THE WARTIME RECORD AND POST-WAR FUTURE OF PROJECTION AND SOUND EQUIPMENT*

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Summary.—*This paper is a case history of the manufacture and distribution of 35-mm motion picture projection and sound equipment under wartime restrictions as imposed by War Production Board regulations. It tells about the difficulties and problems which were encountered and overcome so that the Armed Forces might obtain all of the equipment needed, with a limited quantity for our civilian theaters. The paper also discusses the reasons why our manufacturers cannot now produce as much new equipment as will be needed for replacements, and makes recommendations for future planning.*

Every person in the motion picture industry will remember the uncertain status of all manufacturers and distributors of projection and sound equipment, repair parts, and accessories soon after the Pearl Harbor disaster. We had a war on our hands.

The War Production Board in Washington, D. C., was the one war agency charged with the responsibility of conserving vital materials, labor, and plant facilities so that the Armed Forces could have full and uninterrupted access to the productive capacities of every industry. Motion picture projection and sound equipment, like many other commodities so necessary to our commercial and industrial development, quickly became a wartime casualty. Certain conservation and limitation orders issued by the War Production Board prohibited the manufacture of projection and sound equipment except that which was needed to fill orders for the Armed Forces.

At the beginning of World War II our military minds worked quickly and thoroughly to overcome the difficult problems of training the staggering number of men needed for combat duty. They did not have enough skilled instructors available for the training of such large forces of men who were inducted into the different armed services. Naturally, their attention was drawn to the use of motion

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picture projection and sound equipment, from which was created many ingenious synthetic training devices.

Some of our manufacturers were called upon to work with the Ordnance Department of the U. S. Army, and the Department of Special Devices, Bureau of Aeronautics of the U. S. Navy, in the development of many different types of synthetic training devices through the use of the standard types of equipment which each manufactured. These amazing devices, after having been put into use in the training programs, saved millions of dollars in ammunition and guns and countless lives in the vigorous training campaigns.

The Armed Forces needed standard types of equipment for other training purposes. Army training centers and Navy shore stations were provided with equipment for specialized training courses in all phases of military activity. The equipment was also used for the showing of films produced especially for the Medical Corps illustrating proper surgical, first aid, and other techniques. Aside from the technical uses of the equipment, motion pictures were the only form of entertainment available in many military installation and training centers. They had a morale job to take care of and "movies" played a most important part.

The reputation of our manufacturers for the production of precision parts spread to the Army and Navy material procurement staffs. The Army and Navy could not produce in their own plants the precision equipment and instruments required. Consequently, they had to turn to plants with known reputations for the production of precision equipment. The production of motion picture equipment for the most part requires precision manufacturing within tolerances of $^{1}/_{10,000}$ of one inch and many manufacturers were given contracts for certain high precision combat instruments.

This meant expansion of plant facilities, the installation of new and intricate machine tools, and the training of operators to handle the tools. And yet, we could not stop production of our standard types of sound and projection equipment because the Armed Forces also needed that class of equipment.

Industry manufacturers had a difficult problem to crack in getting as much equipment as required because of the high priority war work they were doing on direct war material. It then became the job of the War Production Board to correlate the activities of all the manufacturers of projection and sound equipment into one co-ordinated function. If the Armed Forces needed projection and sound equip-

ment, they needed it complete in every detail, even though many of the different units were being manufactured in different plants in many different cities. Their program could not be carried out if everything was ready for installation except the lamp houses, or the sound system, or even a pair of lenses. Everything had to be delivered on time. The War Production Board scheduled the production of every unit of equipment needed by the Armed Forces in such a manner that all units arrived at their destination on time, notwithstanding that the manufacturing cycle extended from 3 months on lamp houses to 12 months for sound equipment.

Because of the demands of the military on the productive capacities of the equipment manufacturers for their normal product and military items, the motion picture industry faced a tremendous task in keeping its theaters in operation. The production of almost every item of equipment needed had been stopped, including projection and sound equipment, *etc.* Repair parts for sound and projection equipment could not be purchased because production of them had likewise been stopped.

What could be done to relieve the distress of the motion picture industry? The answer could not be readily reached because all of our industrial resources were geared to war production. We hardly dared to suggest a solution which, in any manner, might interfere with the delivery of military goods. Yet, here was an industry which by its limitless energy was selling more war bonds, collecting more money for the Red Cross, and doing a bigger job of prosecuting the war effort generally than any other single industry. Copper, rubber, paper, tin, and aluminum were collected. Millions of dollars were spent through the War Activities Committee to make each co-operating venture a success from which the only return was the satisfaction that the industry was doing its level best to help win a war. These accomplishments could not be continued unless the theaters could continue to operate. They needed repair parts, accessories, and a limited amount of new equipment to make the more urgent replacements of equipment which could no longer be economically repaired or efficiently maintained.

The industry tightened its belt and learned for the first time the true meaning of maintenance, improvising, and substituting. Theaters patched and reversed their carpets, spent countless hours welding and nursing their auditorium seats. Some of their customers steamed and sweated in the summer because air-conditioning plants could not

be repaired or Freon was not available. Some patrons practically froze in their seats for two winters because fuel was not available, or the heating plant could not be repaired. But the industry operated just the same because it still had pictures on the screen and they did talk!

The supply dealer soon became the theater owners' best friend and confidant because he still had a few repair parts and a little new equipment on hand in the early months of the war. If he did not have the necessary parts, he would rush emergency equipment to the theater. The supply dealer was his own rationing board so far as his rapidly dwindling stockpile of new equipment was concerned, and he parceled out that new equipment only when its installation became the factor between closing down or continuing to operate a theater. He took pride in his part of the job, in return for which he received the overwhelming thanks of the theater owner.

By April, 1942, the importance of the motion picture was firmly established with the top officials in Washington. The War Activities Committee of the Motion Picture Industry had been organized, the leadership of which was vested in the biggest and most resourceful men in our business. They brought the efforts of the industry to the attention of men like WPB's Donald Nelson, Secretary of the Treasury, Henry Morgenthau, Jr., and Secretary of Commerce, Jesse Jones. President Roosevelt knew what was happening in our business. The industry received immediate recognition of its efforts and the Amusement Section of the War Production Board was subsequently established, later changed to the Theater Equipment Section.

In August, 1942, R. J. O'Donnell of the War Activities Committee asked me to accept an appointment to the War Production Board as a Consultant on problems relating to the production and distribution of motion picture equipment in general, which appointment was accepted with humility and a deep sense of responsibility.

Our immediate problem was the production of repair parts for projection and sound equipment. In October, 1942, the Iron and Steel Order and the Copper Order were each amended to provide for the production of repair parts. Priority regulations, however, made it necessary at that time for theater owners to furnish their supply dealer with a priority rating for delivery of a part. We needed accessories, such as rewinders, reels, change-over devices, film cabinets, *etc.* We needed a limitation order which would permit the production of repair parts and accessories, and which could be carried in

stock by supply dealers and sold without priority ratings. We needed a WPB instrument by which we could schedule production and regulate distribution of a limited quantity of new equipment then urgently needed to replace worn-out or burned-out equipment.

Because of these circumstances, the WPB deemed it desirable and necessary that jurisdiction over the sound and projection equipment industry should be placed in one Industry Division, and that control over the production and distribution of projection and sound equipment be co-ordinated into one limitation order. Therefore, Limitation Order *L-325* was prepared and issued so that the necessary demands of the Armed Forces and of the civilian theaters might be met, and yet to provide that there shall be no interference in the production of actual war goods.

Under the terms of that order enough new equipment was scheduled for manufacture to make urgent replacements in civilian theaters. Dealers' stocks of repair parts and accessories were gradually replenished and sold without restrictions.

The credit for the orderly and continued operation of the motion picture theaters belongs to no one individual. The success of our business during the war years can be attributed to a combination of ideals and ideas contributed by the War Activities Committee, the manufacturers and distributors of projection and sound equipment, the Society of Motion Picture Engineers, the projectionists, the officials of the War Production Board, and countless others.

Now that the war is over doubtlessly most of us face the immediate future production of sound and projection equipment with undue optimism. There are 17,000 theaters in the United States, which figure represents only a small percentage of the theaters in the world. Our manufacturers must not only now plan to produce enough new equipment to meet a pent-up demand in the United States of 4 years, but they will also be called upon to fill orders for equipment to rehabilitate theaters in bombed-out areas and for thousands of new and modern theaters which will be built in nearly every foreign country in the world.

Naturally, our manufacturers will build equipment to fill domestic orders first, at least enough to make the immediate and urgently needed replacements, and for new installations. Some new equipment will be exported because it is good for our business to have American made projection and sound equipment in use in foreign theaters. Our manufacturers must protect their foreign markets.

It may also be expected that some of the better used equipment which is replaced by new equipment in the United States will be rebuilt and restored for export, thereby making more new equipment available for domestic installations.

If we look at cold and practical figures, we get a startling picture of the job our manufacturers face. We require in the United States annually approximately 4500 standard projectors, 2250 standard sound systems, 6200 arc lamps, 4500 rectifiers, and 1000 motor-generator sets. We also need nearly 1500 of the portable types of 35-mm sound projectors. Multiply these figures by the pent-up demand of 4 years, and we have a need in the United States for 18,000 projectors, 9000 sound systems, 24,800 arc lamps, 18,000 rectifiers, and 4000 motor-generator sets. We will need 6000 of the portable types of sound projectors. Only approximately 50 per cent of one year's production has been manufactured under wartime restrictions for non-military uses since 1942, and considerably fewer motor-generator sets were produced since 1942.

How can our manufacturers meet this demand for new equipment within a reasonable length of time? It is not an easy job for several reasons. Before the war, when materials and components flowed freely, the production cycle ranged from 3 to 10 months, depending on the class of equipment produced. That can be cut in the near future because new and better machine tools will be available. Our manufacturers have the "know-how" of mass production of precision instruments, a technique acquired during the war years.

The time when our manufacturers will be delivering equipment in large quantities will depend greatly upon the availability of parts and components which they must buy elsewhere. They now must wait for other manufacturers to convert their facilities to meet our own specifications for such necessary parts as ball bearings, fractional horsepower motors, indicating meters, a host of electronic parts, switches, *etc.* Foundries must be geared to make the precision castings we now need. Lumber in large quantities will be needed for shipping boxes. It will take time to train the additional skilled labor needed for such expanded production.

Theater owners should consult their supply dealers and evaluate their equipment requirements now. The dealer was most helpful during the war years, and you may need his friendly co-operation and expert advice now more than ever. He might suggest the installation of a third projection unit, an emergency rectifier, or motor-generator

set, or dual amplification for your sound system. The demand for so much new sound and projection equipment now would not be so great if such installations had been made before the war. It is insurance well worth the additional costs, and theater owners should look forward to the future when new equipment will be available in greater quantities so that such emergency equipment can be purchased.

Until new equipment is generally available to all who need it, we should not relax our efforts to keep in perfect repair the equipment we must continue to use for the time being. The theater patron demands perfect projection and sound, and by continuing to keep our present equipment properly maintained, we reduce the basic causes of dangerous and costly film fires, and thus keep faith with the public.