PROJECTOR FOR NAVY

During the war years, the Teletype R&D engineers encountered some unusual problems. Early in the war a group of three navy officers visited Teletype. With a requirement for maximum secrecy, they told us that the Navy was converting a large tanker, which was under construction, into a ship for carrying and operating airplanes. It would support an airstrip from which planes could take off and land. Flight crews would assemble below this deck and come up to board the airplane when it was in place, warmed up, and ready for take off. With planes taking off and others on warm-up, there would be a lot of noise, making it impossible to use voice for directing flight personnel. They asked if we could supply a teletype with a projector and screen so that information could be shown to a group of pilots seated before the screen. There would be four such "ready-rooms" on the ship. This project was assigned to my group and I gave the navy representatives a qualified yes answer, suggesting that we start with a crude mock-up which would make it easier to establish a specification. This was accepted, but we were asked to bring the mock-up to Washington for review by a larger group. The importance of time was emphasized.

One of our machine designers Erwin Gubisch was also an optician and designed an optical system using an objective lens from a conventional projector. The standard paper roll was replaced with a roll of transparent cellophane. A 3-foot square projection screen was found. A local mirror shop cut two special shaped mirrors for us. Using the factory maintenance facilities, we built a "cabinet" of 2"x 2" wood pieces for the framework and a cardboard type of wallboard for panels. The mock-up was assembled in sections, the sections being joined with screws for takedown and reassemble. In less than two weeks we had completed an operating mock-up. A.S. Benjaman, the Teletype chief sales engineer and I took the "model" to Washington.

We found that the Navy had rented the ballroom of a hotel for the conference and with help from our Washington office staff, we had the system operating and ready for the next day conference.

Navy personnel arrived early and continued coming until we had about one hundred present. We kept the equipment operating, answered questions, received advice and listened. The visitors milled about, formed small discussion groups, discussed and debated until about noon when they left. We then met with our navy hosts. They told us they wanted to order four units. We asked if they would draw up a specification and were told "you heard it". They explained that the first carrier, named the Lexington, was an experimental project and that we should just do our best. We received basic information on floor to ceiling clearances, size of openings through which the equipment had to pass, pitch and roll maximums, etc.

We returned home and went to work on a "production" design. The maximum roll specification was a 45° slant from vertical. The 15 printer typing carriage, weighing about five pounds, had to travel uphill at a 45 degree angle and then go back downhill at a 45 degree angle. Both ways the machine failed. The problem was solved by adding a dummy carriage at the rear of the machine, traveling in a direction opposite to that of the actual carriage and functioning as a counter weight. The unit was split into two rectangular parts, the lower standing vertical and the upper lying horizontal upon it. The large mirror was attached to a steel frame, which in turn was mounted with three support points to withstand twisting. Two-sheet safety glass was used with the mirror coating in the middle. The lower part had a sturdy angle iron frame, which could be bolted or welded to the deck. Rubber mountings were also supplied. Side attachment places were provided so that the frame could be attached to a bulkhead. Throughout, the design was as flexible as possible to meet unforeseen conditions.

An order for four units was received. These were completed and shipped. We waited for trouble reports but none came. Orders for additional units in groups of four were received and this continued during the whole war period and for several years after. There were no troubles reported and the original design was never changed.