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Captain Michael Gitt Papers - The Airline Pilot (ALPA Newsletter), 1949-1964

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[[image. caption: FLIGHT RECORDER TAPE shown above gives an idea of the size of a tape section and, to some degree, the mutilation with which officials must contend when making a readout.]]

of sea water immersion and be reproducible. The recording of time must be done in intervals of one minute, and must be accurate within one percent in eight hours. Altitude must be recorded at least once per second from an altitude of -1000 to 50,000 feet, accurately varying from +/-100' on the -1000 foot level to +/-700' at 50,000 feet. Vertical acceleration must record from +6 "G"s to -3 "G"s, with an accuracy +/- .2G. A/S must record from 100 to 450 knots IAS, accuracy +/- 10 knots. Although A/S is recorded below 100 knots, it is only reliable from 100 to 450. Heading must record 360 within +/-2.

Recorder Readout

We will now go through a flight recorder readout starting with its pick-up and offer a few suggestions which may be of assistance. Locating the flight recorder involved in an accident has in the past been sometimes difficult. Some have been under water or smashed among the debris, while others have been thrown free and easily found. There are plans for the future to assist investigators in the location of the flight recorders which I'll go into a little later. In the meantime, knowledge of the general location of the FDR installation would help. This information can, of course, be obtained from the airplane flight manual. Some are located in the wheel wells, some in the lower belly, and some in the radio rack. When the recorder is found at an accident, extreme care should be exercised in its handling. The styli usually remain on the foil at impact. This has a tearing effect on the medium and makes it difficult to read. Additional stylus damage can be caused if due care is not used while handling and transporting the recorder.

The recorder should never be opened until a member of the CAB staff is present. Preferably it should be opened in Washington by the Flight Recorder Committee. Sometimes observation of the stylus position and its condition is useful in determining how some unusual traces were made. If an unusual trace is noted, it is hard to find if the trace was made prior to or after impact unless the stylus position and condition can be observed as the foil is removed. We have had some spools that have been knocked off, so improper handling in the field could cause further damage. If the recorder has been torn open by impact and the tape has been scattered, be sure to save every piece of foil found. It may be that under the microscope some useful information can be obtained.

If tape has been scattered, search the area thoroughly to find all pieces. There was an accident in Chicago where the recorder did break open and the tape was shredded and scattered along the flight path. The piece containing the information we were looking for was never found. So after the tape is removed from the recorder, the procedure followed by the CAB Flight Recorder Committee, is to attempt to straighten and/or clean it. Sometimes this requires an annealing process which involves heating the tape to 400 degrees for 20 minutes. This has been done successfully and helps to soften and straighten the tape. After the tape has been cleaned and straightened, as much as possible, it is placed below a piece of optical glass under pressure on the CAB's new readout machine.

Now, a word of explanation about this machine. In the past the Bureau

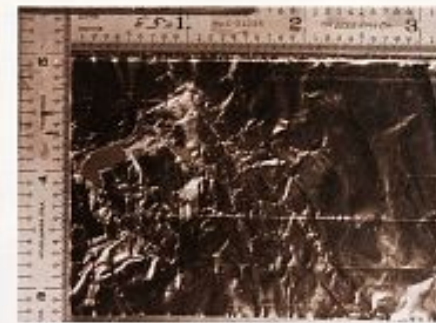
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Now, a word of explanation about this machine. In the past the Bureau of Standards used a far more machine that had measuring accuracy of ten thousandths of an inch, on both an X and Y movement of the foil. This was time consuming and sometimes inconsistent to the Bureau of Standards. The CAB has now purchased their own machine, which has the same accuracy plus the advantage of giving a pictorial display of the X and Y values. This makes it easier and faster to record the value of the data points. Also, in the optical system the microscope through which you look to read the tape, has a viewing screen whereby several persons can observe the information as the operator sees it.

After the tape has been placed in the machine, a check is made to find time movement. This means measuring the distance between the one minute scribe marks to see how far in thousands of an inch the foil advanced in one minute. It is then possible to figure how far the foil advanced in one second. Such information is used later to time all traces before plating. On one particular recorder the stylus traces or paths in their routine processes. To keep the stylus from striking each

PAGE 5

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