Chapter No.

A1  The Work of the Aerospace Structures Engineer.

STATICALLY DETERMINATE STRUCTURES

(Loads, Reactions, Stresses, Shears, Bending Moments, Deflections)

A3  Properties of Sections – Centroids, Moments of Inertia, etc.
A4  General Loads on Aircraft
A5  Beams – Shear and Moments.  Beam – Column Moments.
A6  Torsion – Stresses and Deflections.

THEORY AND METHODS FOR SOLVING STATICALLY INDETERMINATE STRUCTURES

A9  Bending Moments in Frames and Rings by Elastic Center Method.
A10 Column Analogy Method.
A11 Continuous Structures – Moment Distribution Method.
A12 Slope Deflection Method.

BEAM BENDING AND SHEAR STRESSES.
MEMBRANE STRESSES.  COLUMN AND PLATE INSTABILITY.

A13  Bending Stresses.
A14  Bending Shear Stresses – Solid and Open Sections – Shear Center.
A15  Shear Flow in Closed Thin-Walled Sections.
A16  Membrane Stresses in Pressure Vessels
A17  Bending of Plates.
INTRODUCTION TO PRACTICAL AIRCRAFT STRESS ANALYSIS

A19 Introduction to Wing Stress Analysis by Modified Beam Theory.
A20 Introduction to Fuselage Stress Analysis by Modified Beam Theory.
A21 Loads and Stresses on Ribs and Frames.
A23 Analysis by the “Method of Displacements.”

THEORY OF ELASTICITY AND THERMOELASTICITY

A24 The 3-Dimensional Equations of Thermoelasticity.
A25 The 2-Dimensional Equations of Elasticity and Thermoelasticity.
A26 Selected Problems in Elasticity and Thermoelasticity.
FLIGHT VEHICLE MATERIALS AND THEIR PROPERTIES

B1 Basic Principles and Definitions.

STRENGTH OF STRUCTURAL ELEMENTS AND COMPOSITE STRUCTURES

C1 Combined Stresses. Theory of Yield and Ultimate Failure.
C2 Strength of Columns with Stable Cross-Sections.
C3 Yield and Ultimate Strength in Bending.
C4 Strength and Design of Round, Streamline, Oval and Square Tubing in Tension, Compression, Bending, Torsion and Combined Loadings.
C5 Buckling Strength of Flat Sheet in Compression, Shear, Bending and Under Combined Stress Systems.
C6 Local Buckling Stress for Composite Shapes.
C7 Crippling Strength of Composite Shapes and Sheet-Stiffener Panels in Compression. Column Strength.
C8 Buckling Strength of Monocoque Cylinders.
C9 Buckling Strength of Curved Sheet Panels and Spherical Plates. Ultimate Strength of Stiffened Curved Sheet Structures
C10 Design of Metal Beams. Web Shear Resistant (Non-Buckling) Type.
   Part 1. Flat Sheet Web with Vertical Stiffeners.
   Part 2. Other Types of Non-Buckling Webs.
C11 Diagonal Semi-Tension Field Design.
   Part 1. Beams with Flat Webs.
   Part 2. Other Types of Non-Buckling Webs.
C12 Sandwich Construction and Design.
C13 Fatigue.

CONNECTIONS AND DESIGN DETAILS

D1 Fittings and Connections. Bolted and Riveted.
D2 Welded Connections.
D3 Some Important Details in Structural Design

Appendix A Elementary Arithmetical Rules of Matrices.