

COLD CATHODE TUBES CONTAINING RADIUM BROMIDE AND KRYPTON 85 METHOD OF HANDLING

1. GENERAL

1.01 This section covers the handling of specially marked cold cathode tubes containing radium bromide and cold cathode tubes containing krypton 85 which are not specially marked.

1.02 The cold cathode electron tubes listed in this section contains a minute amount of radium bromide or krypton 85 to ensure consistent operation. The material is on the inside of the glass envelope or on the element structure. There is also formed within the tube containing radium bromide a small quantity of radioactive gas (Radon).

1.03 Radium bromide tubes listed in Table A contain 0.5 to 1.0 microcurie of radium bromide and the krypton 85 tubes contain 5 to 15 microcuries of krypton 85. Table A gives the code number for the radium bromide tubes and the replacement krypton 85 tube. The replacements are made to reduce the radiation hazard.

TABLE A

TUBES CONTAINING RADIUM BROMIDE	REPLACEMENT TUBE CONTAINING KRYPTON 85
CODE	CODE
346B	346C
376B	
413A	413B
423B	
430A	430C
5589	

1.04 The radium bromide tubes are marked with a magenta (purplish red), three bladed, propeller-shaped symbol. The containers will be marked appropriately to indicate the need for care in handling.

1.05 Krypton 85 tubes are not specially marked.

1.06 The possible danger to personnel, as a result of radiation, from these tubes under conditions encountered in central offices, is negligible if the methods and precautions outlined in this section are followed.

2. STORAGE

2.01 *Do not* store these tubes within 3 feet of fixed work locations of personnel (desks, testboards, etc).

2.02 *Do not* store photographic film within 15 feet of these tubes. Prolonged radiation can penetrate the packaging and expose the film.

3. HANDLING



Caution: Do not handle broken tubes if cuts or open sores are on exposed surfaces of hands, arms, or face. Any cuts caused by broken tubes shall be rinsed immediately with lots of cold water. Do not breath dust or vapors that may be released from a tube when it breaks.

3.01 If a broken tube is still in its socket, remove it with an appropriate tube extractor.

3.02 Do not touch broken parts with bare hands. Use a wet rag to pick up the broken parts. Leave all the parts in the rag and wrap and tie it securely to form a package. Dispose of it in normal public trash disposal system.

3.03 After the packaging is done, wash the hands with detergent soap and lukewarm water, and rinse thoroughly. Do this *three times*.

3.04 Where a defective tube is not broken, remove it with an appropriate tube extractor and dispose of it as covered in Part 4.

3.05 Good tubes that are superseded by a different type tube should be handled as unbroken, defective tubes.

4. DISPOSAL

4.01 *Do not destroy or mutilate glass envelopes or base pins of electron tubes.*

(a) Tubes to be disposed of shall be returned to Western Electric (WE) for final disposition. If disposable tubes are being accumulated for shipping in quantity, they should be stored, meanwhile, as covered in Part 2.

(b) For shipment, tubes shall be wrapped separately from other items and plainly labeled to indicate the contents.

Parcel Post Shipments

(c) Limited quantities of tubes may be shipped by Parcel Post. No more than six electron tubes of the types listed in Table A containing radium bromide shall be packaged in an individual container.

(d) Any package containing these tubes sent by Parcel Post shall bear the following precaution (which may be typewritten, hand printed, or rubber stamped on the package).

**RADIOACTIVE MATERIAL
GAMMA RADIATION AT SURFACE OF
PARCEL
LESS THAN 10 MILLIROENTGENS FOR
24 HOURS
NO SIGNIFICANT ALPHA, BETA, OR
NEUTRON RADIATION**

Express Shipments

(e) Tubes returned by express are exempt from specification packaging, marking, and labeling if the following conditions are met:

(1) Radioactive materials are securely contained within the devices, or are securely packaged in strong, tight packages, so that there will be no leakage of radioactive materials under conditions normally incident to transportation.

(2) No more than ten tubes should be included in any one package, and the package should be such that each tube is at least 6 inches from the surface of the package.

(3) There must be no significant removable radioactive surface contamination on the exterior of the package.

(4) The outside of the package should contain the words

**“Radioactive Devices”
“No Label Required”**