

## ANTI-COLLISION COLOUR SCHEMES

by Trevor W. Boughton.

In the July issue of the Journal (page 54), a note was published concerning the new colour scheme for non-operational RAAF aircraft. It is therefore thought that the following notes concerning the development of anti-collision colour schemes in Australia will be of interest to members. While many applications of fluorescent paint have been made, only a few of these have been made with air safety as the main object. Most of the others are "gimmick" applications.

The use of fluorescent colour schemes was originally developed in the U.S.A. in an attempt to overcome excessive loss of life in air accidents. Between 1949 and mid-1958, more than 300 persons were killed in air accidents, the majority of them being in the latter half of the period. Public clamour forced an urgent programme of investigation and, arising from this, two important safety aids were developed. They were the use of high-intensity flashing light beacons and special high visibility colour schemes. Experimental work performed by the Civil Aeronautics Administration (CAA) showed that, by choice of a suitable colour scheme, it was possible to "see" an aircraft for a much longer period in almost all weather conditions than one which had not been painted. A C.A.A. DOUGLAS DAKOTA had its fuselage nose, wing tips and tail unit painted with orange fluorescent paint, and a black outline was used to further highlight these areas. On the wing tips three orange and two broad black bands were used.

About one month after the C.A.A. announced the results of their work, the Australian Department of Civil Aviation (DCA) began similar experiments with AUSTER J/5G CIRRUS AUTOCAR VH-CAM. During December, 1958, VH-CAM had its nose, tail unit and wing tips painted a semi-matt dark red, the rest of the aircraft remaining silver. While this was not a true fluorescent paint, it nevertheless made the AUSTER easier to see and soon other aircraft began to appear with fluorescent colour schemes.

The value of such a scheme as a factor in air safety was further highlighted during February and March, 1959, when two USN "Deep Freeze" aircraft visited Australia. First, and undoubtedly the more impressive of the two, was the LOCKHEED R7V-1 SUPER CONSTELLATION Bu131624 "Phoenix" which was polished natural metal with a very dark grey cabin top and fluorescent orange tail unit and wing tips. The second aircraft was the personal transport of Rear-Admiral G.J. Dufok, then in command of operation "Deep Freeze", a DOUGLAS R5D-3 Bu56528 which was painted similarly to "Phoenix". It was possible to observe both aircraft for extremely long periods, for when they exceeded the range of normal vision it was possible to follow their movement by observing a moving orange blob on the horizon.

Ansett-ANA officially took delivery of their first BELL 47J RANGER VH-INR on 13<sup>th</sup> January, 1959, and its external colour scheme was white, dark blue, and fluorescent pink. RANGERS VH-INE and INF have been similarly painted and the previously-mentioned high-intensity light beacons

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have also been installed. Because of their shape, helicopters are very difficult to paint in a satisfactory safety colour scheme and, in many conditions, the flashing light is a more effective safety aid than the fluorescent paint.

Trans-Australia Airlines announced on 18<sup>th</sup> February, 1959, that they intended to paint certain areas (fin, rudder and wingtips) of their aircraft with orange fluorescent paint as a safety precaution. Commenting on this decision, a member of Ansett-ANA stated that his company would not follow suit because all modern safeguards had been applied to their aircraft. At this stage, TAA's decision appeared to be a "gimmick" but subsequent events have proved otherwise. In addition, it would have been a very expensive gimmick as the paint used by TAA, which is known as blaze orange <sup>(1)</sup>, is quite costly. VICKERS VISCOUNT VH-TVI "Matthew Flinders" was the first to be painted but, after two days of service, an argument with a hail storm reduced its pristine beauty. VISCOUNT VH-TVN "William Dampier" was the second to be painted, and since then most of the fleet have followed. Initially a standard colour scheme was not in force but this has now been remedied. FOKKER FRIENDSHIP VH-TFB "Abel Tasman" and LOCKHEED ELECTRA VH-TLA "John Eyre" were the only examples of the new equipment to arrive wearing pre-fluorescent colour schemes. When the new colour scheme was first propounded a life of 15 to 18 months was envisaged, but after several aircraft had been in service this estimate was revised to about 10 months. In many cases this reduction was caused by strong sunlight encountered on the Queensland routes. FRIENDSHIP "Abel Tasman" entered service on 1<sup>st</sup> May, 1959, and had been repainted by 6<sup>th</sup> December, 1959 - a life of about seven months.

Qantas Empire Airways tried a pink <sup>(2)</sup> fluorescent paint on the wing tip tanks of LOCKHEED L1049G SUPER CONSTELLATION VH-EAO "Southern Aurora" but little, if any, further application has been planned.

Despite the extremely efficient methods of air traffic control employed by DCA there is always the latent danger of collisions. In this respect it would seem that slow flying aircraft have much to gain by correct application of fluorescent paints. In some cases it has been applied with safety considerations in mind, but in many cases not. The Illawarra Flying School, Royal Victorian Aero Club and Royal Aero Club of New South Wales have used it on various aircraft such as AUSTER J1 VH-AMK and CHIPMUNK VH-AKW (Illawarra) and CHIPMUNK VH-RVR (RVAC), both orange as used by TAA whereas RACNSW uses a pink colour akin to that of Ansett-ANA. Numerous private aircraft have also been painted such as the COLONIAL SKIMMER VH-ARB (pink trim on white fuselage and blue wings), AUSTER J1 VH-AYJ (white with pink trim on fuselage and spats) and PROCTOR 3 VH-BPR (orange rudder and pants).

Many photographers have experienced difficulty when photographing these colour schemes. In many cases the only answer is to use the minimum exposure and hope. Sunny conditions seem to give the best results, but acceptable results have been obtained with colour film on a very dull day.

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The above article refers to the July issue of the Journal (page 54). The text of that reference is as follows:

Painting of non-operational aircraft of the RAAF with flame orange fluorescent paint has commenced. It will be applied to the upper and lower surfaces of the tips of the wings and tailplane, noses, and fins, and, in general, the paint will be carried on static metal surfaces but will not be employed on movable fabric control surfaces. The red, white and blue flashes at present painted on fins will be carried on rudders. At W.R.E., it was found that JINDIVIKS which were painted flame orange were tracked more easily. Twelve months ago, a VAMPIRE and a WINJEEL at RAAF Station, East Sale, were marked with the paint and it was found that they were more readily observed than aircraft with a conventional paint scheme. DAKOTAS and BEAVERS of the Antarctic flight have already carried the flame orange paint for this reason. Use of the paint overseas has resulted in a marked decrease in mid-air collisions and "near-misses".

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#### NOTES

1. The colour was more correctly described as Fire Orange although Flame and Blaze have been used also.
2. Photographic evidence suggests that the colour used by Qantas was Fire Orange.