

UNCLASSIFIED

AD NUMBER

AD047361

LIMITATION CHANGES

TO:

Approved for public release; distribution is unlimited.

FROM:

Distribution authorized to DoD only;
Administrative/Operational Use; 01 OCT 1954.
Other requests shall be referred to Navy Bureau
of Ships, Washington, DC 20360.

AUTHORITY

navy, 1 apr 1968

THIS PAGE IS UNCLASSIFIED

Armed Services Technical Information Agency

Because of our limited supply, you are requested to return this copy **WHEN IT HAS SERVED YOUR PURPOSE** so that it may be made available to other requesters. Your cooperation will be appreciated.

AD

47361

NOTICE: WHEN GOVERNMENT OR OTHER DRAWINGS, SPECIFICATIONS OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE U. S. GOVERNMENT THEREBY INCURS NO RESPONSIBILITY, NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS, OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

Reproduced by
DOCUMENT SERVICE CENTER
KNOTT BUILDING, DAYTON, 2, OHIO

UNCLASSIFIED

INTERIM DEVELOPMENT REPORT

IDR 358-7

Copy No. 3

47501

AD NO. 47501
ASTIA FILE COPY

INTERIM DEVELOPMENT REPORT

FOR

RADIO SET AN/URC-8

1 October 1954

Navy Department
Contract NObsr-63161

Bureau of Ships
December 23, 1952

**FURTHER DISSEMINATION IS AUTHORIZED ONLY TO
MILITARY AGENCIES.**

COLLINS RADIO COMPANY

C E D A R R A P I D S , I O W A , U . S . A .

Report No IDR-358-7
1 October 1954

INTERIM DEVELOPMENT REPORT
FOR
RADIO SET AN/URC-8

This report covers the period from 1 July 1954 to 30 September 1954

PREPARED BY

E. W. Schmitt
Project Engineer

APPROVED BY

E. W. Pappenfus
Head, Department VI

Walter B. Jones
Development Contract Director
By Direction of Insp of Naval Mat

Report of progress under Contract NObsr-63161, December 23, 1952
Navy Department, Bureau of Ships, Electronics Division

A PUBLICATION OF
THE RESEARCH AND DEVELOPMENT LABORATORIES

COLLINS RADIO COMPANY
Cedar Rapids, Iowa
FURTHER DISSEMINATION IS AUTHORIZED ONLY TO
MILITARY AGENCIES.

ABSTRACT

This report contains a description of the present status of the development of the AN/URC-8. In particular, it relates to the status of construction of the prototype model and to the status of tests on the engineering model.

INTERIM DEVELOPMENT REPORT

RADIO SET AN/URC-8

PART I

A. PURPOSE

The purpose of the development work contained in this and following reports is to provide a rugged and reliable receiving and transmitting equipment. Simplicity of maintenance and operation consistent with dependability will be the determining factor in making many of the design decisions.

B. DETAIL FACTUAL DATA

1. AN/URC-8 Receiver

(a) Construction of the developmental model was completed.

(b) Testing of the development model has proceeded through the period. Many circuit refinements have been incorporated in the model based on test results and final design work.

Results of internal heat rise tests of the model are in close agreement with initial design calculations.

Temperature and humidity tests have been made on all critical parts and subassemblies, providing data for compensation.

The developmental model is not fully temperature compensated, and over-all performance tests have not been made at ambient extremes. At room ambient, the model essentially meets or surpasses nearly all specification requirements including setting accuracy, sensitivity, signal-to-noise ratio, and audio characteristics.

(c) A second developmental r-f module is nearly completed, and a front view is shown in Figure 1. This module will replace the initial module for the completion of developmental model tests. It contains a new set of r-f variable-pitched coils of final design, and employs the slug-rack mechanism designed during the period.

Tracking tests will be made with this module since the new r-f coils have excellent linearity.

(d) Final design, including fabrication drawings, for the prototype model receiver is nearly complete as of this report. Many parts are being fabricated.

The electrical block diagram remains the same as shown in the preceding report except that a type OA2 regulator tube has replaced the OD3.

Final electrical design has concentrated on optimizing circuit performance and screening parts and assemblies for reliability.

The possibility of using two tuned circuits ahead of the r-f amplifier (and eliminating the 2nd r-f amplifier), based on overload considerations, has been investigated and a report will be available shortly.

Although final performance data will not be available until the completion of prototype tests, a comment on the setting accuracy is added here. Due to the nature of the 100 kc marker calibration system, the percentage setting accuracy of the receiver improves with frequency. This provides the desirable characteristic of a more constant setting accuracy, in terms of kc, throughout the tuning range. Under all, including the most adverse conditions of temperature and cumulative tolerances, the receiver is expected to meet or exceed the setting accuracy specification at the higher frequencies. At the lower frequencies the setting accuracy is expected to be within 1.5 kc at environmental extremes.

Final mechanical design has concentrated on ease of receiver maintenance. Important features are:

- (i) The layout of all modules has been modified for maximum accessibility of parts. The r-f module will have a plug-in injection coil sub-assembly.
- (ii) Front panel knobs quickly disengage from modules by lifting a lever and pulling knobs forward.
- (iii) Modules will have handles and guide-pins for easy removal and insertion.
- (iv) All frequently used fastening screws will be captive.

2. AN/URC-8 Transmitter and Power Supply

- (a) The completed prototype model of the transmitter's variable inductor assembly is shown in Figure 2.
- (b) The completed prototype model of the a-c power supply is shown in Figure 3.
- (c) Type testing of the engineering model of the transmitter and a-c power supply is approximately 85% complete. All bench tests, temperature tests, and humidity tests have been completed. Spurious radiation checks are presently being conducted. Tests on radiated and conducted noise have as yet not been initiated.

Results of tests have been encouraging. Any revisions which have been found to be necessary as a result of these tests are being included in the construction of the prototype model.

PART II.

A. PROGRAM FOR NEXT INTERVAL

1. Receiver

- (1) Final design for the prototype model receiver will be completed.
- (2) Tests of the development model will continue, using the new r-f module, until the prototype model receiver is constructed.
- (3) The prototype model is scheduled for completion by the end of October.
- (4) Following initial testing of the model, it will be tested under Navy supervision during November.

2. AN/URC-8 Transmitter and Power Supply

- (1) The engineering model type test will be completed.
- (2) The construction of the prototype model of the transmitter will be completed.
- (3) By the end of the next reporting period it is presently expected that the type test of the prototype model will be complete to the extent that the only test remaining will be the 21-day accelerated life test.

Legend:



Work Completed



Schedule of Projected Operation

- PD — Preliminary Design
- FD — Final Design
- MD — Model Delivery Period
- T — Test

Period covered 7/1/54 to 9/30/54

1953

1954

J P M A M J J A S O N D J F M A M J J A S O N D

2. Receiver

R-V Unit

PD

FD

MD

T

I-F Section

PD

FD

MD

T

Audic Section

PD

FD

MD

T

M.C. Unit

PD

FD

MD

T

Power Supply Unit

PD

FD

MD

T

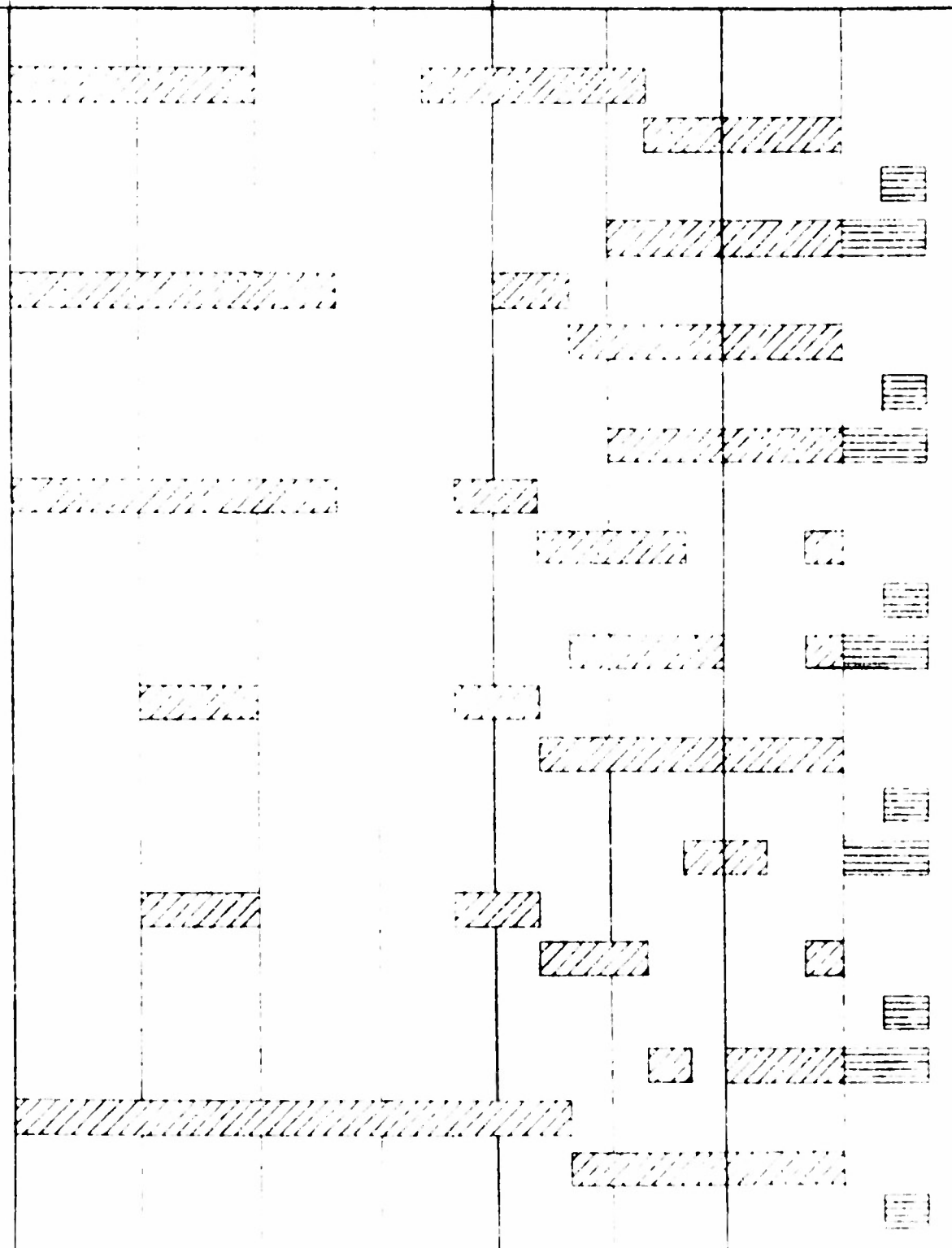
Panel, Frame and case

PD

FD

MD

T



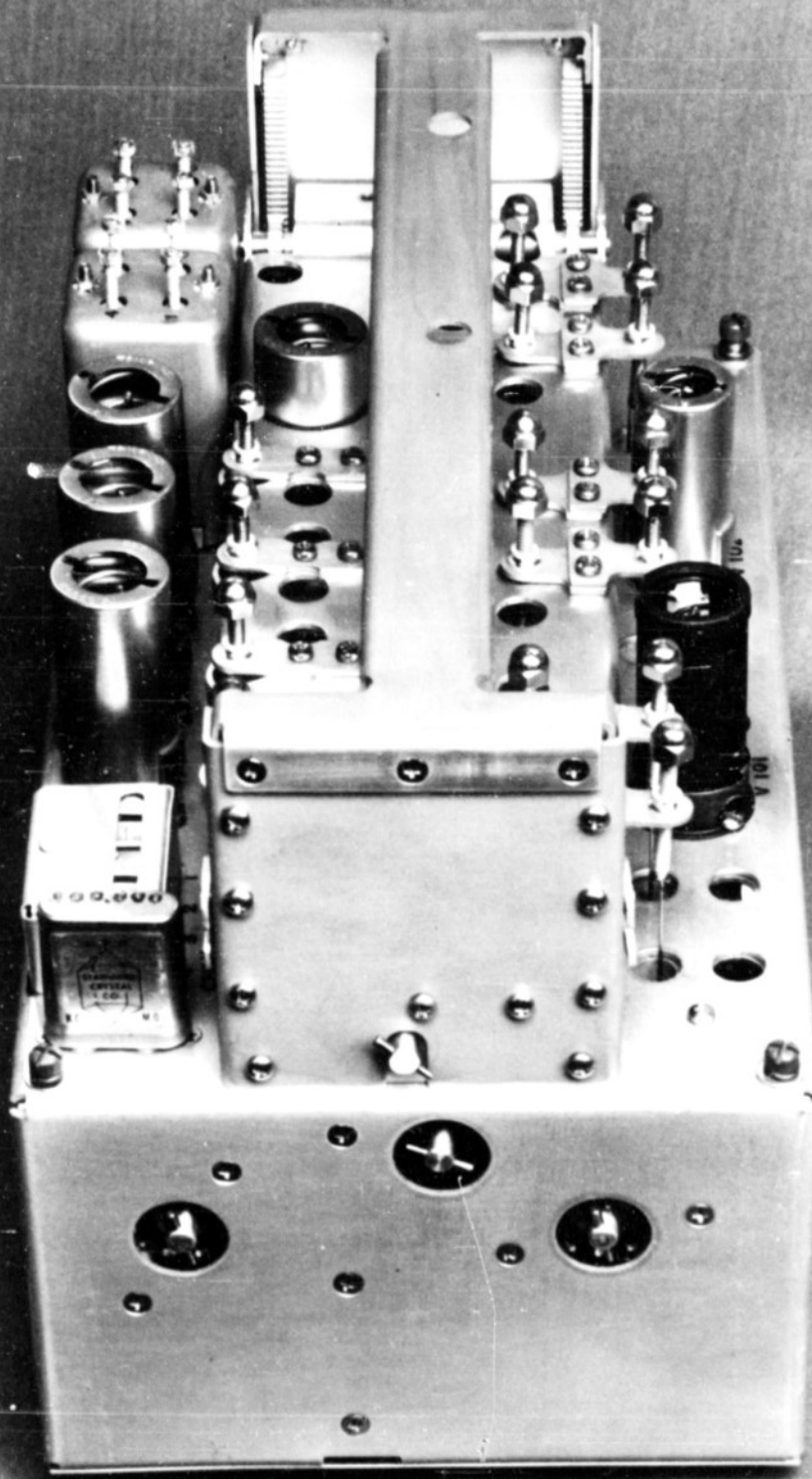


Figure 1. R. F. Module

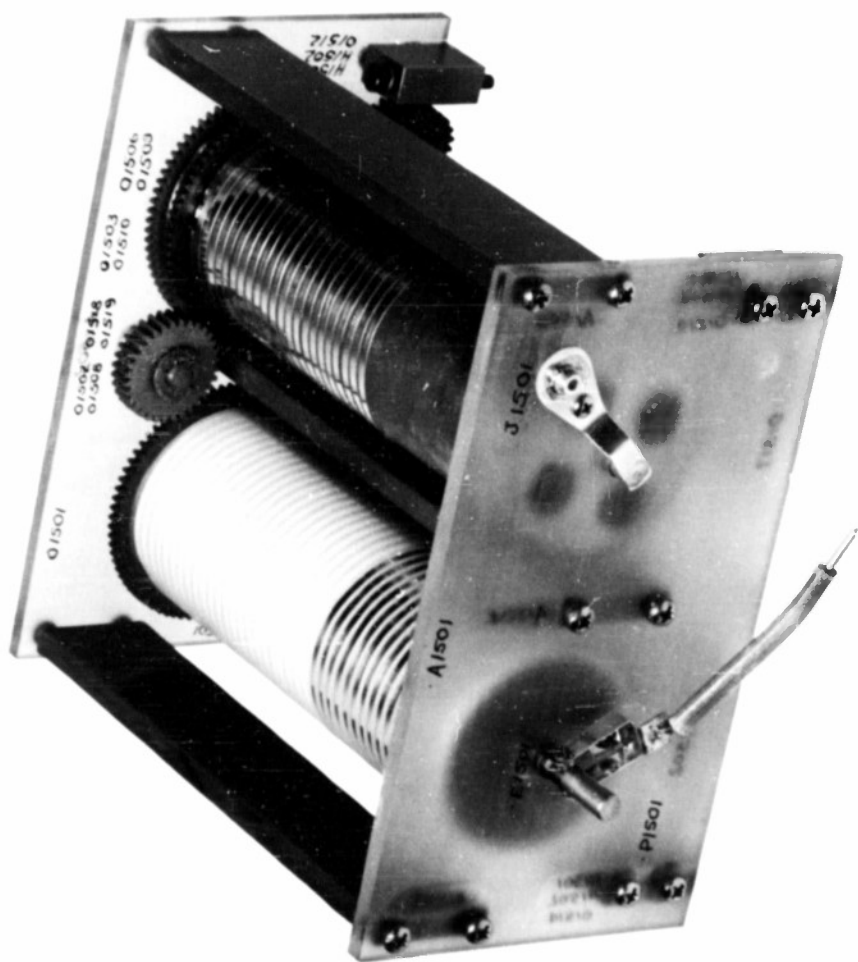


Figure 2. Variable Inductor Assembly

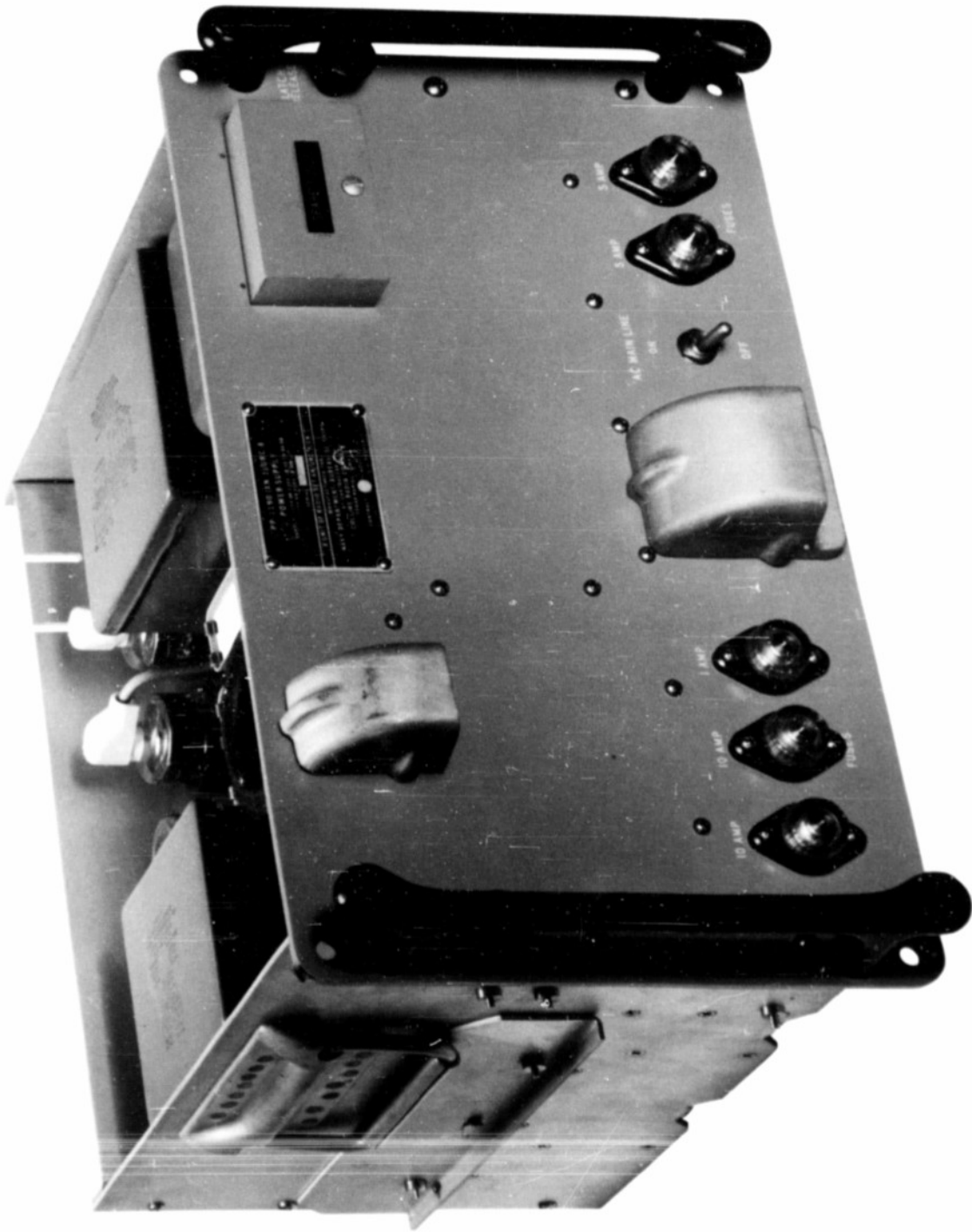


Figure 3. AC Power Supply

Armed Services Technical Information Agency

Because of our limited supply, you are requested to return this copy WHEN IT HAS SERVED YOUR PURPOSE so that it may be made available to other requesters. Your cooperation will be appreciated.

AD

47361

NOTICE: WHEN GOVERNMENT OR OTHER DRAWINGS, SPECIFICATIONS OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE U. S. GOVERNMENT THEREBY INCURS NO RESPONSIBILITY, NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS, OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

Reproduced by
DOCUMENT SERVICE CENTER
KNOTT BUILDING, DAYTON, 2, OHIO

UNCLASSIFIED