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UNCLASSIFIED
McDonnell Aircraft Corp., St. Louis, Mo. (Report 2497)
Ram Jet Helicopter Development - Progress Report 65 - Month of Jan 1952
Wood, C. R., Jr. 15 Feb'52 10pp photos
USAF Contr. No. AF82(638)-9845
Helicopter. rotors, Jet  Rotating Wing Aircraft (34)
Engines, Ramjet - Performance  Drive System (6)
Testing facilities -  Aerodynamics
H-50
PROPELLER LABORATORY

MCDONNELL Aircraft Corporation
ST. LOUIS 3, MISSOURI

PROGRESS REPORT 65

MONTH OF JANUARY 1952

RAH JET HELICOPTER DEVELOPMENT

SUBMITTED UNDER Contract AF 33(618)-9545

PREPARED BY C. C. Wood, Jr.

APPROVED BY A. C. Ballower

Enclosure 11
Ref: 246-366-2374
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The higher thrust, larger 872-inch diameter ram jets required for flight test program with the 27-foot diameter rotor are 50% completed. The jets are scheduled to be available to start the program in compliance with Items 5 and 6 of subject contract late in March. The modified design for the second 27-foot rotor is in compliance with Item 6 of subject contract was submitted to NORTH on 25 January 1959.
2. Rotor Development

2.1 No. 1, 27-Foot Diameter Rotor

Re change

2.2 No. 2, 27-Foot Diameter Rotor

2.2.1 The modified design of the second 27-foot diameter rotor was submitted to NAEC on 15 January 1952. The basic changes were:

2.2.1.1 The removal of the spar derrick channel and substitution of an internal service compression member.

2.2.1.2 The increase of the trailing edge main gap.

Successful structural tests have been made on samples of the new design (NAEC Drawing 22-19203). A set of blades NAEC-financed, is currently under construction.

2.2.2 NAEC's letter dated 30 January 1952, with reference to the construction of the second 27-foot diameter rotor, is being studied and a letter reply is being prepared.
3. 0.71-INCH DIAMETER Fan JETS

The structural re-design of the 0.71-inch diameter fan jets was completed in January. Two out of the new fan jets is scheduled to be available for test tests on the 27-foot diameter rotor tests in March. Flight tests in compliance with Item 5 and 8 of subject contract are scheduled upon completion of the wind tests.

The estimated required procedure for the design and fabrication of two out of structurally improved 0.71-inch fan jets is:

- Stress Analysis
- Weights and C.G. Determination
- Preparation of Drawings
- Re-work of Test Jets
- Static Testing (Free-air Jet)
- Repair and Re-work of Available Jets
- Windtunnel Test of Jets
- Preparation of Inconel "X" Tensile Test Specimen
- Ignition Development and Re-work
- Fabricate New Set of Jets
- Third Test of New Jets
- Temperature Survey and Data Analysis
3.1  Whirl Test High Speed Photographs

High speed photographs were taken of the ram jet exit during whirl test operations, Endcourses (1) through (5). They show that the exit deflection during the whirl test without a permanent modification in the exit shape. The measurements of ram jet exits during whirl tests are scaled off the enlarged prints and may reflect errors due to printing, paper stretching, or in measuring the print.

3.2  Modified Whirl Stand

The NAC-financed single blade hub tester and the modified whirl test stand reported in Progress Report No. 69 for August 1951, to approximately 90% complete.
4.0 XR-20, USAF 46-689 and 46-690

4.1 XR-20, No. 1, USAF 46-689

No change.

4.2 XR-20, No. 2, USAF 46-690

No change.

5.0 DAILY FLIGHT SHEETS - XR-20 Flight Test Data

There were no scheduled flights during January 1952.

6.0 WORK PROGRAM FOR FEBRUARY 1952

The increased thrust 8.71-inch diameter ram jets are scheduled for completion late in March 1952.
FIGURE (1)  TEST 8.71-INCH DIAMETER RAM JET  STATIC ON WHIRLSTAND

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PAGE 6
FIGURE (2)  
TEST 8.71-INCH DIAMETER RAM JET  
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AT 418 RPM ON WHIRLSTAND  
PAGE 7
FIGURE (3)  TEST 6.71-INCH DIAMETER RAM JET  REPORT NO. 2497

AT 425 RPM ON WHIRLSTAND  PAGE 8
FIGURE (4)

TEST 8.71-INCH DIAMETER RAM JET

AT 462 RPM ON WHIRLSTAND
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