (a). Tests were conducted, in conjunction with Mark 7 Mod 3 arresting-gear programs, to determine the feasibility of using the British-type wire supports in place of the spring-leaf-type supports presently used on board ships. Results of the tests indicate the British-type wire supports are unacceptable in their present configuration.

DESCRIPTION OF TEST EQUIPMENT

2. Three pairs of the wire supports, manufactured in accordance with British Drawing NA/D77948, were provided by NAEL(SI). Each assembly is comprised of a flat rectangular steel base and two inclined, trapezoidal shaped, polyurethane blades. The blades are mounted on the sides of the steel base as shown in enclosure (1). The steel base is not symmetrical, in that one end is steeply inclined and the other end is blunt. A separate wood ramp assembly is butted against

Each transmittal of this document outside the agencies of the U. S. Government must have prior approval of COMMANDER, NAVAL AIR SYSTEMS COMMAND.

Report No: NATF(SI)-R1

the blunt end and is protected by a steel surface plate that is screwed to the wood. The polyurethane blades were manufactured by the Aeronautical Materials Laboratory of compounds designated AML compound number 1763 (color coded brown), AML compound number 1860 (color coded red), and AML compound number 1861 (color coded blue) with Shore A Durometer hardnesses of approximately 90, 97, and 70 respectively.

3. The wire supports of red polyurethane AML compound number 1860 were installed approximately 15 feet to each side of the runway centerline, with the short, steep slope on the approach side of the Mark 7 Mod 3 arresting system (this was considered to be the most severe condition). The wire supports of blue and brown polyurethane did not support the deck pendant to the minimum 2-inch height required by Mark 7 Arresting Gear Service Bulletin 195.

TEST RESULTS AND ANALYSIS

4. After the wire supports were installed, a series of retraction tests was conducted. During these tests, the pendant rode smoothly and easily to the top of the supports, and after several oscillations, during which the pendant traveled the full length of the support, it came to rest in the center of the polyurethane blades at a height sufficient to assure pendant pickup.

5. During this program, 327 ON-CENTER arrestments of A-3 and A-4 aircraft were conducted. After each arrestment, the returning aircraft was taxied over the pendant support.

a. During the initial series of arrestments and taxi-overs, the supports were monitored for any immediately evident adverse wear characteristics. No adverse wear characteristics occurred as a result of the arrestments; however, A-3 and A-4 aircraft tire damage occurred after only a few roll-overs. The damage to the A-3 tires was restricted to gouging of the tread area, while one A-4 tire sidewall was severely cut, enclosure (2).

b. Several attempts were made to impact the pendant supports with the aircraft hook point. During the first of these attempts with an A-3 aircraft, the arresting hook impacted the steel base and tore the pendant support from the deck. (Damage to the pendant support is shown in enclosure (3).) The damaged pendant support was reconditioned and both supports were reinstalled (180° from the original installation) with the long tapered wooden ramp on the approach side. During a later attempt with the A-3 aircraft, a large section of one of the polyurethane side plates was torn off as shown in enclosure (4). The wire support, however, was still usable despite the missing section.

c. The continued oscillations of the deck pendant over the approach ramp during retraction wore off the heads of the screws that hold the metal protection plate to the wooden approach ramp. This allowed the protection plate, now retained at the approach end and free at the other, to act as a spring, which can cause the hook to jump over the pendant.

d. In addition, after a total of 327 arrestments, the supports allowed the pendant to sag to a point where it was necessary to insert a tire under the pendant to assure pendant pickup,

6. The pendant wire supports have been removed from the runway and NAEL(SI)-designed polyurethane wire supports, PN 613572-4, are being installed for test.

CONCLUSIONS

7. The wire supports are very susceptible to damage and exhibit short service life. (Paragraphs 5b and 5d)
8. The wire supports cause severe tire damage. (Paragraph 5a)

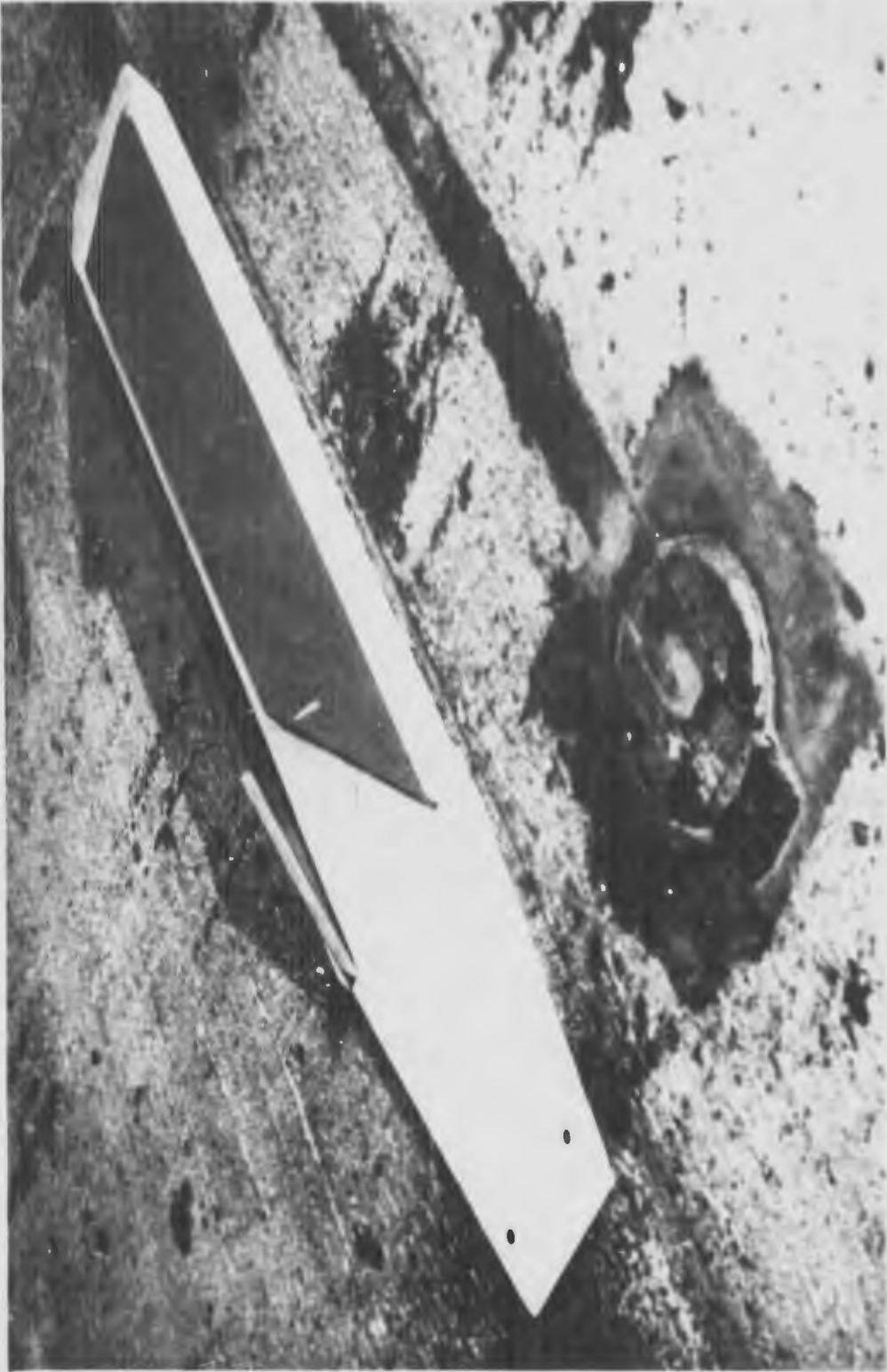
RECOMMENDATIONS

9. Further development of these wire supports be discontinued.

DISTRIBUTION

CNO (Op03EG)	(2)
DDC	(20)
NAVAIRSYSCOM (AIR-604)	(2)
NAEL(SI)	(2)

B. F. Kolacz
B. F. KOLACZ
By direction

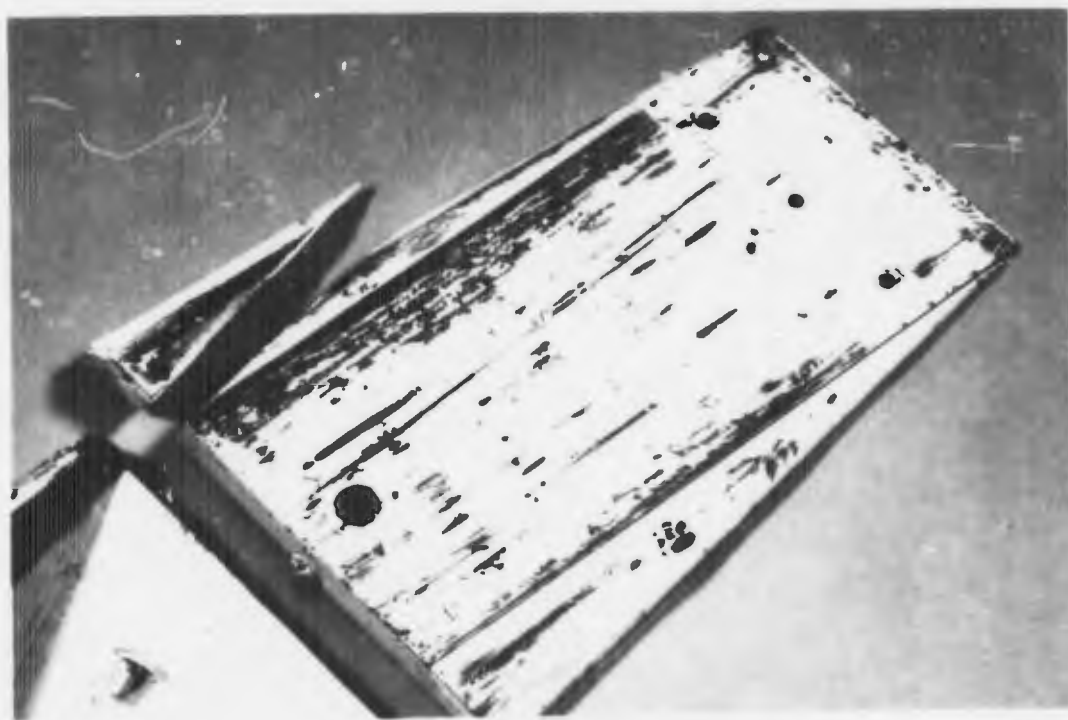
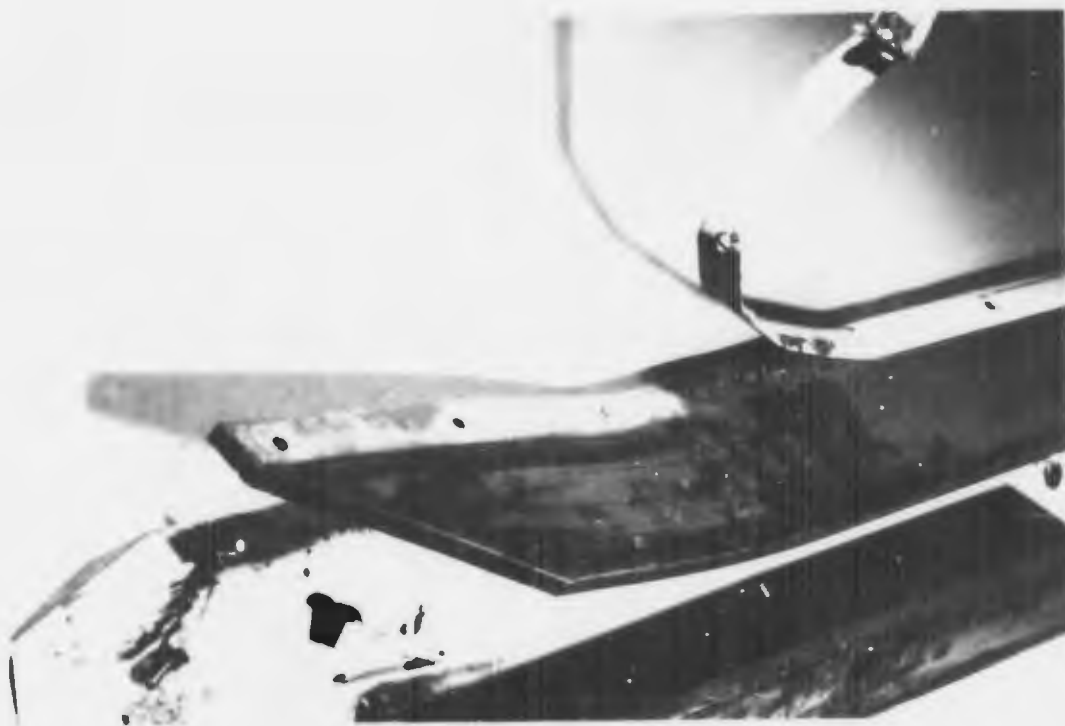


INCLOSURE (1) - BRITISH-177 WIRE SUPPORT TEST D IN CONJUNCTION WITH
MARK 3 MOD 3 ARRESTING-GEAR PROGRAMS



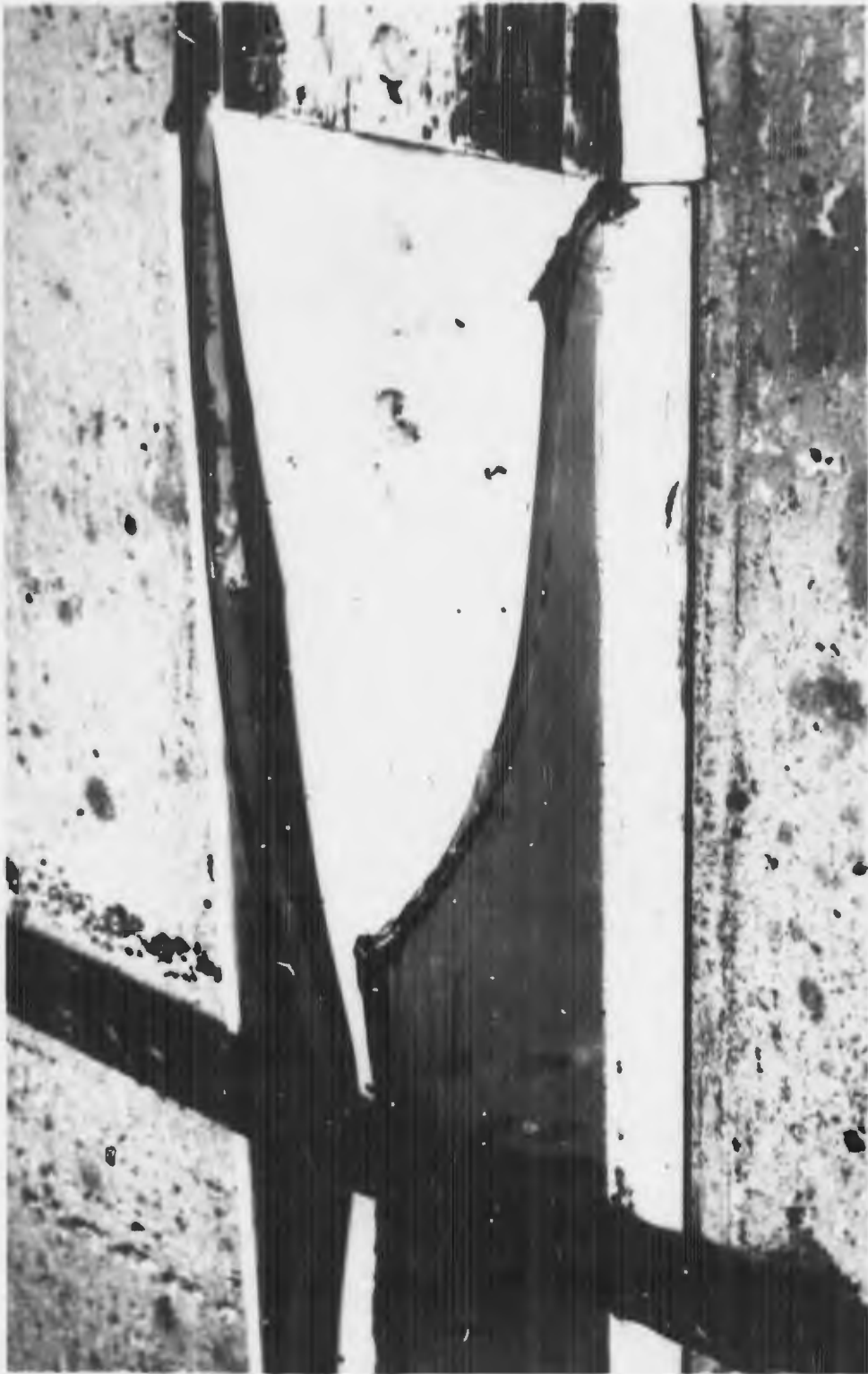
ENLARGED
VIEW OF
CUT

ENCLOSURE (2) - VIEWS OF A-4 AIRCRAFT TIRE CUT WHILE TAXIING OVER
BRITISH-TYPE WIRE SUPPORT



ENCLOSURE (3) - VIEWS OF BRITISH-TYPE WIRE SUPPORT DAMAGED BY
ARRESTING-HOOK IMPACT

REPORT NO: NATF(SI)-R1



ENCLOSURE (4) - BRITISH-TYPE WIRE SUPPORT DAMAGED DURING "HOOK-DOWN"
ARRESTMENT OF A-3 AIRCRAFT