



WS No. 19 Mark III

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## SPECIAL VALVES

## MISCELLANEOUS INSTRUCTION NO.1

Care in handlingCrystals

1. Crystal valves as used in the frequency changer stages of U.H.F. equipment use a silicon crystal and a phospher bronze contact arm. Gradual deterioration of these crystals occurs over a period of time. To avoid damage to the crystal, e.g., by displacing the contact arm, they must be handled carefully at all times.
2. In U.H.F. equipments employing instantaneous high voltages, e.g., radar equipment, rapid deterioration and complete burning-out of the crystals used in the ~~frequency-changer~~ stage will occur if the crystals are overloaded. To avoid this occurring the following points must be observed:-
  - (a) Spare crystal valves
    - (i) Never allow the crystal valves to touch any metal part of the equipment. Sparking will occur, resulting in burn-out of the crystals
    - (ii) Never carry the crystal valve about unnecessarily. If the crystal valve is carried through the transmitter beam, it will burn out.
    - (iii) Always keep the spare crystal valves in the packing in which they originally came, where they should be adequately protected from any of the above dangers.
  - (b) Crystal valves fitted into the equipments
    - (i) Never direct the transmitting paraboloid against a large reflecting surface at close range, otherwise the excessively large reflected signal will endanger the crystal.
    - (ii) Never direct the transmitter paraboloid towards the paraboloid of another equipment, because of the danger of receiving the transmitted signal of the other equipment direct.
3. In the case of crystals used in oscillator circuits, their containers are sealed in order to prevent the ingress of extraneous matter. However, it is important that the crystals be kept clean, in a dry place and free from vibration.

Magnetrons, Sutton tubes, soft rhumbatrons and grounded-anode triodes

4. These valves possess metal-glass seals which have to withstand a high vacuum and a certain amount of mechanical stress. Due to their unusual physical construction they must not be laid down on benches, since they will roll and will inevitably be damaged. These valves when not in use will therefore be placed in the containers. When removing the valves from the equipment the following points must be observed:-
  - (a) Always avoid any chance of the filament input or the output pips of the magnetron knocking against any other part of the equipment.
  - (b) When a magnetron is removed from an equipment, it must always be placed in the wooden container provided.

Thyratrons and mercury rectifiers

5. These valves contain a certain amount of liquid mercury which, if deposited on the cathode, will reduce the life of the valve due to the mercury removing the cathode coating. If a valve has been stored upside down, or on its side, it must be treated as follows:-

- (a) A piece of asbestos paper, wadding or cotton wool, will be wrapped round the exterior anode cowl, and the valve run for half an hour with the normal cathode voltage only. After this time, the wrapping should be removed and the H.T. switched on and run up slowly. This complete operation should be repeated up to three times if necessary, thus giving a total of  $1\frac{1}{2}$  hours with filament supply only, before rejection.
- (b) In equipments where provision is made for keeping spare thyratrons warm so that they are available for immediate use, they must always be kept in the correct position on the equipment.

END

R E S T R I C T E D

ELECTRICAL AND MECHANICAL  
ENGINEERING REGULATIONS  
(By Command of the Army Council)

TELECOMMUNICATIONS  
J 249 Misc Instr No 2

SPECIAL VALVES

TECHNICAL HANDBOOK - MISCELLANEOUS INSTRUCTION

Defective valves - manufacturers' investigation

Note: This Issue 4, Page 1 supersedes Issue 3, Pages 1-5 dated 21 May 53 and Issue 1, Pages 0-01 dated 20 Oct 53.

SUMMARY

1. The valve reporting procedure detailed in Issue 3 is no longer required.

ACTION

2. Issue 3, Pages 1-5 dated 21 May 53 and Issue 1, Pages 0-01 dated 20 Oct 53 are hereby cancelled and all copies will be destroyed.

3. This Issue 4 will be retained in the EMER binder as a record.

EME8

57/M/5624

Issue 4, 3 Jan 61

END

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R E S T R I C T E D

ELECTRICAL AND MECHANICAL  
ENGINEERING REGULATIONS  
(By Command of the Army Council)

TELECOMMUNICATIONS  
J 249 Misc Inst No. 3

SPECIAL VALVES

TECHNICAL HANDBOOK - MISCELLANEOUS INSTRUCTION

Redesignation of EMERs

Information

1. To maintain the proper sequence of EMER numbers, it is intended that:-
  - (a) all future issues of EMERs on this equipment will be published in the series Tels J 240 - J 249 and
  - (b) the current EMERs will be redesignated.

R E S T R I C T E D

TELECOMMUNICATIONS

J 249 Misc Inst No. 3

ELECTRICAL AND MECHANICAL  
ENGINEERING REGULATIONSAction

2. The following EMERs will be redesignated as shewn.

Present designation					New designation (e)
	EMER designation (a)	Pages (b)	Issue No. (c)	Date (d)	
1	Tels A 469 Misc Inst No. 1	1 - 2	1	6 Nov 44	Tels J 249 Misc Inst No.1
2	Tels A 469 Misc Inst No. 2	0 - 01 1 - 5	1 3	20 Oct 53 21 May 53	Tels J 249 Misc Inst No.2

57/Maint/6670

END