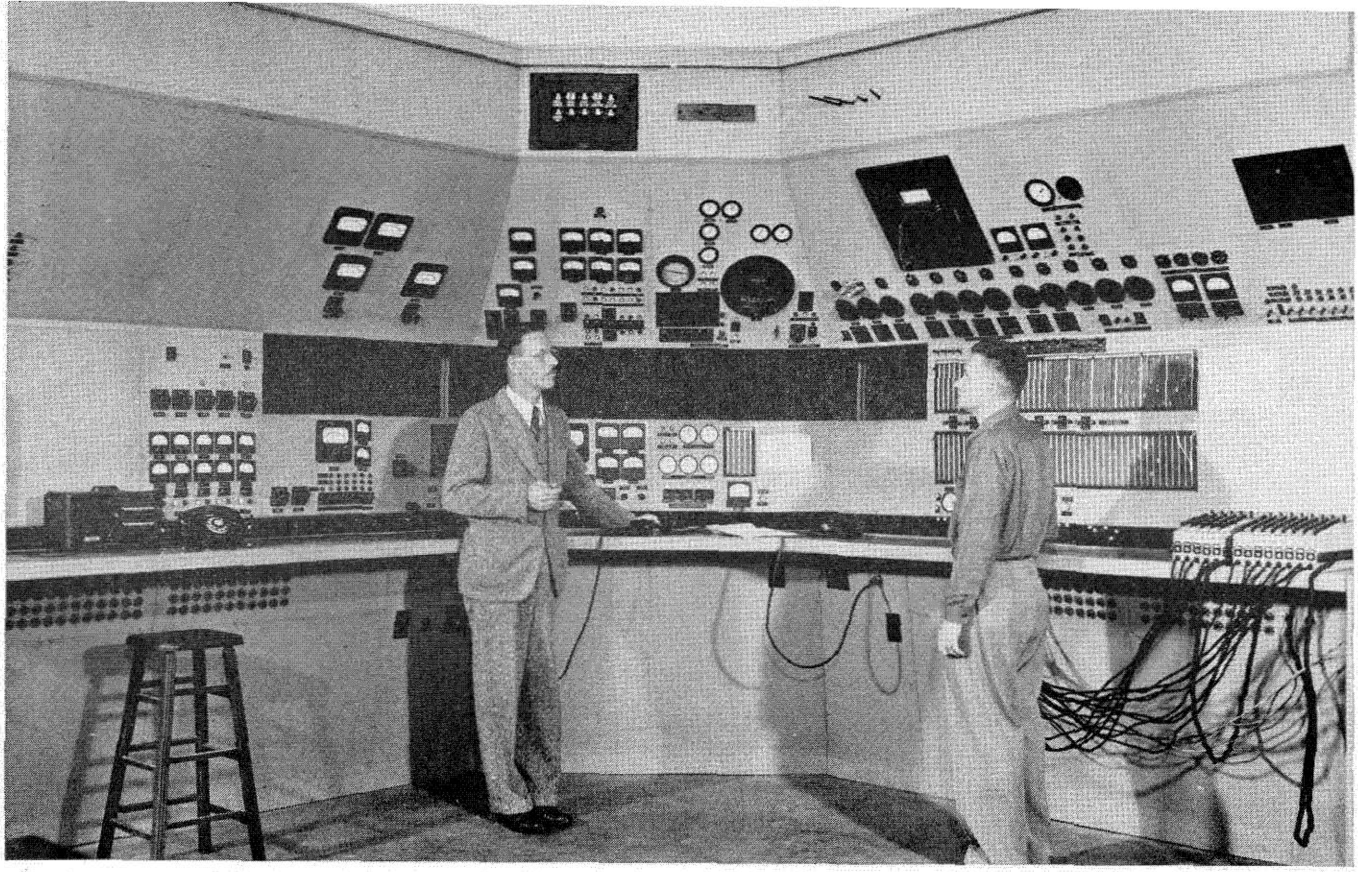

FIG. 2. Console of control room, which provides centralized operation by means of remote control and indication circuits.

INTRODUCTION

THE Southern California Cooperative Wind Tunnel is an achievement remarkable not only for its technical features, but perhaps even more significantly for the concept of cooperation upon which it is based, and which is emphasized in its name. Under the impetus of wartime necessity, the traditionally highly competitive aircraft industry, through joint and closely cooperative action, astounded the world by "achieving the impossible." With the coming of peace, the competitive spirit, with its emphasis on individual initiative, will return to the industry.

Even under peacetime competition, however, there are certain fields of activity in which joint action is so intrinsically desirable as to justify its permanent incorporation in the aeronautical industry. One of the most important of these fields is that of research and development, involving particularly the highly complex facilities required for the analysis and solution of the difficult problems encountered in the development of modern, high-speed aircraft.

The Cooperative Wind Tunnel provides such a facility. It is a $2,500,000 project, financed and owned by four Southern California aircraft companies—Consolidated Vultee Aircraft Corporation, Douglas Aircraft Company, Inc., Lockheed Aircraft Corporation and North American Aviation, Inc.—and operated by the California Institute of Technology. Under the cooperative arrangement, these four aircraft companies thus continue in peacetime to employ the most important elements of wartime cooperative development, while retaining the advantages of the flexibility and initiative of private ownership and management. The Cooperative Wind Tunnel represents a highly significant and valuable experiment in cooperative organization on the part of one of the nation's great industries.

The wind tunnel was originally conceived as a design instrument for use by airframe manufacturers in carrying out the aerodynamic development of current and new aircraft. The design was jointly supported by the cooperating Southern California companies and the Curtiss-Wright Corporation, which is constructing an essentially identical wind tunnel. It had to satisfy a number of very special requirements: Size had to be such as to make the construction of complete airplane models relatively simple. Operating conditions had to cover speeds up to the velocity of sound, and also scales, or Reynolds Numbers, as large as possible. Accuracy had to be extremely high, and the time required to make the tests and obtain complete data had to be held to the absolute minimum. Wide flexibility was required in the type of test which could be conducted, and the transition from tests on one project to those on another had to be rapidly and easily made. The tunnel, therefore, has many new features which are justified by and can only be understood and appreciated in the light of these very special requirements.

GENERAL FEATURES

THE general arrangement of the Cooperative Wind Tunnel is shown in *Fig. 1*. The heavily reinforced steel tube, seven-eighths inches in thickness, is of circular cross-section and is sheltered by a reinforced concrete and frame building. The maximum inside diameter of the tunnel is 31½ feet, while the working section is 12 feet wide and eight and one-half feet high. A bank of vanes is provided at each corner to guide the airflow smoothly around the turn. This is shown in the cutaway of the turn at the right of *Fig. 1*. The control room is on a mezzanine above the second floor, shown in the lower left portion of *Fig. 1* and in *Fig. 2*.

At the upper left of the control room in *Fig. 1* are shown two partitioned model rooms with wood and metal shops immediately adjoining. The engineering offices, drafting room, photographic laboratory, technical library and other work rooms are on the first floor. The model is mounted within the decompression sphere shown at the