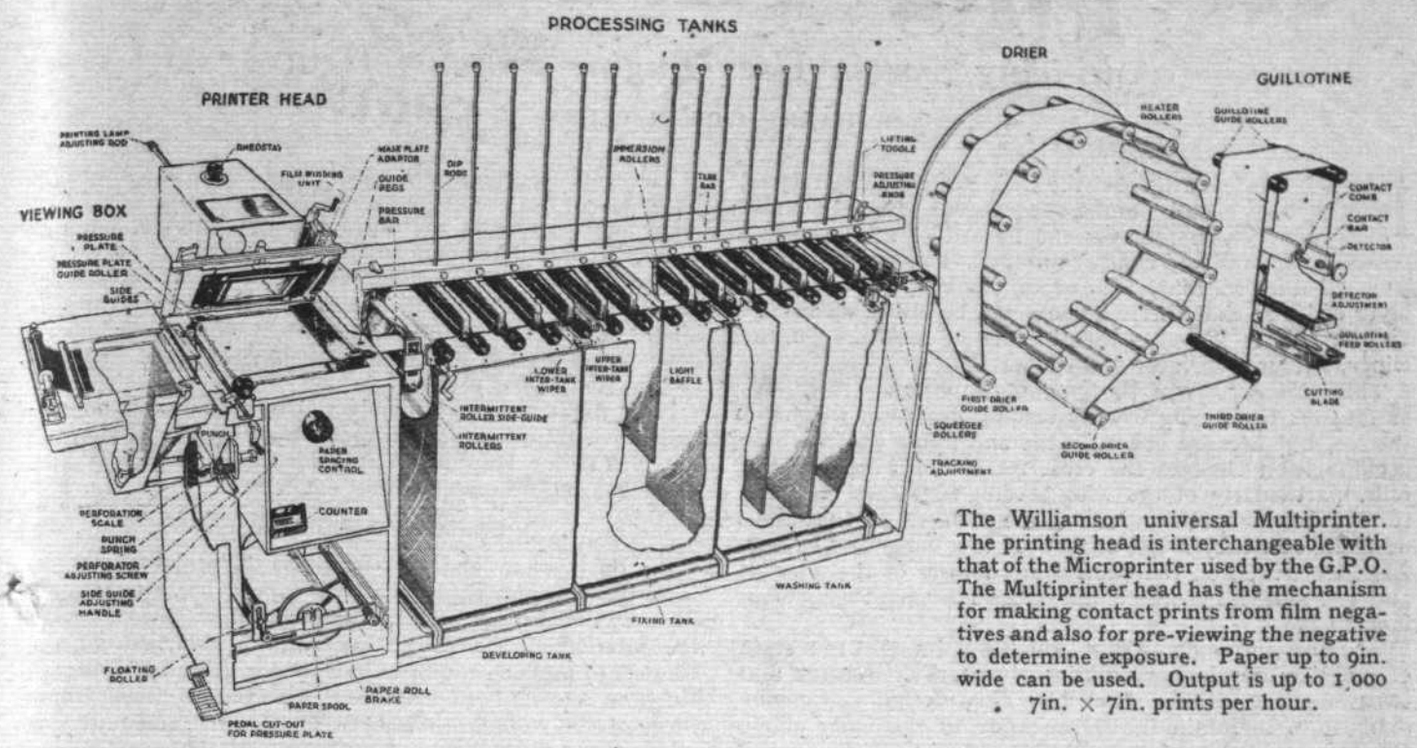
MICROGRAM SERVICE



The Williamson universal Multiprinter. The printing head is interchangeable with that of the Microprinter used by the G.P.O. The Multiprinter head has the mechanism for making contact prints from film negatives and also for pre-viewing the negative to determine exposure. Paper up to 9in. wide can be used. Output is up to 1,000 7in. × 7in. prints per hour.

gained and providing for the production of a larger and faster Microprinter, specially designed for the purpose in view. Williamsons' design to this specification was approved early in 1941 and work was commenced immediately on a sample model.

Coincident with this action, the Air Ministry decided that the Service requirements called for a machine with a larger capacity than the 5in. × 5in. capacity of the earlier machine. Since the processing and drying requirements of the two Services were identical, Williamsons proposed that a universal machine should be produced with interchangeable printing heads suitable to the individual requirements of each Service. It was agreed that this should be done, and the two complete machines are now in full production, the one used by the R.A.F. being known as the Multiprinter, and that used by the G.P.O. as the Microprinter.

These machines are the result not only of Williamsons' many years' experience combined with that of the G.P.O. and the R.A.F., but also incorporate Mr. Ellis Graber's 30 years' experience with this type of apparatus.

In the consideration of the design of a machine suitable for the two Services, many points had to be considered, not the least being the fact that many of the Multiprinters are installed in vehicles, to form mobile photographic units for the R.A.F., compelling every detail to be studied to withstand vibration in transit.

1,000 Prints per Hour

Paper up to 9½in. wide can be used, and the output ranges from 450 to 800 feet per hour, according to requirements. A steady output of 1,000 7in. × 7in. prints can be maintained per hour.

In the Multiprinter the printing head incorporates the necessary mechanism to perform repeatedly the functions required to make contact prints from film negatives, together with means for previewing the negative in order to assess the exposure required. Incidentally, the mechanism is totally enclosed in an "oil bath" gear box which would do justice to a small car, and is certainly more complicated. The paper is also perforated at each exposure for the purpose of operating a cutter after the drying operation, whereby cut prints are delivered from the machine.

In the Microprinter head the fact that the paper is travelling continuously means that the driving mechanism is extremely simple, and the main points of interest are concerned with the projector head.

The first series of Microprinters followed the lines of development initiated by Messrs. Gill and Paul, wherein the film projector was mounted above the paper, projecting vertically downwards. The magnification required of 8—1 naturally resulted in the projector head being mounted some distance above the paper feed rollers, and solution of the inherent problem of producing an accurate and lasting transmission system, free from any minute irregularity between paper and film, is an essential requirement if definition is not to suffer.

Ensuring Good Definition

Experimental work on this question persisted, and many methods were tried before the present patented method was designed. In this the paper feed roller and the film sprocket are mounted on one shaft, the diameter of the former being eight times the latter, and the projected image of the film is diverted by two surface-silvered mirrors so as to return on to the paper roller. The projector follows orthodox lines, with a 250-watt projector lamp condenser system and projection lens. The film passes over a curved track at the gate, a condition which is permissible without affecting flatness of field owing to the small amount of film (less than one-tenth) which is projected. A Dallmeyer 2in. focus f/3.5 enlarging lens is used for projection. In the Post Office experiments a Goertz-Elmar had been used, and some doubts were expressed as to whether the optical perfection of this lens could be repeated, but Dallmeyers' confidence in their products has been substantiated by the results obtained.*

It is hoped that this important application of the photographic process to the requirements of war will have peacetime uses. Much credit for the development of the system and the equipment must go to Mr. Paul and Mr. Gill, of the G.P.O. Research Station, who have worked on the transmission of mail by photographic means, without publicity, and who have given great help in the production of the Williamson Microprinters now coming into active service.

* Due credit must be given to Chance Brothers who supplied the high-class optical glass required by Dallmeyer.