

## X-RAYS for Drug Detection

Standing in Perth Customs parcels post office surrounded by banks of mailbags, Leon Tate's practised eye roves over the thousands of articles that arrives daily from overseas. Most are ordinary letters, papers or parcels with nothing more sinister in them than private correspondence or personal gifts. Some, on the other hand, are not what they seem.

Leon Tate is Sub-Collector at the parcels post office and in 27 years with Customs he has seen all kinds of attempts to mail illicit goods into Australia. He picks up one parcel put

aside for checking. It contains an ordinary-looking child's panda doll. He takes the doll to a piece of apparatus, places it in the aperture and peers through a special viewing eyepiece. An image on the screen inside tells him all is not well. A closer check of the doll brings to light the cause of Leon's concern – a tiny packet of cannabis resin hidden inside.

The apparatus on which he tested the doll is his own brainchild, developed over years of study and experiment. It is described as a fluoroscope – an X-ray machine capable of checking all but the largest mail packages or the thinnest of letters.

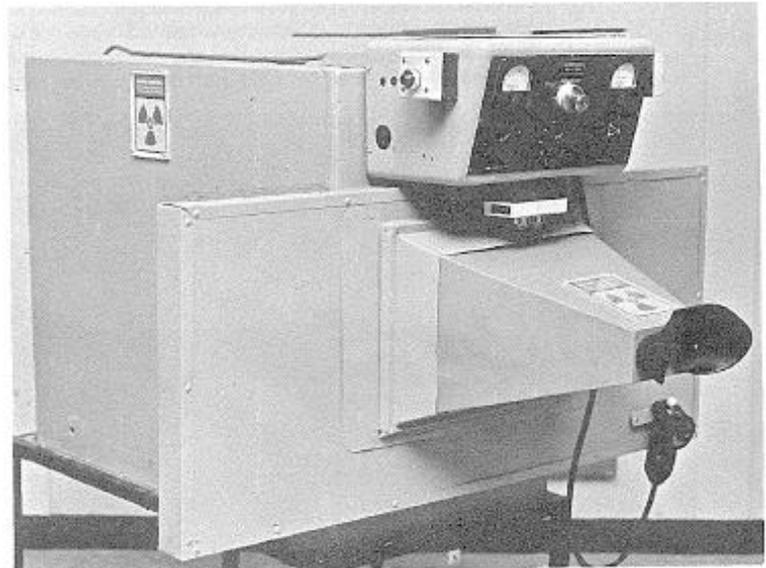
Leon Tate built up the apparatus over a period of several years to fill what he considered to be a vital need in customs work. His equipment has justified the work put into it and has now aroused interest at home and overseas. In Hong Kong, the Preventive Service part of Customs is building four of the machines for its own use. Firm inquiries also have come from Bangkok, source of much of today's drug trafficking. At home the WA State Police are now using a device for bomb searches which is based on Leon Tate's design.

The Tate device weighs about 200kg but is mounted on a trolley for convenience. Its vital operating part is a sandwich-like section with an aperture large enough to take envelopes, parcels and other objects. A Bakelite fluorescent screen and lead-filled glass enables the immediate reproduction of an image of whatever the package contains. A trained observer is able to readily identify vegetable material, metal or wood particles.

The fluoroscope can scan up to 300 objects an hour and is capable picking out small amounts of drug, no matter how cleverly disguised. Surprising that such a capable piece of equipment could have the simple beginning's it had.

During the 1939-45 War Leon Tate joined the RAAF and became a radar navigation officer attached to the RAF in the United Kingdom. His work with the RAF earned him a selection to a posting attached to the Free French Air Force and there he trained two bomber

*The Tate fluoroscope, developed to intercept letter bombs, is now being used successfully in the search for illicit drug imports.*



squadrons in the air use of radar. It was from this war-time radar experience that he developed an interest in the theory behind it. It was the horrifying 'Black September' letter bomb incidents of 1972 that turned his mind back to the war years. He sought assistance from Royal Perth Hospital to help the search. Through the Hospitals co-operation, a primitive medical X-ray fluoroscope was made available.

It was used initially in screening mail for letter-bombs, but a series of experiments showed there were other uses for the equipment in mail checking. The apparatus was returned to the Hospital after 10 months of steady and successful use. Twelve months later Leon Tate was commissioned to design and have built his first fluoroscope. The budget was small but with the help of the electronics industry and Commonwealth and State authorities, the first machine was completed. It proved very successful in locating plant material such as drugs as well as metal and plastic objects.

Improvements followed, including a variable generator which allowed adjustments of X-ray strengths to achieve the best results, and the fitting of a letter carrier – a belt which runs through the machine at a speed of one metre per minute. It was a much more sophisticated machine now.

Leon Tate believes the success of the device can be attributed to the use of medical equipment which emits 'soft' rays. These rays, unlike the 'hard' rays used in the more powerful industrial equipment, do not completely penetrate drugs, giving a far more satisfactory image. The device is ideal for use with mail because, although the rays pick out vegetable and other material, they do not show up handwriting.

One of the factors uppermost in the development of the apparatus is safety. Every safety precaution required by law has been built in. In many cases the requirements have been exceeded, both for operators and the goods being examined. So far, the apparatus has built up an impressive list of finds which otherwise probably would not have been made. These vary from jewellery and gems to large amounts of drugs concealed in rolled newspapers, hollowed-out books or statues and ordinary letters. The equipment also has proved a time saver in enabling parcels to be checked without opening them.

The Tate fluoroscope is an example of on-the-job motivation and innovation which has resulted in the provision of an impressive and successful piece of equipment to the Customs fight against drug smuggling.



*X-Ray Scanner for Drugs  
Developed after a number of Prototypes, by Customs  
Officer Leon Tate in 1976. By the late 1970's the  
machines were installed at Major Postal Control Centers  
around Australia*