

DIALS, AUTOMATIC, No. 30...

Precautions to be Observed when Handling and Storing

1. **General.** This Instruction details the precautions to be observed when handling and storing Dials, Automatic, No. 30..., which is the illuminated dial used on Telephones No. 712 (Triumphone). It has a standard trigger mechanism (see Automatic, B 1003) but differs from the standard type of telephone dial in that it has a moulded transparent finger plate and the dialling characters are illuminated.

2. **Illumination.** The dialling characters are illuminated by a 'Betelight' unit. This consists of a sealed glass tube having an inner fluorescent coating and containing tritium gas. The radioactivity of the gas causes the tube coating to glow. The tube is mounted in a recess in the dial body immediately beneath a translucent number ring. The glow is apparent only when viewed in the dark.

3. **Handling.** To minimize the possibility of breakage of the tubes care must be taken when handling the dials and telephones fitted with them. Replacement of faulty parts should normally be limited to the dial fingerplate and label protector but the number ring may be changed after confirming that the 'Betelight' glows (see par. 6).

4. **Radiation hazard.** The exceedingly small (virtually nil) amount of radiation that penetrates the glass does not present any radiation hazard even when there are a large number of dials present. The amount of radiation escaping is only a small fraction of that permitted from a luminous watch. Single breakages of tubes, even at the rate of one per week, do not constitute a health hazard because natural ventilation will disperse the released tritium.

5. **Storage.** To minimize the hazards from multiple breakages, storage in stores without mechanical ventilation capable of 25-30 air changes per hour must not exceed 100 tubes (i.e. dials, or dials plus telephones) per 1000 cubic feet of free space. The number of tubes that may be stored can be found by subtracting the volume of the available storage space from the total volume of the store, and dividing the answer by ten. Where the store is divided into separate rooms, each room should be considered individually. An emergency procedure should be drawn up locally that can be put into operation in the event of multiple breakages. Dials and telephones should not be stored at heights greater than 2 ft. 6 in. and individual items should always be packaged.

*6. **Procedures in the event of breakage.** A dial which is suspected to have a broken 'Betelight' should be examined in reducing light conditions. Viewing down an opaque tube of slightly larger diameter than the dial is satisfactory. Any dials that do not glow should be regarded as broken. If more than four breakages should occur simultaneously the incident should be reported to the Radiological Protection Officer who will advise on and arrange for any monitoring that may be required. The Radiological Protection Officer is a member of THQ (P&S4.3), London Material Section, London, N.1. Telephone 01-226 1262 Extn. 347.

(a) *Subscribers' premises.* In the event of a dial which does not glow being discovered on a subscriber's premises it should be recovered and returned to the Supplies Divn. clearly labelled 'Dial No. 30 with suspect tube'.

(b) *Breakages indoors.* When breakages occur, or as soon as they are discovered, ventilate the affected area. If the number of dials or telephones involved is greater than four, remove the suspect stock to a well ventilated place, preferably out-of-doors. Inspect the items and report as detailed above.

(c) *Breakages outdoors.* When breakages occur in the open the radioactive gas will be quickly dispersed.

(d) *Breakages in transit.* Ventilate the vehicle and remove the suspect items, inspect the items and report as detailed above.

(e) *Disposal.* The number ring *must not* be removed from a Dial No. 30 which is suspected of having a broken tube, such dials must be returned to the Supplies Divn. securely wrapped and clearly labelled 'Dials No. 30 with suspect tubes', not more than ten dials being enclosed in the one package. When a larger quantity of faulty dials needs to be disposed special arrangements should be made with the Radiological Protection Officer.

(f) *Cuts from broken 'Betalights'.* Fragments of broken tubes can be expected to be contained within the dial. Although the fragments of glass may retain some radioactivity any such fragments can be treated as normal refuse. Should a cut from a fragment of 'Betelight' be suffered the incident should be reported to the Radiological Protection Officer.

7. **Disposal.** Disposal will be normally the responsibility of the Supplies Divn. where small quantities (not more than ten tubes) may be treated as normal refuse but larger quantities will be subject to the advice of the Radiological Protection Officer.

8. **Transportation.** Additional precautions are not necessary to the normal careful handling of equipment to prevent damage in transit. If the total load of dials and/or telephones should exceed 1000 the Radiological Protection Officer should be consulted regarding certain statutory conditions.

9. **Packaging.** Not more than 50 Dials No. 30 should be packaged together in a single container. As the 'Betelight' may be more vulnerable when the dial is not mounted in a telephone, a warning notice should be displayed on the outside of bulk packages of dials: TRITIUM - CONTAINS RADIOACTIVE GAS - EXTERNAL RADIATION BELOW 0.5 MILLIRAD PER HOUR.

Reference:- Automatic, B 1003
(TD2.3.1)

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